Crop Advisory Team

Alert

MICHIGAN STATE UNIVERSITY EXTENSION

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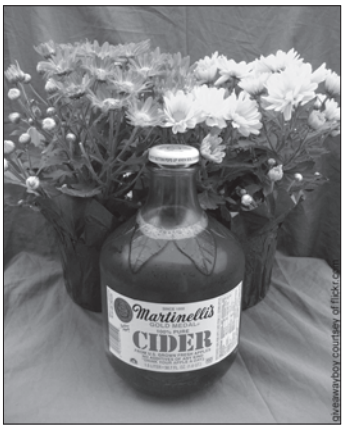
Landscape Alert



Last issue for 2009

This is the final issue for the 2009 season of the *Landscape Alert* newsletter. Included in this issue is an index of articles to help guide readers through the topics covered this year. Educators and specialists have worked hard to inform readers about current issues throughout the last few months.

We will continue to publish timely articles at the *Landscape Alert* web site: http://ipmnews.msu.edu/landscape. Interested in staying informed via email notification? Send an email to catalert@msu.edu with your full name and note that you wish to subscribe to the landscape edition. At the *Landscape Alert* web site, you can also sign up to received RSS feeds when new articles are posted. (See image.)

Look for a bright orange RSS feed logo on the right side of the web page.

We love to hear feedback from our readers. Do you have a comment or suggestion? Please send it to catalert@msu.edu or mail it to the address on the back of this newsletter. Indicate whether you are referring to our fruit, vegetable, field crop or landscape edition.

Thank you. - Joy Landis, editor and Andrea Buchholz, asst. editor

Update on the reports of upper branch dieback in Norway and sugar maples in Ann Arbor, Plymouth, and Canton

Dave Smitley, Entomology

In late May and June of this year several arborists from Ann Arbor and the western suburbs of Detroit reported seeing an usual number of Norway and sugar maples with a few too many upper branches that were dead, wilting or had stunted leaves. The affected branches were usually scattered about the crown among other relatively healthy branches. The branch dieback was usually observed on stressed street trees that were either old, growing in poor soil, or restricted by pavement. Symptoms appeared before water stress became an issue this year. After a *Landscape Alert* article on this problem, people from other parts of the state reported some similar observations, including Paul Schwarz, head arborist for MSU grounds.

When Bert Cregg and I looked at the maples on campus with Paul Schwarz, we noticed that the worst-looking trees tended to be on poor sites or to have some lower trunk damage. In some cases, we found signs of borer activity on the trunk or at the base of some branches. When we followed those branches up they were the same ones with dieback symptoms. We will be removing one or more of these trees to scrape branches and look for borers and fungal diseases.

At this point, we don't have any common cause for the scattered branch dieback observed on Norway and sugar maples this spring and summer. Some of the things to consider are drought stress, girdling roots, basal wounding, and trunk cracking, all of which can make trees more susceptible to attack from borers. *Verticillium* wilt is another common problem on maple trees, but the symptoms are not usually restricted to individual branches, and once *Verticillium* causes branch wilting, the entire tree often

dies within a year or two.

We are still investigating this problem, and we would appreciate any observations or thoughts that you have that will help us. Email me at smitley@msu.edu. Meanwhile, you may want to check the base of branches showing dieback (or the trunks of smaller trees, under 8" dbh), and look for sunken areas of bark, cracking, swelling, and emergence holes. If these symptoms are present, scrape the bark and look for borers.

Gerry Adams would also like to know if you see any *Armillaria* root rot on Norway and sugar maples with branch dieback. *Armillaria* root rot has killed some large old trees in other parts of the state, following multiple years of drought stress. However, these were not necessarily maple trees, and maple trees are not usually considered to be one of the more susceptible tree types. Contact him at gadams@msu.edu.

If we learn any more about this problem during the off-season, we will provide an update via the *Landscape Alert* on-line and in the first print version this spring. Thanks for sharing your observations. **IPM**

Climate may be the cause of the scorch, dieback and death of maples and other trees this year

Gerry Adams, Dept. Plant Pathology, MSU

MSU Diagnostic Services and several professors, campus arborists and others have had quite a struggle with diagnosing the cause of the many mysterious problems in maples that have appeared this year. Maples are not the only trees we are encountering with such problems though. Equally mysterious samples of damaged or dead spruce and oak have arrived for diagnosis. While we remain baffled by the lack of any pathogen or pest associated with the trees, I would propose to you that the cause for the tree problems may have occurred during the winter and left no visible trace in the trees. It will take some sophisticated work to support the ideas I present here and with the autumn approaching our time to test the hypothesis may have passed; therefore, this diagnosis will likely remain speculative, unfortunately.

There has been a long history in forestry of pathologists struggling with the causes of forest declines, and it is in this literature that we may encounter some answers to the maple problems. Maples and particularly sugar maples have shown recurring episodes of decline in forests which have been discussed since the 1940s. The causes of decline in sugar maple, oak and other species have been slowly worked over by studying associations of tree rings with climate and insect or fungal defoliators. Briefly stated (a difficult task for any old professor to do!), years of speculations and correlations have arrived at an understanding that defoliators, drought, root freezing, and root thaw-freeze cycles lead to individual trees declining and even dying. The most obvious symptoms expressed by affected trees include marked deterioration of the crown health. We do not appear to have a serious defoliator affecting the urban tree samples, so we must look to the other stressors for the hypothesis. However, in the forests in some parts of the state the forest tent caterpillar is doing serious damage that will likely result in some stress-induced mortality next year.

Stressed trees die slowly in many sites and situations. Studies have shown that trees exposed to severe drought generally separate into two classes in subsequent years, those that recover and those that begin to show decline in the crown health and reduced growth (basal area increment, BAI). This grouping of trees remains evident for many years and when a later moderate to severe drought episode occurs, the "declined" trees fail to recover when climate improves. They may show a steady state condition or exhibit a continued downward trend in health. The growth rate of these trees also can be profoundly affected by mild, short-term droughts.

From the standpoint of our large older landscape and forest trees, the severe drought of 1988 may still be taking a toll on their health and mild drought can have profound effects on them; drought where several months occur with less precipitation than historic averages. I believe that the more recent drought stress of the 2007 growing season may have triggered recent declines and mortality in this predisposed set of the "declined" trees. For the declining and dying maple and oak trees that have been sent to MSU for diagnosis, those reported to have begun showing scorched foliage and branch dieback the year or two years previously, I believe they are the "declined" set slowly exhibiting the effects of the 2007 drought (and root freeze, see below).

It is a hard concept for us to accept that long past stresses can kill trees without the additional attack by opportunistic pathogens or pests such as Armillaria root rot or bark beetles. However, we have been forced into speculating along the above theme because few of the dying maples and other trees showing damage this year have exhibited Armillaria root rot. Of course, some have, and when tree rings were examined in the Armillaria infected trees, it was evident that incremental growth had been greatly reduced for several years, not just this year. These trees all exhibited scorch-like symptoms on the leaves and dieback of the terminal tips of branches (new growth), and sometimes whole branch death, or entire tree death.

It is less hard to conceive of a single stress event causing dieback and death of trees, unless that single event occurred disjointed in time from the symptom expression. The thaw-freeze events of this past winter are just such an overlooked and somewhat forgotten event that would have taken a toll on tree health and initiated decline. The winter before, I believe also had an unusual number of thaw-freeze events that would have damaged roots. Root freezing may have been evident in some large scorched and dying oak trees we examined where the roots looked as

though they had been dead for many months yet did not have Armillaria root rot. In addition to the harsh thaw-freeze cycles of our recent winters and the documented effects of similar climate on forest sugar maple declines, this winter one of our thaw episodes was followed by an evening extreme drop of 30°F to record cold January temperatures. This particular freeze spell may be our primary causal agent in the maple scorch, dieback, and mortality that is so unusual and widespread this year. Maples have been experimentally shown to suffer greatly from such root freezes. Perhaps in those maples affected this year, the roots were in a shallow or other position conducive to freezing more so than unaffected trees of the same species or other species in the region.

One major after-effect of root freezing and the extreme cold drop in January was likely cavitations in the vascular system, the disruption of the water columns by ice formation. The breaking of the water capillaries by ice formation introduces air-pockets that disrupt the water flow in the trees. This disruption may not be repairable by the maple species during spring growth. The expected effects of cavitations would be similar to several of the symptoms that have been present in our damaged maples, including: leaf scorch, leaf drying and curling, shriveling of the terminal new twig growth, eventual branch dieback, and even tree death. Cavitations are essentially invisible under ordinary examination of plants during diagnostics. So ascribing blame to this mechanism comes about from the absence of other evident causes, for example, Verticillium wilt. None of the samples of maple scorch and branch dieback that I have examined yielded Verticillium during isolations. This has been an unexpected finding all year for the damaged maples, because stresses such as drought, almost always lead to increased incidences of Verticillium infection of maples, red buds, smoke trees and viburnums. Verticillium wilt also results in scorch-like leaf symptoms, branch dieback and occasionally tree death and these were the symptoms we were regularly seeing in diagnostic samples and in the field, yet lab tests showed the Verticillium wilt pathogen to be absent.

In conclusion, the hypothesis that root freezing, thaw-freeze cycles, and past drought stresses have resulted in trees exhibiting severe decline, dieback and even death seem to be supported by the symptoms expressed in maples and other species. In urban maples in particular, cavitations in the vascular system caused by the January thaw-extreme freeze episode seems a probable cause of the symptoms we are witnessing. However, as we university folk are famous for saying, more research is needed to verify our best assumptions. **IPM**

Points to ponder as you prepare nursery plants for winter protection

Thomas Dudek, MSU Extension West Central Region

Hardening plants or providing dormancy requires many conditions to occur all at the same time within the plant. Nursery practices like fertilizer applications, irrigation, pruning and light levels all contribute to how successful plants will overwinter and avoid winter injury.

Plants that have a balanced nutrient content overwinter better. Avoid fertilizing plants about six weeks before the average first frost date for your area. Be sure you choose the correct controlled release fertilizer so your plants have lower nutrient levels in the pots over the winter. Research has shown plants prefer higher potassium (K) levels going into the winter. High K promotes cell permeability that is important in avoiding cellular freeze injury. A foliar level of 50 to 75 ppm K is generally sufficient. Field grown plants having soil test levels above 50 lbs./A. is adequate.

Overwintered plants require moisture so be sure to provide enough water to allows some moisture to reach the bottom of the container. Check field stock for moisture availability because a dry September can cause fertilizer that was applied earlier to release when rains do occur causing a flush of new growth. Overwintered nursery stock survival

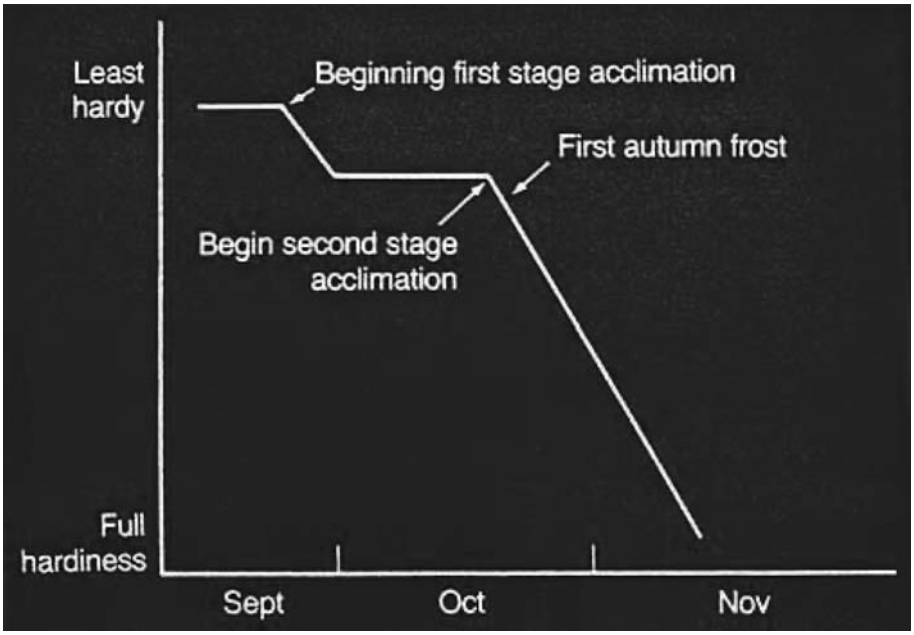


Figure 1. The image shows a typical acclimation process that plants undergo in the fall; starting out with little or no hardiness in September to full hardiness by December.
Source: North Carolina State University Extension

is directly correlated with reduced energy storage due to dry root balls. Dry plants in the fall may not have enough root reserve to break bud and shoot expansion in the spring.

Avoid late season pruning, which may stimulate bud break that ends up causing new growth that is not hardened off. Pruning like fertilization should stop six weeks before the first frost date.

When temperatures begin to drop, most plants slow their growth and begin the winter hardening process which ends up as dormancy. Figure 1 shows this process.

Light levels decrease in the fall, and shorter day lengths signal to the plants that dormancy is starting to occur. Shaded plants acclimate more slowly than those in the sun do. That is another reason for removing shade cloth in the fall.

Be sure to apply protective fungicides to plants being protected for overwintering. A fungicide drench for Pythium or Phytopthora is suggested. Also, a foliar fungicide application is suggested to protect any cut stems, branches or wounds during the hardening off process. If herbicides are used, be sure a safe amount of time has elapsed between application and the covering of poly houses to avoid crop injury. **IPM**

Fall turf tips

Kevin Frank, Crop and Soil Sciences

Fall fertilization

After a summer of rain and cool temperatures, September has had some of the driest and warmest weather we've had all year. If the turf hasn't been irrigated, its growth has certainly slowed, and it's unlikely you've seen any great response from a fertilizer application in late August or early September. If you didn't apply any fertilizer in early September and are looking to boost the turf as the fall moves along, I would probably wait until some moisture returns before applying any fertilizer.

Rust and red thread

Both rust and red thread have been showing up in lawns recently. If your lawn appears yellowish or orange-ish from a distance and upon closer inspection of leaf blades reveals yellow to dark brown spores, you've got rust. The good news is that in all but the most severe cases simply keeping up on your mowing and applying fertilizer should stimulate the turf to outgrow the rust. However, therein lies the challenge that moisture has been lacking and the turf growth has really slowed in the last couple weeks, unless you've been irrigating.

Red thread is a pesky disease that we have been receiving reports on from homeowners.

Red thread, if a problem, is usually found in under fertilized/slightly starved turf. With the relatively good growing weather that we've experienced throughout much of the year, many of the fertilizer applications that were applied earlier in the season have probably run out and now the turf could probably use another fertilizer application. Red thread is often found in areas dominated by fine fescues or perennial ryegrass. Red thread is easily identified by the pinkish-red mycelium that is threadlike and surrounds the leaf blade. In some extreme cases, it might remind you of miniature balls of pink cotton candy. The areas infected by red thread will die and the turf may appear wilted. The simplest fix for red thread is to apply a quick release nitrogen carrier such as urea at about 0.5 lb. N/1000 $ft.^2$ to encourage turf growth to mask the symptoms, but once again we need moisture or irrigation for a fertilizer application to be effective.

Fall broadleaf weed control

Fall is the ideal time to control broadleaf weeds because the weeds are storing carbohydrates in their root system and are more susceptible to herbicide applications. So if your turf has been overtaken by a bevy of broadleaf weeds, applying a herbicide in late September or early October will make a difference in what you battle next year. Apply the herbicides on a sunny day when rain is not in the forecast for 24 hours. We want the herbicides to dry on the leaf surfaces and not be immediately washed off. Hopefully, we'll have some precipitation in the next couple weeks to ensure the weeds are actively growing, otherwise if it remains dry the effectiveness of these applications may be reduced. There are many different herbicides that could be used including the most common three-way broadleaf weed control mixtures. As with any pesticide application, always make sure to wear the appropriate safety attire and follow all label recommendations. The greatest shortcoming of killing broadleaf weeds at this time of year is that you really don't get to watch them die. In many cases, you may not see the obliteration of these weeds this fall, but next year they won't be there or you will have at least reduced their numbers.

Fall seeding

If you're going to reseed an area, now is the time to get going. We are probably past the ideal seeding window, but if you can still get seed out in the next week it will probably have enough time to establish before winter, at least as long as winter isn't really early this year. Along the Grand Rapids-Lansing-Detroit corridor you are probably safe to seed until around October 1 and have enough time for the seed to germinate and survive the winter. If you're north of that line and still want to seed, hope for a warm fall. Consider that seed is relatively inexpensive and if you're not doing a huge area I wouldn't worry too much. If it doesn't survive the winter, you've got some practice in this fall and will be ready to go next spring.

Mulching leaves

If you look closely you can already see some leaves changing which means we'll soon see leaves falling. If you haven't tried to mulch leaves back into the turf maybe this is the year you start. Here's what you need to know to successfully mow leaves into the turf. First of all make sure your mower has a sharp blade, after a long season of mowing the blades may be dull at this time of year and trying to chop up leaves

will be more challenging with a dull blade. Second, raise the mower as high as it will go and mow at your normal speed, don't "rev" the throttle to the high jackrabbit setting and blaze around the yard. Try to mow the leaves when they are moist from the morning dew, but don't mow them when they're really wet. This will prevent the leaves from blowing all over the place and will help with your allergies. Finally, don't let the leaves pile up too high before you mow, too high would probably be greater than three to four inches of leaf depth on the turf. Mulching leaves helps the turf by returning nutrients and organic matter which can be especially beneficial on poor soils.

Final mowing

Many people ask about lowering the mowing height for the final mowing of the year. When you get past the leaf mulching period in the fall and the turf has essentially stopped its top-growth, it is OK to lower the mowing height to clean-up the turf and prevent the turf from being too tall going into winter. I would recommend that you lower the mowing height no more than one notch on your mower (typically a half inch). This will help you clean-up any left over leaf mulch or debris and give the turf a little trim before winter sets in.

Blogging turf

We recently revamped our MSU turfgrass website (www.turf.msu.edu). We now are adding regular blogs on turfgrass conditions throughout the state. So if you want to stay on top of the turf throughout the fall, check out our website. **IPM**

Dry weather could mean grub damage to lawns

Dave Smitley, Entomology

All the rain we had this summer has stopped and lawns in much of the state are looking dry. Dry weather in late September and October is when we are most likely to see grub damage. The reason for this is that a infestation of greater than 10 grubs per ft2 can consume more than 50 percent of all the turf roots in a lawn. As long as the soil remains moist and fertility levels are adequate, the turf plants will continue to grow new roots and take-up enough water. However, in very dry soil the turf plants stop growing and more than 50 percent root loss compromises uptake of enough water to keep the stressed plants alive. Consequently, turf plants will begin to die. The grubs don't mind, because they will eat the dead turf roots and stems as well as live ones.

Watch for developing patches of dead turf in dry lawns. Sample these areas with a cup-cutter or shovel. A cup-cutter removes and area equal to about 1/10 ft2 and a shovel with a six inch-wide blade will make a square area of ¼ ft2. Take samples and determine how many grubs are present. With five or less per ft2 frequent watering is all that is needed. With more than 10 per ft2, treat the infested areas with Sevin or Dylox and water frequently to keep the soil moist until November. **IPM**

Grub damage.

Fall invading insects

Howard Russell, MSU Diagnostic Services

Autumn is the time of year when we humbly and gratefully thank our lucky stars for surviving, though possibly not unscathed, the summer onslaught of biting insects, stinging insects and other annoying arthropods. However, we are not out of the woods yet: there could be large numbers of insects out there waiting to invade our homes and businesses. I say "could be" because we won't know that for sure until we get the first few frosts of the season.

There are four or five species of fall invaders that might show up on the outside walls of our homes looking for a nice crack or crevice to crawl into to protect themselves from our extreme winter weather (a depressing thought all by itself). I don't think these bugs intentionally seek out our homes for this purpose. It's just that our homes provide so many places for these bugs to hide in to pass the winter. As nighttime temperatures cool many of us will begin to see these insects congregating on the outside of the south and west facing walls of our homes. The unlucky may see thousands of them. If they just stayed on the outside of our homes, I think most people would not mind them so much, but they don't stay on the outside. In bad years hundreds may find their way inside to the very space where we spend the winter.

In general, these bugs are harmless: most do not bite; they do not eat fabrics, stored foods, wood or pets; and they do not lay eggs in the house. For most of the people I talk to about these bugs, the fact that they are harmless is of little or no consequence. Most people would rather not share their living space with a bunch of annoying, albeit harmless, bugs.

What to do, what to do?

Many people who offer advice on reducing these unwelcomed guests suggest sealing exterior cracks and holes with caulking to prevent their entry inside. This may work on older homes with clapboard siding, but no amount of caulk is going to keep them out of a home with vinyl siding. Vinyl siding and soffits are not tightly nailed down; these are nailed loosely or as they say in the trade, "hung." It is done this way to allow these vinyl panels to expand and contract with changing temperatures. Fall invading insects can find their way around the edges of these loose panels and into wall voids and attics. If homes were not heated these bugs

would likely be content to go dormant and spend the winter in these cozy confines. Unfortunately, our homes are heated and this warmth keeps these bugs active and as such, they find their way into the living space probably around baseboards, window and door moldings, openings for electrical outlets and fixtures, openings for heating/cooling vents and other such pathways. There is very little that can be done once the bugs are inside the walls. In homes invaded by these bugs, it is very common and likely that one will continue to see them throughout the winter.

Even aggressive and costly insecticide applications may not be effective because it is nearly impossible to treat every hidden area that may be harboring insects. Sealing cracks around electrical outlet boxes, switches and light fixtures, and around window and baseboard molding on the inside walls will help keep the bugs trapped within the walls. In older homes with double-hung windows equipped with pulleys, insects commonly enter living areas through the pulley opening. Masking tape applied over the opening will keep insects from entering through this route. A vacuum cleaner is a pretty effective method of removing the sluggish, slow moving bugs from inside the house. Spraying the outside walls of homes, especially the south and west facing walls with a long lasting insecticide registered for this use in September can help reduce the number of insects entering homes. These sprays should be applied when the first bugs are noticed congregating on outside walls. Before treating the whole house, spray a small test area to make sure the insecticide does not stain the siding or paint. **Be sure to read and follow all directions on the pesticide label**. Spraying the outsides of homes will, no doubt, involve spraying above one's head so **be sure to wear protective clothing such as a wide-brimmed hat and raincoat. Eye protection is a must.**

The bugs that we are most likely to see on our homes this fall include the multicolored Asian lady beetle, cluster flies, western conifer seed bugs, foreign grain beetles and everyone's favorite: the boxelder bug.

Boxelder bugs

Boxelder bugs, *Leptocoris trivittatus* (Hemiptera: Rhopalidae) are the most

J. Berger, USA. Courtesy of Bugwood.org

The ever present, but polite boxelder bug.

common fall invaders in Michigan. They are about a half inch long, dark colored with a red "V" on their backs. During the summer they feed on the flowers and seed pods of female boxelder trees. Two generations of nymphs are produced each summer. The developing nymphs are bright red and are quite nomadic. They can be seen roaming about yards and gardens throughout the summer months, often in alarming numbers. It is not essential to control boxelder bug nymphs during the early summer. These are not the same bugs that will invade the house in the fall. The nymphs present in June will mature into adults that will reproduce in July. It is this second generation of the summer that produces the home invading adults in October. For the most part, boxelder bugs are polite house guests; they don't bite, or stink and keep pretty much to themselves. Most of those that gather in my house die in the light fixtures.

Multicolored Asian lady beetle

The multicolored Asian lady beetle**,** *Harmonia axyridis* (Coleoptera: Coccinellidae) is by far the most annoying of the fall invaders. They bite, they stink and they do not keep to themselves like the more considerate boxelder bugs. They can be easily distinguished from other species of lady beetles by their larger size and presence

B. Ree, Texas A&M University, Bugwood.org.

The various colors and spot patterns of the obnoxious multicolored Asian ladybeetle.

of a black M-shaped pattern directly behind their head. Adults are large for ladybeetles and are about 1/4 inch long and 3/16 inch wide. Coloration varies (hence their common name) from bright orange with up to 19 black spots in some individuals to dull yellow with pale or no visible spots on others.

The multicolored Asian lady beetle is a native of Asia. There were several attempts to introduce the beetle into the southeastern and southwestern portions of the United States to help control aphids on pecan trees back in the late 1970's. Some say that none of these deliberate attempts succeeded, but that the beetle became established after "jumping ship'" somewhere along the Gulf Coast. Since then it has spread rapidly throughout the United States and southern Canada. It was first found in Ontario in 1992. Despite popular rumors, the beetle was not released by the DNR, MSU, or chemical companies. One reason that might explain their large numbers is our newest aphid pest, the soybean aphid. This aphid was discovered in Michigan and other Midwestern states during the summer of 2000. Thousands of these aphids can occur on a single soybean plant and the multicolored Asian ladybeetle is known to take advantage of this unlimited food source. When soybean aphid populations are high, we have experienced high numbers of lady beetles invading homes in the fall. Thankfully, soybean aphid numbers were low this past summer, so let's keep our fingers crossed.

During the fall, many people complain that the beetles bite, which in fact they do. These bites are very different from the bite of a mosquito and other blood sucking parasites. The bite of the multicolored Asian ladybeetle is more like a pinch and no blood meal is taken. The bite can be painful and very annoying if many of the beetles are present. If crushed or threatened, the beetles will emit a foul odor and leave a stain. People have complained that this odor lingers in their vacuum cleaners after collecting the beetles in their homes.

In kinder and gentler times when we were just dealing with our adorable *native* ladybeetles, I would not recommend killing them because they were cute and beneficial insects, but exotic invasive species often require

desperate measures. The multicolored Asian ladybeetle is **NOT** a protected species (another popular rumor). Spraying the exterior to help reduce the number of these swarming insects may not be a politically or socially correct action, but treating one's home is an option. It is difficult to imagine that the overall population of multicolored ladybeetles will be much reduced by folks spraying homes to keep them out. Those who fancy these beetles can vacuum them up and then release them some distance away from their house.

Cluster fly

The cluster fly**,** *Pollenia rudis* (Diptera: Calliphoridae) is another species that enters homes in late summer and early fall in search of protected sites in which to spend the winter. Cluster flies resemble the common house fly but differ in that they have a patch of yellow hairs under their wings. The cluster fly maggot is an internal parasite of earthworms and the flies are among the first to be active in the spring. They can be observed buzzing around yards just above the ground. They lay their eggs in cracks in the soil and the eggs hatch in about three days. Newly hatched maggots grab onto earthworms as they slither by and burrow into the worm to feed. Four to five weeks are required to complete a life cycle. The worm does not usually survive the experience. There are up to four generations of cluster flies in Michigan each year. Treating yards with insecticides to kill earthworms has not been shown to be effective in reducing the number of flies entering homes.

H. Russell, MSU Diagnostic Services

From above, the cluster fly looks pretty much like a garden variety house fly.

H. Russell, MSU Diagnostic Services

When a cluster fly is viewed from the side, a patch of golden hairs under the wings is easily seen.

D. Cappaert, MSU. Courtesy of Bugwood.org.

The western conifer seed bug.

Western conifer seed bug

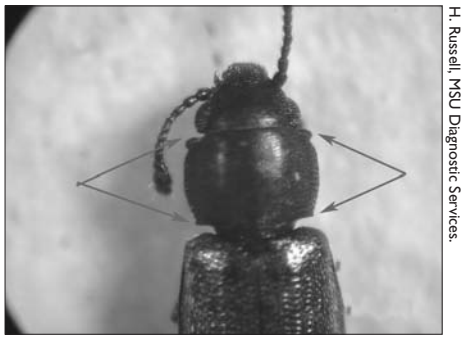
The **western conifer seed bug**, *Leptoglossus occidentalis* (Hemiptera: Coreidae) is the largest of the fall invading insects and is more of a problem for people who have several pine trees in their yards. This bug is thought to be a western species that more or less expanded its range to now include most of the United States. This true bug feeds mainly on the seeds and developing cones of several species of conifers. The western conifer seed bug is 3/4 inch long and brownish on top. The upper (dorsal) side of the abdomen is yellow or light orange with five transverse black patches. This bug produces a single generation each year.

Foreign grain beetle

The **foreign grain beetle**, *Ahasverus advena* (Coleoptera: Cucujidae) feeds primarily on molds and fungi growing on damp grain, grain products, and other materials. It is found throughout the world and is very common around grain processing facilities where damp, moldy grain is allowed to accumulate. Little is known about its habits in "nature," however, it is reasonable to assume this beetle can occur in any damp situation where fungi persist. When found around the home, the beetle may come from damp crawlspaces, basements, bark mulch, and possibly moldy flour or flour products. It is also very likely that the beetles originate outside and are attracted to something inside that is damp and moldy. These beetles can fly and are very small, so it is possible for them find their way into the house through screens and around loosely fitting windows and doors. One odd thing about this beetle is that many, if not most, of the specimens sent to the lab were collected from new homes. Possibly, because the wood, plaster, concrete and other building materials in new construction may not be completely dry and support a thin, invisible layer of fungi which attracts the beetles. These insects will stop coming in from the outside as colder fall temperatures arrive. **IPM**

H. Russell, MSU Diagnostic Services.

The foreign grain beetle is the smallest of the fall invaders.



H. Russell, MSU Diagnostic Services.

A close up of a foreign grain beetle shows the rounded lobes on the corners of the pronotum.

Weather news

Jeff Andresen, Agricultural Meteorology and Geography

After an extended period of mostly sunny, dry weather across the state and region (many areas have been dry since August 30-31), forecast guidance is now suggesting some major upper air changes during the upcoming week. The upper air ridging pattern across the region that has led to the abnormally dry conditions (In the State Climatology Office, we've referred to it as our Michigan version of "California weather.") will give way to a troughing pattern by early next week, resulting in wetter and possibly cooler weather.

In the short term, a weak cool front will move through the state Friday, September 18, possibly setting off a few widely scattered showers or sprinkles. Most areas will remain dry and experience only a temporary increase in cloudiness and a wind shift to the north by late in the day. High pressure behind the front will move into the state by Friday evening, bringing clearing cool, dry and fall-like conditions. Some scattered light frost will be possible overnight Friday into Saturday morning, mainly in interior sections of the Upper and northern Lower Peninsulas. The high pressure should lead to fair and dry conditions Saturday and Sunday. By Monday, the transition to the upper air pattern mentioned above should be underway with the threat of showers statewide. An unsettled weather pattern is likely through the middle of next week with a chance for rainfall on a daily basis. High temperatures the next few days will generally reach the low or mid-70's with lows from the 40's north to upper 50's south except for Saturday morning, when 30's are likely across northern and central sections of the state.

Medium range forecast guidance is primarily based on the upper air pattern change noted above (ridging across western North America, troughing across central sections), although latest versions suggest the strength of the troughing may be less than in previous models. The other hint from the latest guidance is that this upper air change may be somewhat temporary with the troughing feature moving out after a few days resulting in a gradual moderation of temperatures.

As it stands right now, the NOAA Climate Prediction Center **6-10 day** and **8-14 day outlooks** for September 23-27 and September 25 to October 1, call for below normal mean temperatures state- and region-wide. Based on the most recent forecast guidance, I am personally hoping for and expecting a bit more moderate conditions than this scenario. For precipitation totals, the outlooks call for above normal totals across Lower Michigan and near normal totals across the north during the 6-10 day time frame. During the 8-14 day period, precipitation totals are forecast to range from below normal levels across far northwestern sections of the state to above normal levels across the far southeast. **IPM**

ACTUAL AND PREDICTED DEGREE-DAY
ACCUMULATIONS SINCE MARCH 1 2009 (*)

STATION OR DISTRICT	BASE 42 BE DEGREE-DAYS AS OF 09/17 2008	BY 2009	BY 09/22	BY 09/27	BASE 50 BE DEGREE-DAYS AS OF 09/17 2008	BY 2009	BY 09/22	BY 09/27
WEST UP NORMS**		2822	2886	2938		1773	1808	1833
HOUGHTON	2463	2383	2425	2479	1443	1376	1396	1418
IRONWOOD	2624	2612	2658	2718	1590	1549	1571	1596
MARQUETTE	2574	2466	2510	2566	1544	1447	1468	1491
STEPHENSON	2971	2830	2880	2944	1880	1749	1774	1802
EAST UP NORMS		2583	2648	2700		1550	1582	1604
CHATHAM	2422	2428	2478	2536	1470	1420	1444	1464
SSMARIE	2686	2551	2603	2664	1603	1483	1508	1529
N.W. LP NORMS		3119	3200	3264		2014	2061	2095
BEULAH	3299	3039	3097	3175	2128	1874	1904	1941
LAKECITY	3044	2828	2882	2955	1929	1718	1746	1779
PELLSTON	2908	2590	2639	2706	1822	1564	1589	1620
N.E. LP NORMS		3050	3128	3189		1946	1991	2022
ALPENA	3082	2836	2887	2959	1957	1737	1765	1797
HTNLAKE	3146	2852	2903	2976	2006	1731	1759	1791
ROGERCITY	3111	2825	2876	2948	1978	1708	1735	1767
VANDERBILT	2963	2676	2724	2792	1867	1616	1642	1672
W. CENT. LP NORMS		3394	3483	3554		2234	2288	2328
FREMONT	3399	3271	3337	3421	2214	2057	2093	2136
LUDINGTON	3089	2921	2980	3055	1942	1759	1790	1826
MUSKEGON	3504	3552	3623	3715	2291	2303	2344	2391
CENT. LP NORMS		3480	3569	3640		2308	2362	2402
BIGRAPIDS	3301	3053	3111	3190	2151	1888	1920	1959
E. CENT. LP NORMS		3515	3609	3687		2339	2397	2441
SAGINAW	3640	3448	3516	3619	2427	2208	2249	2303
STANDISH	3180	3013	3073	3162	2054	1864	1898	1944
S.W. LP NORMS		3832	3936	4025		2600	2667	2719
GRAPIDS	3885	3739	3807	3915	2646	2457	2498	2558
GULLLAKE	4221	3957	4029	4143	2937	2638	2683	2746
HOLLAND	3908	3836	3906	4016	2661	2550	2593	2654
SOUTHBEND	4015	3927	3998	4111	2751	2618	2662	2725
WESTOLIVE	3528	3453	3516	3615	2324	2218	2255	2309
S. CENT. LP NORMS		3747	3848	3932		2536	2601	2650
ALBION	3746	3590	3658	3760	2504	2328	2369	2424
COLDWATER	3727	3724	3795	3901	2492	2447	2490	2548
LANSING	3770	3575	3643	3745	2539	2301	2342	2396
S.E. LP NORMS		3769	3872	3960		2547	2614	2666
DETROIT	4154	3982	4056	4170	2865	2653	2699	2762
FLINT	3802	3464	3528	3627	2570	2214	2253	2305
MILFORD	3490	3364	3426	3523	2294	2124	2161	2212
MTCLEMENS	3719	3652	3720	3824	2497	2372	2413	2470
ROMEO	3645	3467	3531	3631	2427	2226	2265	2318
TIPTON	3763	3583	3649	3752	2518	2316	2356	2411
TOLEDO	4086	3980	4054	4168	2823	2656	2702	2765

* Since weather data for some agricultural stations are not available prior to April 1st, GDD values for those stations during February and March are estimated with closest available station data.
** District normals were calculated as the mean of daily GDD totals at several stations within each district for the period 1951-1980.
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Michigan State University Cooperative Agricultural Weather Service
Cumulative Precipitation Summary For 09/17/2009

STATION	DIST	PRECIPITATION TOTALS SINCE 09/11/2009 (last week) Actual	09/04/2009 (last 2 weeks) Actual	Dev. Norm.	08/21/2009 (last 4 weeks) Actual	Dev. Norm.	04/01/09 (since Apr.1) Actual	Dev. Norm.
HOUGHTON	WU	0.00	0.01	-1.67	2.76	-0.86	13.35	-5.09
IRONWOOD	WU	0.00	0.00	-1.68	1.54	-2.08	11.27	-7.17
MARQUETTE	WU	0.00	0.00	-1.68	1.54	-2.08	12.80	-5.64
STEPHENSON	WU	0.00	0.00	-1.68	1.30	-2.32	13.16	-5.28
CHATHAM	EU	0.00	0.00	-1.58	0.88	-2.42	14.87	-2.42
SSMARIE	EU	0.00	0.06	-1.52	1.57	-1.73	13.21	-4.08
BEULAH	NWL	0.00	0.00	-1.52	2.08	-1.06	17.86	1.58
LAKECITY	NWL	0.00	0.00	-1.52	1.09	-2.05	17.69	1.41
PELLSTON	NWL	0.00	0.00	-1.52	1.41	-1.73	12.39	-3.89
ALPENA	NEL	0.00	0.00	-1.52	2.40	-0.69	19.02	2.72
HTNLAKE	NEL	0.00	0.00	-1.52	0.88	-2.21	16.27	-0.03
ROGERCITY	NEL	0.00	0.00	-1.52	1.04	-2.05	20.75	4.45
VANDERBILT	NEL	0.00	0.00	-1.52	1.49	-1.60	16.56	0.26
FREMONT	WCL	0.00	0.00	-1.42	0.54	-2.49	14.94	-1.63
LUDINGTON	WCL	0.00	0.00	-1.42	1.08	-1.95	15.09	-1.48
LUDINGTON	WCL	0.00	0.00	-1.42	1.08	-1.95	15.09	-1.48
MUSKEGON	WCL	0.00	0.00	-1.42	1.03	-2.00	14.58	-1.99
BIGRAPIDS	CL	0.02	0.02	-1.25	1.50	-1.53	20.49	3.12
SAGINAW	ECL	0.00	0.01	-1.11	0.48	-2.05	15.92	0.43
STANDISH	ECL	0.00	0.00	-1.12	1.00	-1.53	15.23	-0.26
GRAPIDS	SWL	0.00	0.04	-1.33	1.78	-0.99	21.31	3.46
GULLLAKE	SWL	0.02	0.09	-1.28	3.13	0.36	21.56	3.71
HOLLAND	SWL	0.50	0.76	-0.61	3.49	0.72	31.02	13.17
SOUTHBEND	SWL	0.00	0.07	-1.30	3.56	0.79	21.73	3.88
WESTOLIVE	SWL	0.00	0.00	-1.37	1.60	-1.17	17.93	0.08
ALBION	SCL	0.00	0.35	-0.80	1.82	-0.82	19.16	1.49
COLDWATER	SCL	0.00	0.14	-1.01	1.15	-1.49	17.80	0.13
LANSING	SCL	0.00	0.00	-1.15	2.13	-0.51	24.28	6.61
DETROIT	SEL	0.00	0.55	-0.48	1.41	-1.05	19.05	2.10
FLINT	SEL	0.02	0.02	-1.01	0.78	-1.68	22.16	5.21
MILFORD	SEL	0.00	0.20	-0.83	1.04	-1.42	19.54	2.59
MTCLEMENS	SEL	0.00	0.00	-1.03	0.00	-2.46	2.74	-14.21
ROMEO	SEL	0.00	1.07	0.04	2.20	-0.26	18.03	1.08
TIPTON	SEL	0.00	1.00	-0.03	3.06	0.60	18.11	1.16
TOLEDO	SEL	0.00	1.95	0.92	2.66	0.20	18.43	1.48

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