BUCKEYE YARD AND GARDEN LINE 2015-11
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From: Amy Stone (Lead editor and contributing author) and Pam Bennett (Co-editor and contributing author).

Pam Bennett, Joe Boggs, Jim Chatfield, Julie Crook, Erik Draper, Denise Johnson, Jaqueline Kowalski, Ashley Kulhanek, Cindy Meyer, Amy Stone, Nancy Taylor, Marne Titchenell and Curtis E. Young (Contributing authors).

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This is the 11th 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/makeaqgift/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 - ZINNIA (Zinnia hybrids). Zinnias are still quite popular annuals for Ohio gardens, especially with the introduction of cultivars that tend to be less susceptible to powdery mildew and leaf spot diseases. There are around 20 species of zinnias but only a few are cultivated for garden use. Zinnia elegans or common zinnia, was used in early gardens for cut flowers because of the stem height and large flowers. The downside to this group is their susceptibility to powdery mildew. The upside is that they are extremely easy to grow from seed.

Many of today's hybrids have been developed with disease resistance in mind. The 'Profusion' and 'Zahara' cultivars have performed quite well in past years in the field trials at the Gateway Learning Gardens in Springfield, Ohio. Very little leaf spot and no powdery mildew have been observed.

Zinnias tolerate full hot sun and are very drought tolerant. In fact, the hotter and drier the weather, the better the chances of avoiding diseases mentioned above. In addition, provide adequate spacing with the plants to allow for good air circulation. Heights of the hybrids are anywhere from 1' - 3' and are equally as wide. Many of the newer hybrids keep blooming all season and don't require deadheading. The blooms start in the early spring and are red, yellow, cream, pink, orange and scarlet. Zinnia blooms are also very attractive to butterflies. **Author: Pamela J. Bennett; bennett.27@osu.edu**

*PERENNIAL - ASIATIC LILIES - (Lilium spp. and hybrids). These showy plants are in full bloom at this time in central Ohio gardens. And when they flower, look out! You can't help but say "wow" when you see some of the cultivars that are quite bold and visible in the garden. Lilies are classified into 8 major groups based primarily on flower form and orientation. The Asiatic lilies are in Division 1 and have upward, outward or downward facing flowers on stems anywhere from 2 - 7' tall. They are usually non-fragrant and bloom in early summer. Oriental lilies are in Division 7 and are generally fragrant with bowl-like or flat-shaped flowers that bloom in mid- to late summer. The Missouri Botanical Garden Kemper Center for Home Gardening has a listing of the different divisions and their habits: [http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=a462](http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=a462)

Lilies are grown from true bulbs and are quite easy to grow. Plant them in well-drained soil; they do not tolerate wet areas. Lilies prefer to be planted in full sun but if the roots are shaded, they tend to thrive; a light layer of mulch helps to keep the roots cool as well.

If you don't like the appearance of the foliage once the blooms are finished, interplanted lilies with other perennials. The others hide the foliage as well as provide shade for the roots. In addition, once the
petals fall, trim the lily back to the top of the foliage but leave the foliage until it turns yellow (sometime in the fall). The foliage actually has nice texture that can be used as an attractive feature in the garden. 

Author: Pamela J. Bennett; bennett.27@osu.edu

*WOODY - SILVER LINDEN (*Tilia tomentosa*). This medium-sized tree is used as a shade, specimen or street tree. Its pyramidal growth habit when young opens to an oval canopy with age. At maturity, the silver linden grows to around 50' tall. The leaves are dark green on the upper surface and a wonderful silvery color on the underside. When the wind blows, the silvery shimmery affect is a great garden feature. The silver linden has very few pest problems and also appears to be less susceptible to Japanese beetle feeding injury. It is also moderately tolerant of soil compaction, drought, heat, and pollution. Author: Amy Stone, stone.91@osu.edu

*VEGETABLE – OKRA (*Abelmoschus esculentus*). Okra is a tall-growing, warm-season, annual vegetable that belongs to the Mallow family. Also included in the Mallow family are cotton, hollyhock, rose-of-Sharon and hibiscus. Okra is referred to as lady fingers or gumbo in other areas of the world. The immature young seed pods are the edible part of this plant and are used for soups, canning and stews or as a fried or boiled vegetable. The hibiscus-like flowers blooming on the upright plant (3 - 8' or more in height) also have ornamental value for backyard gardens.

Okra grows in any well drained good garden soil. Seeds should be planted after the soil has warmed in the spring, at least 7 - 10 days after the last frost date for your area. To accelerate germination the seeds may be soaked in water at room temperature overnight. The seeds should be sown 1” deep in hills 12 - 24” apart. Thin all but the strongest plant per hill when the seedlings are 3” tall. Shallow cultivation near the plants will help keep down weeds.

Harvest the okra pods 4 - 7 days after the flowers open. The pods should be cut while they are tender and free of fiber, 2 - 4” long for most varieties. Harvest every other day as the pods go rapidly from tender to tough with increased size. When the stem is difficult to cut, the pod is probably too mature to use. Remove these pods and discard as they reduce the plant’s production capability. The plant will continue to grow and produce pods until frost. Author: Julie S. Crook; crook.46@osu.edu

*WEED - CANADA THISTLE (*Cirsium arvense*). The flask-shaped lavender flower heads of this non-native noxious weed are beginning to appear in landscapes, fallow ground and along roadways in Ohio. The fluffy seeds (achenes) that are a characteristic of this and other members of the Aster family (*Asteraceae*), such as dandelion, soon follow. Seed wafting on a breeze is not the only way this aggressive perennial weed spreads. Plants produce creeping roots with vegetative nodes that give rise to new plants. Canada thistle is seldom found as a single plant; rather it forms clonal colonies and aggressively spreads outward from a point of introduction. Since plants are either male or female (dioecious), the circular patches are often one sex.

Canada thistle is native to Europe and Asia, not Canada, which is why it is not called "Canadian" thistle. It has been widely distributed throughout the world and it is now found in 37 countries including Canada and the U.S. Plants grow 2 - 5’ in height depending on environmental conditions. The deeply lobed 3 - 8” long oblong leaves are alternate on the stem. They have spiny, crinkled edges and end in a sharp spine. The stems are slightly grooved and become hairy with age.

Control of Canada thistle is challenging owing to its habit of quickly dominating its location and ability to sprout new plants from root nodes. Indeed, cutting the roots by digging or tilling only stimulates the growth of more plants. The best way to manage this opportunistic weed is to avoid allowing plants to establish in the first place. Canada thistle will quickly establish on bare soil in landscapes such in thinly mulched or mulch-free areas and in perennial or annual beds weakened by pest and disease problems (see Disease Digest below). Established Canada thistle plants may be eliminated over time by forcing plants to use-up stored nutrients through repeated cutting, mowing and/or tilling, coupled with applications of systemic herbicides.
Canada thistle does have a few natural enemies. The annual holey-handiwork of the THISTLE TORTOISE BEETLE (Cassida rubiginosa) usually appears on plants in early summer with adults and larvae chewing multiple holes in leaves to produce see-through leaves. The bacterium, Pseudomonas syringae pv. tagetis, creates "bleached tips" on plants later in the season by producing a chemical called tagetitoxin that is a RNA polymerase III inhibitor that blocks the production of chloroplasts. Unfortunately, while the work of these natural enemies may reduce thistle plant density, they do not eliminate seed production. **Author: Joe Boggs; boggs.47@osu.edu**

2. HORT SHORTS.

A. CHECKING HIGH TUNNEL TOMATOES. Erik Draper reported going to a high tunnel tomato greenhouse to check out concerns expressed about "spotted tomatoes." Erik was surprised to discover the tomato fruits were not spotted, but instead the leaves had a scattering of yellow spots on them! The spots turned out to be a fungal disease called TOMATO LEAF MOLD, caused by the pathogen, *Fulvia fulva* (synonym *Cladosporium fulvum*). This fungus only affects tomatoes and is most often a problem on high-tunnel or greenhouse tomatoes and occasionally appears in field production. Leaf mold symptoms first appear as randomly scattered, light-green or yellowish spots developing on upper surface of older leaves. On the underside of the leaf, these spots appear velvet-like and begin as an off-color tan, eventually maturing to a dark, olive-brown. As the disease progresses, multiple lesions on leaves cause the leaves to progressively turn yellowish-brown, wilt, desiccate and then drop off prematurely.

These lesions produce large numbers of spores on the underside of infected leaves, and these spores are easily spread to other plants via air currents, splashing water, tools and even clothes! In order to germinate, spores need conditions of high humidity (above 85%) or wet plant surfaces and temperatures between 40 - 94F, with optimum temperatures being between 75 - 78F. Most infections occur through leaf stomata and symptoms may appear approximately 10 days after inoculation, with spore formation beginning a few days thereafter.

This fungus survives on contaminated seed and serves as the primary source of inoculum. It can also overwinter saprophytically on crop debris, as sclerotia and/or conidia (spores), which may persist in the soil for about one year. The best approach to controlling this fungus is to minimize leaf wetness by avoiding overhead watering of foliage, moving stagnant air with circulating fans, staking up plants and trying to maintain adequate plant and row spacing. When tomato leaf mold has been a problem, all plant material should be removed and destroyed at the end of the season and the high tunnel/greenhouse disinfected. **Author: Erik Draper, draper.15@osu.edu**

B. A WALK ON THE WILDSIDE: TINY FROGS AND TOADS. It is not at all uncommon to encounter tiny, newly metamorphosed frogs and toads hopping about yards this time of year. Tiny miniatures of SPRING PEEPERS (*Pseudacris crucifer*), GRAY TREEFROGS (*Hyla versicolor*) and AMERICAN TOADS (*Anaxyrus americanus*) have been spotted in central Ohio. It’s likely that all across Ohio, homeowners are encountering these juvenile hoppers while mowing, weeding and tending the gardens and flowerbeds around the home. These miniature frogs are actually newly metamorphosed juveniles that will grow to the size of adult frogs and toads (though peepers won’t get much bigger when fully grown, they are only the size of your thumb nail) over the years. Homeowners are encountering these frogs and toads as they are dispersing from the waters they were born in. Usually, with a little patience on the part of the homeowner, the frenzy of frogs and toads declines in a couple weeks’ time as the young amphibians migrate on and disperse to find their own, individual spaces. For more information on these tiny amphibians, see BYGL 2013 - 15 (07/11/13). **Author: Marne Titchenell, titchenell.4@osu.edu**

C. A WALK ON THE WILDSIDE: BABY BIRDS ABOUND! Many of Ohio’s songbirds are well into their nesting season and are already giving young baby birds ‘the boot’ out of the nest. When a young bird is ready to leave the nest, it is called a fledgling. The act of leaving the nest is called fledging. Because many birds are completing their first (and for some only) nesting cycle, homeowners may encounter baby birds around their homes and yards. These baby birds are easily recognized as juveniles; they may
appear a little unsteady on their feet and off balanced in flight. They may also have several downy feathers sticking this way and that, and squinty eyes. All and all, their appearance often leads the well-meaning homeowner to want to help the young birds. Despite appearances, these young birds are mature enough to leave the nest and with the help of mom and dad (who are often nearby) will do just fine on their own. Though sometimes, a young bird that is NOT ready to be on its own (a nestling) will be found outside of the nest. How then do we know when to help the baby birds and when to leave them alone?

A fledgling will be hopping around, with its eyes open (though they may be squinty). A fledgling will also be completely feathered, with no bare skin showing, though some feathers may be downy or in disarray. A fledgling should also be able to perch (stand supported by its feet without help). As mentioned already, the parents of a fledgling are often nearby offering encouragement and protection. Some species, like bluebirds will stay with their parents for several weeks after fledging, learning how to forage for food as well as other life skills.

A nestling is a bird that is not ready to leave the nest. Nestlings will not be completely feathered, meaning there will be areas of bare skin and/or partially formed feathers. A bird that has completely closed eyes and unable to perch is also a nestling. Nestling birds should be placed back in the nest, if possible. Otherwise, put the nestling in a small container (Tupperware or old butter container) with some leaves and place it in a secure location as close to the nest as possible; for example, at the base of the tree or shrub where the nest is. Keep an eye on the nestling. If mom doesn't come to visit, call a licensed Ohio wildlife rehabilitator [http://go.osu.edu/WLrehab]. Author: Marne Titchenell, titchenell.4@osu.edu

D. A WALK ON THE WILDSIDE: PESKY SQUIRRELS IN THE GARDEN. BYGL writers Marne Titchenell, Pam Bennett and Denise Johnson have all received questions on how to rid gardens of pesky squirrels eating tomatoes and other veggies. Unfortunately, squirrels are not an easy critter to get rid of, especially if other habitat features exist in the area, namely mature, hard mast producing trees (oaks, hickories and walnuts). There are, however, several management recommendations that may provide relief to homeowner raging battle with squirrels.

Ohio is home to 4 species of tree squirrels, the EASTERN FOX SQUIRREL (Sciurus niger), EASTERN GRAY SQUIRREL (Sciurus carolinensis), RED SQUIRREL (Tamiasciurus hudsonicus) and SOUTHERN FLYING SQUIRREL (Glaucomys volans). Because of their frequency in urban areas, people are most familiar with the bushy-tailed eastern fox and eastern gray squirrels. Fox squirrels are the largest of all Ohio squirrels, weighing 25 - 30 oz., and measuring 20 - 23” not including the tail. Fox squirrels are brownish-red in color with a mix of black and gray streaking their fur. Their face, feet and undersides are a dull, creamy orange. Eastern gray squirrels, true to their name, are gray with silver-tipped hairs and cream colored undersides. Eastern gray squirrels measure roughly 17 - 20” in length and weight 12 - 25 oz. Red squirrels are distinguished by their red pelage, white undersides and white eye ring. Red squirrels are most common in deciduous and coniferous forests, and are smaller than the eastern gray or eastern fox squirrel. The nocturnal, gliding southern flying squirrel prefers larger tracts of mature forest; however in recent years this species is becoming more common in urban areas. It is the smallest of Ohio’s tree squirrels and most frequently becomes a nuisance by entering homes. But that is an article for another day!

The eastern fox and eastern gray squirrel are the most common culprits of damage in the landscape and garden. Because squirrels are rodents, they have 2 pairs of sharp incisors on the upper and low jaw that are constantly growing. These teeth will leave neat, clipped edges on the plants they are feeding on and teeth marks are often apparent. Be sure to always identify damage to the correct species before employing management options.

Tree squirrel damage can be minimized using several management options including trapping, use of repellents and exclusion. Squirrels can be removed from the landscape using a live trap. Traps should measure a minimum of 5” x 5” x 18” and be baited with a mix of peanut butter and oatmeal, other
nutmeats or sunflowers. Locate traps along routes commonly traversed by squirrels. A trapped squirrel can be released onto land outside of the city, village or township where the squirrel was trapped; however the permission of the property owner where the squirrel will be released must be obtained prior to the release. Landowners also have the option of euthanizing a live trapped squirrel that is causing damage on their property. Excluding tree squirrels from gardens is difficult short of constructing a cage-like enclosure. A 2 - 3' tall fence with a strand of electric wire along the top can be affective against climbing tree squirrels. Fences should be constructed out of galvanized wire with 1/2' mesh and buried 6" below the ground. Hot pepper repellents can be used in gardens to prevent squirrels from feeding on vegetables. Be sure to read the label on the repellent as some hot pepper repellents are not food safe.

E. A WALK ON THE WILDSIDE: EASTERN CHIPMUNKS (Tamias striatus). These are ground dwelling squirrels that inhabit mature woodlands and woodland edges, as well as urban areas around buildings and homes. Weighing in at 2 - 4 oz., the 5 - 6" long chipmunk is reddish to grayish brown with 5 dark stripes running down its back. Chipmunks are most active mid-morning to mid-afternoon, busy foraging for food or excavating a series of interconnected galleries and tunnels below the soil surface. Entrances to a chipmunk's tunnel are denoted by a hole 2" in width and appear very neat as chipmunks do not leave a mound of soil around the entrance. Chipmunk tunnels are often near buildings, garages or objects, such as stumps, wood or rock piles. These extensive tunnels and nearby feeding activity are the most common complaints of chipmunk damage. Tooth marks are typically evident in partially eaten fruit and vegetables and can help to identify the culprit.

Nuisance chipmunks in the garden can be managed using trapping, repellents and habitat modification. Habitat modification as a management option involves identifying the component of habitat (water, food, shelter, and space) that is attracting the nuisance animal, then modifying or eliminating that component. In the case of chipmunks, it could be a food source such as bird feeders. Use feeders that catch fallen seed, thus preventing a food source for ground foraging chipmunks. When shelter is the attractant, refrain from keeping piles of wood or rocks close to the foundation of a building where tunnel entrances can easily be hidden. Trees, shrubs and other landscape features that connect woodlands to home in a corridor-like fashion should be separated and spaced out. This may also help to deter tree squirrels.

Hot pepper repellents can be used to deter chipmunks in much the same way they can be used to deter squirrels. Remember to check the label of commercial repellents for a list of approved animal species the repellent can be used against. Lethal control using rat-sized snap traps or live traps followed by euthanasia is also a management option for chipmunks. At times, trapping may be the most practical method for nuisance chipmunks around the home and in landscapes less than an acre. Live traps should be at least 3" x 3" x 10" in size with a 1/4" mesh and baited with a combination of peanut butter and oatmeal. Pieces of vegetable, fruit or sunflower seeds glued to the trap trigger can also be used. Set traps in areas where feeding damage is occurring or near tunnel entrances.

Managing wildlife damage is not always easy, especially when it comes to squirrels and chipmunks. It often takes persistence and patience on the part of the homeowner, or in this case, the gardener. Using multiple management options at once is better than using just one at a time (i.e. trapping and repellents). Good luck!  **Author: Marne Titchenell, titchenell.4@osu.edu**

F. POLLINATORS IN THE GARDEN. June 15 - 21, 2015 has been designated National Pollinator Week by the U.S. Department of Agriculture; this is a great time to think about how to attract more pollinators to our gardens. Pollinators are necessary for the production of many food crops and provide a vital service to the survival of many native plants. We can thank pollinators for one in three mouthfuls of food and drink – from coffee and chocolate to most fruits and many vegetables we eat. Choosing plants that provide the necessary habitat and food sources for birds, bats, butterflies, moths, beetles, wasps, small mammals and most importantly bees can increase the number of pollinators in your garden.

Bees are considered the most important pollinators. They actively collect and transport pollen. Bees forage for pollen, travelling from flower to flower of the same species. This ensures pollination of the
Bees regularly forage in areas around their nest which also helps to ensure that flowers are pollinated. Honey bees are the most reliable agricultural pollinator of many crops. It is native to Europe, western Asia and Africa. Ohio has approximately 500 native bee species. These native bees also play an important role as pollinators of agricultural crops and native plants.

Gardeners can encourage more pollinators by planting a diverse selection of flowers, and being sure to have different flower shapes and colors that will appeal to a variety of pollinators. Varying plant heights and growth habits also adds to garden diversity. Offer a continual source of food/flowers throughout the growing season. Bees benefit from early blooming flowers such as maples and redbuds to provide a food source in spring, just when they emerge from winter. Purple coneflower, milkweed and hyssop, mid-season bloomers, can provide a food source in the heat of summer. Late season perennials such as asters and goldenrod provide food to help pollinators make a healthy transition to winter. Most pollinator friendly plants prefer full sun. Group these plants together to help pollinators find and feed on the necessary flowers.

There are an abundance of plants that will provide the necessary sources of pollen and nectar for pollinators. The Pollinator Partnership offers different planting guides to improve pollinator habitat, each one tailored to a specific ecoregion in the United States. Each guide is filled with native plant and pollinator information. The free planting guide for Ohio can be downloaded here [http://pollinator.org/PDFs/Guides/EBFContinentalrx13FINAL.pdf]. The Xerces Society also has a pollinator planting guide that can be downloaded here [http://www.xerces.org/wp-content/uploads/2014/09/MidwestPlantList_web.pdf].

Additional steps you can take to encourage more pollinators in your garden:
- Provide nesting sites by leaving some ground undisturbed or untilled, by providing nesting tubes or leaving dead plants in your yard.
- Reduce pesticide use.
- Provide a water source for pollinators in the garden especially during the heat of the summer. A shallow bowl or birdbath can provide adequate water.

Author: Julie S. Crook; crook.46@osu.edu

3. BUGBYTES.

A. HICKORY TUSSOCK MOTH. Curtis Young reported that he observed recently hatched first instar hickory tussock moth (Lophocampa caryae) caterpillars commencing their side-by-side feeding activity on oak leaves in northwest Ohio. First instars feed gregariously in colonies as leaf skeletonizers; the appearance of "see through" leaves is a good indicator the caterpillars are afoot. The caterpillars eventually disperse with later instars becoming solitary feeders and consuming entire leaves.

Hickory tussock moth caterpillars may be found on a wide range of deciduous trees and shrubs including ash, crabapples, elms, sweetgum and their namesake host. However, despite their common name, the caterpillars are most often found in Ohio on both white and red oaks. As with all tussock moths, the caterpillars are protected by stinging (urticating) hairs. Direct contact with skin can produce a rash similar to reactions to poison ivy on people who are sensitive to the caterpillar's "touch."

Although larvae of all instar stages are covered with stiff white hairs, there are different color forms. All color forms are variations of a black on white motif and range from thin black stripes across the back (tiger striping) to a row of black spots down the back. Most color forms also have two prominent side-by-side tufts of long black hairs immediately behind the head which is typical for a tussock moth caterpillar. In past years, these caterpillars have been responsible for heavy defoliation of oaks in southern Ohio. It is suspected that the hickory tussock moth has two generations per year in Ohio.

Author: Joe Boggs, boggs.47@osu.edu
B. HIGH LACE BUG POPULATIONS. In two previous BYGL reports (BYGL 2015-07, 05/21/15; BYGL 2015-08, 05/28/15), we noted that several species of lace bugs were apparently very successful with overwintering and high populations were producing large numbers of eggs. The lace bug species included: BASSWOOD LACE BUGS (*Gargaphia tiliae*), HAWTHORN LACE BUGS (*Corythucha cydoniae*), OAK LACE BUGS (*C. arcuata*) and SYCAMORE LACE BUGS (*C. incurvata*). This week, Curtis Young reported that he is already seeing noticeable damage from hawthorn lace bugs on their namesake host in northwest Ohio and Joe Boggs noted that damage from basswood lace bugs, oak lace bugs and sycamore lace bugs is becoming evident in the southwest part of the state.

These lace bug species live on the undersides of leaves where they use their piercing/sucking mouthparts to suck juices from their host plants. As with all lace bugs, their feeding produces tiny yellow or whitish leaf spots (stippling) that may coalesce to produce large, yellow-to-copper colored areas on leaves, and early leaf drop. It is not unusual for early feeding symptoms of basswood, hawthorn and oak lace bugs to appear as distinct 1/4 - 1/2" diameter spots on the upper leaf surface. It is speculated that the circular stippling pattern is produced by nymphs feeding around egg clusters. Lace bugs also deposit unsightly hard, tar-like spots of excrement onto the leaf surface as they feed. Most lace bugs have multiple generations per season; their damage builds with each succeeding crop of new bugs.

Basswood lace bugs may be found on all members of the *Tilia* genus in Ohio; however, they have a particularly affinity for silver linden (*T. tomentosa*). Oak lace bugs may be found on both red and white oaks. Hawthorn lace bugs have a more cosmopolitan palate and will feast on a variety of rosaceous plants as well as a few plants outside of the rose family. They are commonly observed on hawthorn as well as *Cotoneaster* sp. and *Amelanchier* sp. Lace bug leaf feeding damage seldom causes significant harm to the overall health of established trees; however, the stress associated heavy lace bug feeding activity on newly planted trees may make young trees susceptible to other pest problems such as borer infestations. Thus, it's important to monitor young trees and apply corrective insecticide treatments if necessary. **Author:** Joe Boggs; boggs.47@osu.edu

C. CORRUGATED BIRCH LEAVES. Amy Stone reported observing the unusual handiwork of the SPINY WITCHHAZEL GALL APHID (*Hamamelistes spinosus*) on river birch (*Betula nigra*) in northwest Ohio. The aphid produces raised ribs or "corrugations" on the upper leaf surface that match deep furrows between the veins on the lower leaf surface where the aphids live. The aphid has a complex life cycle that involves two required hosts: witchhazel (*Hamamelis* spp.) and river birch. Winter is spent either as eggs on witchhazel bark or as immature female aphids under birch bark.

The aphid is sometimes called the "river birch aphid" owing to its common occurrence and noticeable damage on this required alternate host. On birch, the females move to newly expanding leaves in the spring where they feed, mature and give birth to a new crop of aphids. Aphid numbers expand quickly with each succeeding generation contributing to an ever-expanding aphid population. The feeding damage on birch causes the expanding leaves to pucker and bulge length-wise producing the characteristic leaf corrugations. The aphids cover themselves in a waxy, white, flocculent material and live on the underside of the leaves within the corrugations. The affected leaves usually turn yellow and may prematurely fall off of the tree.

Eventually, the aphids on birch produce winged females that fly to witchhazel. They lay eggs on the bark that will hatch into "stem mothers" the following spring. The stem mothers feed on newly expanding buds and inject chemicals that cause the buds to form a hollow, spiny, globular gall around their progeny. The winged aphids arising from the witchhazel galls fly back to birch.

Damage to both plant hosts is usually not severe enough to warrant treatment, particularly on witchhazel where the galls have no impact on plant health. Frequently, numerous predators will destroy aphid populations on the birch leaves. However, if heavy infestations on birch occur on highly visible plants, aphid populations can be reduced with a fall soil drench application of imidacloprid, or a spring topical application of acephate or insecticidal soap. **Author:** Joe Boggs; boggs.47@osu.edu
D. BACKYARD FLASHERS. Several BYGLers reported observing impressive nighttime flashing displays by LIGHTNING BEETLES (Family Lampyridae) in landscapes, forests and fields across Ohio. Although commonly called lightningbugs and fireflies, they are neither bugs (order Hemiptera) nor flies (order Diptera); they are beetles (order Coleoptera). There are over 2,000 species of lightning beetles worldwide and about 170 species are found in North America with most occurring east of the Mississippi. Lightning beetles are a joy of summer, delightful to look at, and fun to catch!

The beetles are usually a little over 1/2” long, elongate, and very soft-bodied. The shield-like structure behind the head (pronotum) extends forward over the head and largely conceals the head when viewed from above. The reddish pronotum has a black spot in the center. The brownish-black wing covers (elytra) are trimmed in yellow except at the front. The lower end of the abdomen is yellowish-green and it is in these "taillight" segments where the flashing bioluminescence occurs.

Females deposit their eggs on or just below the soil surface. The resulting larvae have prominently segmented bodies and they also possess bioluminescent organs located in tiny spots on the underside of their bodies. The soft, greenish-white glow emitted from these organs gives rise to the common name of "glowworms." However, this common name is also applied to the wingless females of some lightning beetle species. The larvae are predaceous and are particularly fond of slugs and snails, but they will also eat smaller insects and the eggs of insects and other invertebrates. The feeding habits of the adults vary with the species. Some species of lightning beetles feed on plant pollen or nectar, others don't feed at all, and females of some species prey upon the males of other species.

The glowing bioluminescent light emitted by the adults and larvae is truly one of the marvels of nature. These beetles are capable of producing light without heat; the complex cascading chemical reactions that produce the bioluminescence is 100% efficient. While lightning beetles aren't the only bioluminescent organisms, they are certainly one of the best known.

The bioluminescence serves several purposes including warning defense, mate location, and for some species, food attraction. Both the adults and larvae contain chemicals the make them unappetizing to some predators; just smell your hand after handling a lightning beetle. So, their glowing lights are like flashing "you shouldn't eat me" signs. Mate location involves Morse Code-like flashing patterns between the flying males and females of the same species that are usually found sitting on plants. The males emit a series of flashes unique to the species and females respond with their own unique flashing pattern to vector the flying males in for a nighttime rendezvous.

For some males, the consummation of their love flight is not what had in their little lightning beetle minds. Females in the genus Photuris are predators and they feast on the males of other species. The femme fatale females mimic the flashing patterns used by the females of other species; they flash a "come hither" signal to lure the males to their doom. Interestingly, the ill-fated males may sometimes demonstrate a final use of their bioluminescent capability; as a warning signal. Lightning beetles caught in a spider web or the clutches of a ravenous Photuris female will emit a series of close-spaced flashes which presumably translate into, "don't go towards the light!"  

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

* Joe Boggs reported observing his first JAPANESE BEETLE (Popillia japonica) adults for the season in southwest Ohio. The game is afoot! Joe noted that he only found a few beetles feeding on black willow leaves. Oddly, he could not find any adults on wild grape growing nearby; however, BYGLers agreed that it was just a matter of time. These early-bird beetles typically represent just the tip of the iceberg with numbers gradually climbing as the season progresses. Author: Joe Boggs; boggs.47@osu.edu
Curtis Young noted that adult PINE SPITTLEBUGS (*Aphrophora parallella*) are beginning to emerge from the frothy, spittle-like masses created by the nymphs. Adult spittlebugs (family Cercopidae) are called "froghoppers" owing to their blunt, wedge-shaped bodies which give them a frog-like appearance. The adults feed as sucking insects but cause little damage; they do not create frothy masses. Eggs are laid in dead or live stem tissue and will hatch next spring to initiate a new round of nymphs covered in spittle-like masses. 

Author: Joe Boggs; boggs.47@osu.edu

Marne Titchenell reported observing the handiwork of the WITCHHAZEL CONE GALL APHID (*Hormaphis hamamelidis*) on its namesake host in central Ohio. The descriptively-named galls rise from the upper leaf surface; they are at first light green but eventually turn deep red. Opening the developing galls will reveal either a single, greenish-white, "stem mother" that directs gall development and is eventually enveloped by the gall, or large numbers of similar looking progeny that were produced asexually by the stem mother. The aphid has a complicated life-cycle involving multiple generations; however, it apparently focuses its entire attention on witchhazel which is unlike the aforementioned spiny witchhazel aphid (*Hamamelistes spinosus*) (a.k.a. river birch aphid). The cone gall aphid only affects plant aesthetics; it causes no appreciable harm to the overall health of its witchhazel host. 

Author: Joe Boggs, boggs.47@osu.edu

4. DISEASE DIGEST.

A. VOLUTELLA LEAF BLIGHT AND STEM CANKER OF PACHYSANDRA. Joe Boggs shared images of this common fungal disease of Japanese pachysandra (*Pachysandra terminalis*) showing its three faces in a commercial landscape in southwest Ohio. The disease is produced by the fungus, *Volutella pachysandricola*. The first noticeable symptom is usually an obvious irregular blotch-like leaf lesion that consists of concentric dark and light brown rings; a leaf lesion characteristic that is described as "zonate." Parting the affected leaves may reveal the second symptom: blackened, collapsed stems produced by stem cankers. Orangish-pick spore masses of the fungus may be revealed by holding infected stems for a few days in a plastic bag with a slightly moistened paper towel.

Heavy stem dieback caused by the cankers will eventually produce the third symptom of this disease: irregular patches of dead, defoliated plants in pachysandra beds. The plant die-off may open the beds to weed infestations. Joe showed images of a pachysandra bed with Canada thistle (*Cirsium arvense*) rising from openings in the bed produced by the disease. Thus, the proper management of this disease should be considered an important part of an effective weed management program in pachysandra beds (see Weed of the Week, Canada Thistle above).

Effectively managing Volutella leaf blight and stem canker requires a multi-tiered approach with particular attention given to cultural management. The fungus is generally considered to be an opportunistic pathogen meaning that it usually infects weakened or stressed plants. So, the first step in an effective disease management is to enhance plant health by planting pachysandra in appropriate sites and following proper water and fertility programs. For example, Joe’s images showed the heavily infected plants were in beds exposed to full sun; not a good site for a shade-loving plant.

Although dense pachysandra beds are a beautiful landscape feature, poor air circulation within the dense plantings may support heavy fungal infections. Cutting plants in early spring to just above the crowns every 3 - 4 years, and removing the debris, will promote healthy regrowth and will help keep infections in check by removing infected stems and leaves. A rotary bagging mower set to its highest cutting height is a helpful tool for accomplishing this periodical "renovation" of pachysandra beds. Mowing combined with raking can be helpful in responding to infections with particular care given to making certain all of the infectious plant debris is removed from the bed. Fungicidal applications may provide some suppression of this disease; however, fungicidal applications alone will not eliminate the disease from pachysandra beds. New growth must be targeted meaning that multiple applications are required because pachysandra produces new growth throughout the growing season. 

Author: Joe Boggs; boggs.47@osu.edu
B. OAK LEAF BLISTER. Oak leaf blister symptoms are becoming evident in southwest Ohio on the namesake host of this fungal disease. The leaf disease is caused by the fungus, *Taphrina caerulescens*. The fungus overwinters in infected buds and twigs. Leaf infections occur during moist periods in the spring as leaves emerge. Early symptoms appear as raised, blister-like, light-green to yellowish-green spots on the upper leaf surface matched with deep depressions on the lower leaf surface. Eventually, the leaf “blisters” become very apparent as they turn dark brown to brownish-black. The blisters may be evenly distributed across the leaf and are distinct from the angular, vein-based symptoms produced by oak anthracnose.

Although the obvious blisters may reduce the aesthetic appeal of heavily infected trees, the disease typically causes little harm to the overall health of the trees. Even leaves with a relatively large number of infections will retain a significant percentage of functional tissue for photosynthesis. Thus, control measures are generally not required. *Author: Joe Boggs; boggs.47@osu.edu*

C. MOIST CHAMBER. Nancy Tayler reported that several plant diseases were confirmed last week by the C. Wayne Ellett Plant and Pest Diagnostic Clinic (CWEPPDC). These included: VERTICILLIUM WILT of lilac in a landscape and pepper plants in a home garden; DUTCH ELM DISEASE of slippery elm; OAK WILT; and IMPATIENS NECROTIC RING VIRUS (INRV) in its namesake host growing in a greenhouse. Despite its common name, the INRV virus may infect more than 648 plant species and is spread from plant to plant by thrips. For this reason, Nancy noted that INRV is most often a problem in greenhouse production. *Author: Joe Boggs; boggs.47@osu.edu*

5. TURF TIPS.

A. BIRDSFOOT TREFOIL FOILING THE APPEARANCE OF TURFGRASS. Birdsfoot trefoil (*Lotus corniculatus*) is a perennial, spreading, herbaceous legume native to Europe and Asia. It was introduced into North America for use as a forage crop harvested for hay or used in pastures. Plants can survive and thrive in a wide range of soil and environmental conditions that would limit the use of other forage crops such as alfalfa. However, in recent years, this tough plant has gradually moved from celebrated crop status to inglorious weed status in turfgrass and landscapes. Indeed, several BYGLers bemoaned the ever-expanding patches of yellow flowers currently foiling the appearance of home and commercial lawns in Ohio.

The bright yellow flowers are smaller than the flowers of dandelions, bigger than those of black medic and from a distance may look like buttercups. A closer inspection will reveal the flowers are sometimes tinged in red and grow in clusters of 5-10. They have the general appearance and structure that is shared with other members of the bean family, Fabaceae (previously Leguminosae). Heavy flowering occurs from mid-June throughout July and into August.

Birdsfoot trefoil spreads by seeding, underground rhizomes and above ground runners. Individual plants quickly spread to form a dense mat in both lawns and landscapes. Mowed plants will continue to spread along the ground; however, the plants will rise in between mowings to tower above the surrounding turfgrass. Plants may grow to a height of 20-40" in surrounding landscapes. Birdsfoot trefoil has 3 leaflets at the tip of the leaf and 2 stipules near the base of the petiole making it look like it has 5 leaflets. The plant gets its name from the very distinctive arrangement of seed pods; they resemble the foot of a bird.

Infestations of this non-native opportunistic weed in turfgrass is associated with openings in weakened lawns so management begins with maintaining thick, healthy turfgrass. This includes following proper fertilization and watering programs as well as cutting turfgrass high to support the development of healthy root systems. Fortunately, birdsfoot trefoil is susceptible to most post-emergent broadleaf herbicide products labeled for use on turfgrass; however, multiple applications may be required to exhaust regrowth from the rhizomes. *Author: Joe Boggs; boggs.47@osu.edu*

C. BASEBALL FIELD MANAGEMENT ONLINE COURSE OFFERED. Interested in wanting to learn more about what it takes to manage a baseball field? The course contains 7 modules which includes: Introduction & Field Layout; Infield Skins; Pitcher's Mound; Turfgrasses; Best Management Practices; Turf Problems; and Sports Turf Administration. Each module is stocked with short high quality lectures, “how-to” instructional videos, games and/or assignments. There are also tips from field managers. The course is assessed by quizzes. The student can learn from their chosen remote location and at their own pace.

For more information, go to the Plant Science Online Website at http://hcs.osu.edu/plantscienceonline/certificates/baseball

6. INDUSTRY INSIGHTS.

A. CALICO SCALE CRAWLERS SETTLE. Calico scale (Eulecanium cerasorum) 1st instar nymphs (crawlers) are on the move in northeast Ohio and have settled onto the undersides of leaves in the southwest part of the state. The tiny, tannish-brown, oblong-shaped crawlers are around 1/16" in length. Once settled, they are positioned along leaf veins where they insert their piercing-sucking mouthparts into phloem vessels to extract amino acids that are dissolved in the sugary plant sap. Like the maturing females earlier this season, the crawlers discharge excess sap from their anus in the form of sticky, sugary “honeydew.” Their honeydew production is usually not as dramatic as that which was produced by the maturing female scales; however, high crawler populations can emit enough honeydew to produce a sticky sheen on the leaves, stems, and branches of scale infested trees as well as understory plants. The resulting colonization of the honeydew by black sooty molds further adds to an unsightly appearance.

Based on the results of an insecticide efficacy trial conducted last season by Dan Herms (OSU Entomology) and Joe Boggs on honeylocust in the southwest part of the state, the settling of the crawlers on the leaves signals an opportunity to suppress calico scale populations. Summer crawlers attached to the underside of leaves were targeted using several products including contact insecticides (Onyx; bifenthrin) and a systemic insecticide (Safari; dinotefuran). Onyx provided the best suppression with 0.8% survival of the nymphs assessed 53 days after treatment compared to 63% on the untreated trees.

The common name for this non-native “soft” scale is derived from the appearance of the mature females earlier this season. Like all soft scale, the females were protected by a soft, helmet-like shell. The females measured around 1/4" in diameter and had a starkly contrasting calico pattern of black-and-white markings on their hemispherical-shaped shells. These females died after producing their eggs which gave rise to the current crop of crawlers. The dead females are currently reddish-brown and appear deflated. They will remain evident throughout the remainder of the season and may give the false impression that other control efforts were effective; however, landscape and nursery managers should be examining the leaves for the crawlers!

As fall approaches, the crawlers will move from the undersides of leaves back onto stems where they spend the winter. There is one generation per season. Calico scale can infest a wide variety of deciduous trees including dogwood, honeylocust, magnolia, ornamental fruit trees, sweetgum, and witchhazel. They are seldom a direct killer of established landscape trees; however, heavily infested trees may suffer branch dieback and the accumulated stress caused by substantial sap loss may cause infested trees to succumb to other stress related factors. Author: Joe Boggs; boggs.47@osu.edu

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 June 1 - 16, 2015, with the exception of the soil temperatures which are readings from Wednesday, June 17, 2015 at 5:05 p.m.

Rain, rain and more rain. This single word was reported by each BYGLer. Curtis won the award for the wettest weather report for the week. The Ada area in NW Ohio received between 6 - 8” from Saturday to Sunday, with additional rains predicted. Erik Draper reported receiving 4”+ over the weekend and Amy Stone reported receiving 3”+ in that same period with a similar forecast. This rain is on the heels of other storms and saturated soils in the NE and NW. Soil conditions in central and southern Ohio were dry prior to this week’s rain.

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<td>Ashtabula</td>
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<td>2.4”</td>
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<td>NE</td>
<td>79.3</td>
<td>59.4</td>
<td>2.26”</td>
<td>2.3”</td>
<td>71.10/71.55</td>
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<tr>
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<td>NW</td>
<td>79.3</td>
<td>59.1</td>
<td>3.47”</td>
<td>2.1”</td>
<td>69.30/70.87</td>
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<tr>
<td>Columbus</td>
<td>Central</td>
<td>82.0</td>
<td>61.8</td>
<td>2.11”</td>
<td>2.5”</td>
<td>76.75/76.89</td>
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<tr>
<td>Piketon</td>
<td>South</td>
<td>81.4</td>
<td>60.8</td>
<td>1.98”</td>
<td>1.6”</td>
<td>75.71/76.33</td>
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For a link to the OARDC Weather Stations, visit: [http://www.oardc.ohio-state.edu/centernet/weather.htm]  
Author: Amy Stone; stone.91@osu.edu

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 811 to 1,134. Following is a report of GDD for several locations around Ohio as of end of the day of June 17, 2015: Painesville, 811; Cleveland, 854; Toledo, 910; Canfield, 882; Findlay, 919; Van Wert, 935; Wooster, 926; Coshocton, 1,029; Columbus, 1,145; Springfield, 1,071; Dayton, 1,075; Cincinnati, 1,115; Ironton, 1,132; Portsmouth, 1,134; and Piketon, 1,120.

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.

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 budscale, egg hatch, 894; winterberry holly, full bloom, 897; panicked 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; panicked 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!

Author: Curtis E. Young; young.2@osu.edu

8. COMING ATTRACTIONS.

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

B. 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. Into each life some rain must fall. Henry Wadsworth Longfellow

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  
http://mastergardener.osu.edu

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

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

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

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

Following are the participants in the June 9th conference call: Pam Bennett (Clark); Joe Boggs (Hamilton); Julie Crook (Hamilton); Erik Draper (Geauga), Denise Johnson (Master Gardener Volunteer program); Amy Stone (Lucas); Nancy Taylor (C. Wayne Ellett Plant and Pest Diagnostic Clinic (CWEPPDC)); Marne Titchenell (School of Environment and Natural Resources) 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.

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