Pests seen in August
Spider mites – juniper, Alberta spruce, honey locust, red maple
Lacebug – azalea, hawthorn, oak
Leafhopper damage – red maple, coneflower
powdery mildew – dogwood
Japanese beetles – misc. plants
Eastern Pine Shoot Borer – mugho pine
Yellow necked caterpillars – hawthorn
Root rot – Japanese holly
Borers – prunus
Scab – pyracantha
Freeze damage - ash
Emerald Ash Borer
USDA Bulletin & NMPro Email

Mich. Dept. of Ag. reported the discovery of emerald ash borer in the southeastern portion of the state, the 1st reported find in North America. Its host range is limited to ash species, but it can kill entire mature trees in 2 seasons. The borer has been found at nurseries, in landscapes and in wooded areas. MDA issued a quarantine for Livingston, Macomb, Oakland, Washtenaw and Wayne counties. Items regulated include ash trees, limbs, firewood, logs and untreated ash lumber.

On August 6, 2002, the Michigan Invasive Species Task Force met to discuss options for management of this destructive exotic pest of ash trees in Michigan. The task force is developing a containment strategy involving survey, regulatory, suppression, sanitation and research components. Also in attendance were representatives of USDA-Forest Service (FS), several APHIS staffs and Canadian national and provincial governments. On August 8, the APHIS-PPQ’s New Pest Advisory Group reviewed current economic impact, distribution, and biological information concerning the pest in preparation of making response recommendations to PPQ management.

Recently, Canada has officially notified the U.S. that emerald ash borer has been found in Essex County in Ontario province across the border from the Detroit area.

On August 22 and 23, FS, APHIS, Agricultural Research Service, State of Michigan, and Canadian representatives will visit infested sites in both Michigan and Ontario to better understand the scope and severity of the outbreak and discuss mutual management and research options. APHIS and Forest Service are determining if other outbreaks of the pest might exist outside of Michigan through outreach efforts and targeted surveys of forest health monitoring plots.

New Dogwoods
NM Pro email

Univ. of Tenn. developed ‘Appalachian Spring,’ an anthracnose-resistant dogwood, and its budwood is now available to nurseries. Initially, production rights to ‘Appalachian Spring’ will be limited to Tennessee producers. Before receiving budwood, growers must sign a licensing agreement. ‘Appalachian Spring’ was developed from a tree that survived an anthracnose outbreak in Maryland’s Catoctin Mountain Park. The university also has produced 3 powdery mildew-resistant dogwood cultivars, ‘Appalachian Snow,’ ‘Appalachian Mist’ and ‘Appalachian Blush.’

Plum Pox – Pennsylvania
USDA Bulletin

As a result of surveys of commercial orchards carried out by USDA and State inspectors, Plum Pox Virus (PPV) has been confirmed at an orchard outside of the current quarantine areas for the first time this year. The detection was made at an orchard in Monaghan Township, York County. PPV was identified by scientists at the State laboratory in Harrisburg, PA, and confirmed by Scientists at the PPQ-Center for Plant Health Science and Technology in Beltsville, MD. In addition to requiring the removal of the orchard, the project staff will also be requiring the removal of all host material within 500 meters. This will result in the removal of a total of 50 acres of orchard. The State and USDA will be revising the current quarantine areas to include an area that includes the new find.

Lacebugs Can Whiten Shade Trees And Landscape Plants
By Lee Townsend, Extension Entomologist

Lacebugs use their sucking mouthparts to feed on plant sap. Damage ranges from scattered small white spots to complete bleaching of the leaves. Some species feed on many different types of plants while others feed only on a narrow range or single species. Injury builds slowly but can become very intense late in the summer. The adult and nymphal stages of the same species can look very different, which can confuse identification.

Azalea lacebugs, about 1/8” long with light brown bodies, are one of the common offenders. They prefer evergreen varieties but attack deciduous varieties and mountain laurel. Sap removal by adults and nymphs, which feed on the underside of the leaves, causes a spotting visible on the upper surface. In heavy infestations, leaves may turn white an drop prematurely. Spots of their tarry excrement build up on the under sides of the leaves. The lacy wings of the adults have dark brown to black markings, nymphs are black and spiny. Populations are greatest in mid- to late summer as the second generation bugs appear.

Insecticidal soap (Safer) can be used to reduce lacebug numbers. The spray must be directed to the underside of the leaves to contact the insects directly. The treatment may need to be repeated to bring populations under control.

Grub Damage Already Appearing
by Mike Potter and Dan Potter, University of Kentucky

White grubs are the most important insect pests of lawn grasses in Kentucky. Several different kinds of white grubs, in particular, the larvae of masked chafers and Japanese beetles can cause damage to turf when the grubs feed on the grass roots. Grub damage is showing up on lawns and golf courses early this year, owing to drought and very warm spring and summer temperatures.

Drought stressed or diseased turf can easily be mistaken for grub damage. Early symptoms of white grubs include gradual thinning, yellowing, and weakening of the grass stand followed by the appearance of scattered, irregular dead patches. As damage continues, the dead patches may increase in size, and apparently healthy turf areas may suddenly wilt. Sod that is heavily grub-damaged is not well anchored and can be pulled loose from the soil like a carpet, exposing the white, C-shaped larvae. If the brown patches do not pull up easily, the problem is usually...
related to other causes. Another indication that white grubs may be present is if moles, skunks or flocks of blackbirds find the turf attractive. White grubs should also be suspected if adult beetles were abundant in the area in June and July, or if you had a serious grub problem last year.

Control -- It is getting too late for imidacloprid (Merit) or halofenozide (Mach 2 or Scott's Grub-Ex ), as both of these insecticides are best applied preventively, before egg hatch. If damage shows up, the options for rescue treatments are trichlorfon (Dylox ) or Sevin. Sevin kills earthworms, which can aggravate thatch, so trichlorfon is probably a better choice, especially for home lawns. Normally the entire lawn will not need to be treated. Grub "hot spots," which can be confirmed by sampling, are most likely to be in full sun, lawns seeded with Kentucky bluegrass, lawns that were heavily irrigated during June and July, and turf areas that were damaged by grubs in previous years.

For best results, mow the lawn and rake out dead grass and thatch before treatment. Water the lawn immediately after application to wash the insecticide down into the root zone where the grubs are feeding. Watering in is especially important for spray applications; once spray residues dry on foliage, they cannot be washed into the root zone by later drenchings. For this reason, granular formulations may be easier to use since timing of irrigation is not so critical. Treated areas should be drenched with 1/2 - 1 inch of water, using a lawn sprinkler. The required amount of water can be determined by placing a disposable pan or rain gauge in the treated area.

For more information on white grubs, consult the publications ENT-10, Controlling White Grubs In Turfgrass, and Entfact- 441, Insecticides for Control of White Grubs in Kentucky Turfgrass.

Giant Caterpillars Active  
by Lee Townsend, Extension Entomologist

Several species of our giant caterpillars are reaching maturity now and leaving trees to find a protected place where they can spin a cocoon and pupate. Most are striking because of their size and the ornate barbs, horns, or spines on their body. Pictures to help with identification can be found at www.uky.edu/Agriculture/Entomology/entfacts/misc/ef008.htm

Orange-Striped Oakworms  
by Lee Townsend, Extension Entomologist

Orange-striped oakworms are black caterpillars with eight narrow yellow stripes that run the length of the body. There are a pair of curved "horns" behind the head. Small larvae feed in groups and skeletonize the leaves, older larvae eat all of the leaf except the main veins.

They usually destroy all of the leaves on a branch before moving to a new feeding site. Infestations usually start in the top of the tree and the larvae move down as they feed and destroy foliage. Sprays of B-t (Bacillus thuringiensis - Dipel, etc.) will control these insects. B-t works as a stomach poison so treated leaves must be eaten. Direct spraying of the caterpillars will not kill them.

Grape Root Borer: The Unseen Pest Of Grapes  
by Ric Bessin, Extension Entomologist

(This article was written in late July). While surveying for sharpshooters and other leafhoppers on grapes this weekend, I spotted what initially looked like a large, brown paper wasp sitting on a grape leaf. But it wasn't a paper wasp at all, it is a grape root borer (GRB) female moth. They these moths fly during the day and are mimics of paper wasps. Less than a minute after spotting the female, it was joined by two male moths. That same afternoon, I found two other female GRB moths. At least in this one location, GRB moths were active.

GRB is one pest of grapes that is often ignored until it becomes a serious problem affecting the vineyard. Symptoms of GRB attack include poor vine growth and fruit set, even loss of some vines. The larvae spend 22 months feeding in the roots and crown of grape vines before emerging as adult moths. Generally the moths are active from July through September and lay eggs on grape leaves or weeds. The eggs hatch and the larvae drop to the ground and burrow down to the roots.

Good weed management assists with control of GRB. Eliminating weeds around the base of vines reduces the sites for egg laying and improves spray coverage for GRB control. In small plantings, plastic mulch works as an effective barrier around the base of vines not allowing the GRB larvae from becoming established. Another alternative is control through the use of mating disruption. Commercially available pheromone dispensers are placed in the vineyard at a rate of 100 per acre. This prevents the males moths from locating the females and mating. This method works best where vineyards are located away from woodlots and other wild grapes which serve as a source of mated female GRB moths. In terms of chemical control, Lorsban is the only insecticide labelled for control of GRB. This treatment is applied directly to the ground under the grape trellis at least 35 days prior to harvest. Do not allow this spray to contact the fruit or foliage. We recommend treatments for GRB if more than 5 percent of the vines are found to have GRB pupal cases emerging from the soil.

Managing the pH of container media.  
Paul Fisher, Extension Specialist, University of New Hampshire

Part 2 of 2  
Correcting medium-pH Problems

The following recommendations for raising or lowering medium-pH are intended for crops already under severe stress. Prevention of pH problems is better than relying on
a cure, and these actions are intended for crops that would be unsaleable without intervention. Phytotoxicity or staining is very likely with these chemicals, and applications should be tested on a small number of plants before applying to the entire crop. Necrotic tissue will not recover, and the goal is to produce new healthy foliage that will cover damage.

Correcting low medium-pH

When pH falls below the optimum range, the first steps are to (a) stop acidifying water if acid is being injected, and (b) shift to a nitrate-based fertilizer (e.g. 13-2-13 or 15-5-15). Further action is needed if pH has not risen within a week and plants are becoming stressed. Consider soil drenches with either flowable lime or potassium bicarbonate. Other options (hydrated lime or potassium hydroxide) have specialist uses but are less reliable as a corrective liming material.

Several factors affect the choice between flowable lime versus potassium bicarbonate. Flowable lime has a more predictable and stable effect on medium-pH, without increasing medium-EC. Potassium bicarbonate is easier to apply however and should be used on flood floors or when applied through low-volume drippers. Both liming materials are fast-acting and show most of their effect on medium-pH within one day. Following a drench, you can reapply after five days if pH is not up to the optimum range.

To minimize phytotoxicity from flowable lime or potassium bicarbonate, apply in cool weather so the material does not dry quickly on foliage; avoid splashing of foliage during application; immediately rinse foliage with a fine spray; and apply with generous leaching to maximize the effect at low concentration.

Other tips for applying flowable lime:
- Apply at 4 qts./100 gallons (10 mL/Liter = 1:100).
- An injector can be used to dilute the solution, but the lime particles can be very abrasive.

Immediately clean equipment after application.
- Do not apply through drippers or on flood floors because it will clog equipment and leave residue.

Other tips for applying potassium bicarbonate:
- Apply at 2 lbs./100 gals (2.4 grams/Liter).
- Can be delivered through emitters or on flood floors.
- One day after application, apply a basic fertilizer (e.g. 13-2-13) with moderate leaching to wash out salts and to reestablish nutrient balance.
- It is likely that repeat applications may be needed.

Correcting high medium-pH

Several actions may be necessary when medium-pH is too high.

1. Use a high-ammonium fertilizer combined with low alkalinity. Check with your fertilizer manufacturer to select a high-ammonium (very acidic) fertilizer (e.g. 9-45-15 or 21-7-7). The effect on medium-pH can sometimes be slow (> 1-2 weeks) especially in cool wet conditions, or with small plants growing in large containers. Repeated applications of ammonium in cool, dark conditions may also cause toxic levels of ammonium to accumulate in leaf tissue.

If you have the necessary equipment, and alkalinity is >80 ppm, acidify water to drop the irrigation water-pH to around pH 4.5 (which gives near-zero alkalinity). Continue until medium-pH is in the target range. For the appropriate acid rate for your water source, see www.ces.ncsu.edu/depts/hort/floriculture/software/alk.html

2. Correct micronutrient deficiencies. Masking the symptoms of high pH with micronutrient applications can be very effective for keeping plants alive and healthy when grown under high media-pH conditions. However, unless your customers continue the iron sprays or drenches, or transplant the plants soon after receiving them, quality will suffer. Always use a tissue analysis to test which nutrient is deficient. Although iron deficiency is most common, if a different nutrient (e.g. manganese) is limiting then application of iron may worsen the problem because of antagonistic effects.

Iron comes in different forms that vary in solubility at high pH. Best to worst in terms of effectiveness as a drench at high pH are: Iron-EDDHA "Sequestrene 138" or "Sprint 138" > Iron-DTPA "Sprint 330" >Iron-EDTA > Iron sulfate.

The recommended application rate for an iron drench is 10 oz/100 gal of either Iron-EDDHA (provides 45 ppm iron), or Iron-DTPA (75 ppm iron). The solutions should be applied with generous leaching, followed immediately by washing of foliage to avoid leaf spotting. All options are low cost, at less than 0.1 cents per 4-inch-diameter pot. Iron-DTPA (Sprint 330) can be purchased from greenhouse and nursery suppliers. Ask for Iron-EDDHA (Sequestrene 138 or Sprint 138) from a fertilizer representative.

Foliar sprays are also somewhat effective, especially if iron chlorosis is mild. Suggested iron forms and rates for iron sprays are Iron-EDTA (60 ppm iron, equals 6.1 oz/100 gal) or Iron-DTPA at 60 ppm iron (8 oz/100 gal). Repeat applications are likely to be needed every 5 days because the iron is not transported to new leaves, and the plant can grow out of a foliar spray. Phytotoxicity is likely, and after applying foliar sprays to a test group wait 3 days to check for damage before applying to the entire crop.

Spray application method is very important. Tips for maximum effectiveness of foliar sprays:
- Include an organosilicone surfactant (e.g. Capsil TM at 13 oz/100 gal)
• Apply in early morning on cool, cloudy days for gradual drying of leaves in order to increase uptake and reduce spotting (Figure 9)

• Spray both sides of leaves because penetration may be better on the underside of leaves where the cuticle is thinner.

3. Consider acid drenches in extreme cases. Iron sulfate or sulfuric acid drenches can reduce medium-pH but **phytotoxicity is very likely**. To minimize phytotoxicity with either chemical, apply during a cool morning. Avoid contact with foliage, and immediately rinse foliage after application. Applying with generous leaching.

Aluminum sulfate should only be used to drop medium-pH for hydrangeas, because otherwise it is will cause nutrient imbalances. Flowable or elemental sulfur is sometimes used to drop pH in the nursery trade, but tends to cause a gradual reduction in medium-pH over time that is difficult to control (because microbial action is needed for the sulfur to be effective).

**Iron sulfate** provides iron (which is usually deficient in plants at high pH) in addition to causing a temporary drop in medium-pH. This material increases EC (1.2 dS/m at 2 lb/100 gal) and the excess iron (2 lb/100 gal provides 500 ppm iron) may cause imbalances if pH falls below 6.0. Iron sulfate should NEVER be used with iron-efficient species or long-term crops. 2 lb/100 gal is the maximum recommended rate – higher rates up to 6 lbs/100 gal will cause a greater drop in medium-pH, but also have increased risk of phytotoxicity.

Other tips to applying iron sulfate:

• Store dark and dry. Iron sulfate oxidizes over time, and has a 6-12 month shelf life. Mix in water with a pH below 7.0 and only use if the final solution is not cloudy.

• Can stain media and plastic subirrigation benches black.

**Table 3.**

As a guideline for the commonly-used 35% sulfuric acid ("Battery acid") or other acid forms, use the following table as a guideline to drop the pH of irrigation water to 4.5 with different starting alkalinitities.

Amount of acid (fluid ounces per 100 gallons) required to neutralize alkalinity in the irrigation water, and bring pH of irrigation water down to approx. 4.5 (if alkalinity is below 80 ppm, acidification is unlikely to be necessary)

<table>
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<tr>
<th>ppm CaCO₃</th>
<th>35% sulfuric acid</th>
<th>93% sulfuric acid</th>
<th>61.4% nitric acid</th>
<th>67% nitric acid</th>
<th>75% phosphoric acid</th>
<th>85% phosphoric acid</th>
<th>Seplex-L organic acid</th>
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<tr>
<td>50</td>
<td>1.4</td>
<td>0.4</td>
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<td>0.8</td>
<td>1</td>
<td>0.9</td>
<td>1</td>
</tr>
<tr>
<td>100</td>
<td>2.8</td>
<td>0.7</td>
<td>1.9</td>
<td>1.7</td>
<td>2.1</td>
<td>1.7</td>
<td>2</td>
</tr>
<tr>
<td>200</td>
<td>5.6</td>
<td>1.4</td>
<td>3.8</td>
<td>3.4</td>
<td>4.2</td>
<td>4.2</td>
<td>4</td>
</tr>
<tr>
<td>300</td>
<td>8.4</td>
<td>2.1</td>
<td>5.7</td>
<td>5.1</td>
<td>6.2</td>
<td>5.1</td>
<td>6</td>
</tr>
<tr>
<td>400</td>
<td>11.2</td>
<td>2.8</td>
<td>7.5</td>
<td>6.8</td>
<td>8.3</td>
<td>6.8</td>
<td>8</td>
</tr>
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