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CORN

Some Unusual Kernel Injuries

By Paul Vincelli, Extension Plant Pathologist
Chad Lee, Extension Agronomist
Ric Bessin, Extension Entomologist

Based on a limited number of cases we saw last week, there are two unusual injuries Extension agents and others should be on the watch for.

“*Popped kernel*” is the name given to kernels where the seedcoat on the crown of the kernel breaks open, giving it the appearance of a partially popped popcorn kernel (Figure 1). Little is known about this condition, although it has been associated with irregular rainfall, especially when very hot and dry conditions are common. We speculate that the injury occurs when very dry weather during grain fill is followed by a flush of rainfall, causing the endosperm to outgrow the pericarp. However, this is speculation, since scientific research on this is lacking.

“*Silk cut*” is a different condition resulting in a rupture of the seedcoat where it is in contact with unpollinated silk. While the genesis of “silk cut” is not well-understood, it is thought that contact with unpollinated silk (which can remain alive for days) interferes with normal

expansion of the developing seedcoat, resulting in a rupture of the kernel. Unpollinated kernels are certainly common this year, because of heat and drought during the pollination of many corn crops.

Because both of these conditions result in a rupture of the seedcoat, each opens the kernels to invasion by ear and kernel rot fungi. In particular, this condition raises concern about possible avenues of infection by mycotoxin-producing fungi, especially those that produce fumonisins or aflatoxins.

Given the widespread occurrence of very hot, dry conditions during pollination, we suggest the following:

1. Scout fields for these and other forms of kernel injury.
2. For affected fields, be prepared to harvest in a timely way and dry grain promptly.
3. Provide good storage conditions (aeration, monitoring for mustiness, etc.) for all grain but especially for corn from fields showing kernel injury.
4. Market affected grain promptly.



Figure 1. "Popped kernel" condition, associated with irregular rainfall, especially including very hot and dry conditions. Note the two sap beetle larvae on the left side of the photo, which are attracted to the ruptured kernels (Photo by Patrick Preston, Preston Farms, used with permission).

them. As the purple spots enlarge, the centers of the spots turn tan or gray (Figures 2-3). The spots are usually about one-fourth inch in diameter and the fungus produces spores in their tan centers (Figures 4-5). Spores produced in the spots can be rain-splashed or wind-blown to other hydrangeas nearby to begin new infections. Heavily spotted leaves may turn light green or yellow and drop from the plant. These infected, fallen leaves can be an overwintering site for the fungus and a source for new disease the next year. During the growing season, disease development and spread are slowed significantly by extended periods of drought.



Figure 2. Hydrangea leaf infected with *Cercospora* leaf spot disease (P. Bachi photo).

SHADE TREES & ORNAMENTALS

Hydrangea *Cercospora* Leaf Spot is Active

By John Hartman

Cercospora leaf spot of hydrangea is being observed more often than usual this summer in home landscape plantings throughout Kentucky. This disease, caused by the fungus *Cercospora hydrangeae*, also has the potential to damage plants growing in the nursery. The common landscape hydrangeas, including bigleaf, oakleaf, panicle, and smooth-types are all susceptible. Although plants are not killed by leaf spot, it can cause premature defoliation which may reduce flowering and plant vigor. *Cercospora* leaf spot is favored by warm weather with frequent rain showers such as that experienced here this summer.

Symptoms. Infected leaves in the lower part of the plant may first be observed in mid-summer with small circular purple spots scattered across



Figure 3. *Cercospora* leaf spots showing tan centers surrounded by purple halos (P. Bachi photo).



Figure 4. Close-up view of a single leaf spot. Black spore-producing fungal structures can barely be discerned in the tan portion of the spot (P. Bachi photo).

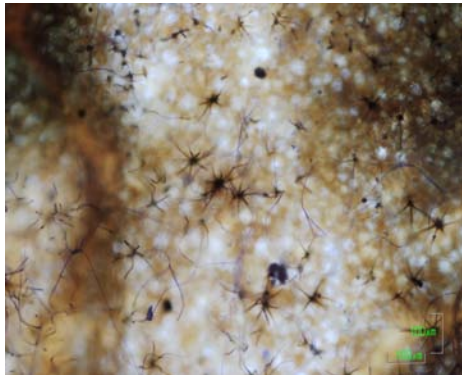


Figure 5. Magnified view of *Cercospora* fungus within a leaf spot. Star-like objects are *Cercospora* spore-bearing structures. This view might be seen with a high-powered hand lens or a dissecting microscope (P. Bachi photo).

Disease management.

- Provide good plant spacing so that air movement and sunlight penetration can dry the leaves quickly.
- Avoid use of overhead watering of the plants or water early in the morning so that leaves can dry off during daytime.
- Remove and destroy dead diseased leaves (when they are dry) to reduce disease spread. Clean out plant debris in winter to prevent overwintering of the fungus.
- Fungicide treatments are suggested only on valuable plants that incur noticeable damage every year. Fungicides containing active ingredients such as

azoxystrobin, chlorothalonil, mancozeb, myclobutanil, or thiophanate-methyl are suitable for managing this disease. Fungicide applications would need to begin just before or just as spots are beginning to appear. Repeat applications may be needed.

Sawflies – Caterpillars that are Different

By Lee Townsend

Caterpillars are familiar leaf feeders on many landscape plants. However, a closer look can avert control problems if the damaging insects are sawflies – larvae of plant feeding wasps instead of caterpillars - immature stages of butterflies and moths. It seems that sawflies have been more problematic than normal on deciduous trees and shrubs this year. Troubles usually come from species that attack conifers.



Figure 6. Elm argid sawfly, note how leaf area turns brown after feeding.

The number of abdominal legs is the easiest characteristic to use. Sawflies have a pair of fleshy legs on each abdominal segment; caterpillars have four or fewer pairs. Also, sawflies have a single eyespot on each side of the head and sometime it is dark and distinct.



Figure 7. Loosestrife sawfly on *Lysimachia* single eye spot on head and extra fleshy legs on abdomen are characteristic of sawflies.

The importance of this difference comes in selection of chemical control because Bt (*Bacillus thuringiensis*) products will control caterpillars but not sawflies. Pyrethroids (permethrin, etc) or carbamates (Sevin) will control sawflies.

Unusual Sightings

By Lee Townsend

Often there are unusual sightings or mysteries in the landscape at this time of the year. Here are a few that you might run across.

The spined *Micrathena* are orb-weaver spiders with vivid colors and distinctive spikes. They spin flat webs in meadows and along woodland trails.



Figure 8. Arrowshaped micrathena.



Figure 9. Hickory horned devil caterpillar.

Several species of giant caterpillars are finishing their feeding periods and can be found wandering in search of a secluded spot to spin a cocoon and pupate. The hickory horned devil is one of the more ominous. It also feeds on sumac, sweet gum, lilac, persimmon, ash and beech.

Pictures of other common caterpillars can be seen on line at <http://www.ca.uky.edu/entomology/entfacts/ef008.asp>.

LAWN & TURF

Gray Leaf Spot Activity

By Paul Vincelli

For managers of perennial ryegrass, this is a good year to be prepared to make fungicide applications against gray leaf spot. This highly aggressive disease was detected during the week of July 12 on perennial ryegrass fairways in Louisville. The superintendent reports a level of disease activity that normally he doesn't see until mid- to late-August. Given warm, humid conditions that have been prevalent, golf course superintendents and sports turf managers should scout for gray leaf spot activity and consider a fungicide program as needed. This can be a fast-moving and highly destructive disease.



Figure 10. Leaf spot and leaf blighting from gray leaf spot on perennial ryegrass.



Figure 11. Damage to perennial ryegrass fairways from an epidemic of gray leaf spot on perennial ryegrass (Ken Rue photo).

Fungicide options are described in the Extension publication, "Efficacy of Fungicides for Controlling Gray Leaf Spot of Perennial Ryegrass", available online at

http://www.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-OR-T-3.pdf.

Cultural management options are very limited and are described in the UK Extension publication, Chemical Control of Turfgrass Diseases, available at

<http://www.ca.uky.edu/agc/pubs/ppa/ppa1/ppa1.pdf>

FORAGE GRASSES

Cool-Season Forage Grasses Turning Brown

By Paul Vincelli

Samples of orchardgrass and timothy came through the Diagnostic labs last week with overall symptoms of leaf blighting and desiccation, representing fields or areas of fields that were reportedly turning brown and drying up. Analysis by plant pathologists and agronomists suggest there may be a complex of factors that are causing this. Forage agronomists consider drought and heat stress to be playing a significant role in the leaf desiccation. Also, we found moderate to sometimes high levels of two leaf-blighting diseases on both grasses: brown stripe (caused by the fungus *Scolecotrichum graminis*) and anthracnose (caused by the fungus *Colletotrichum graminicola*). Indeed, there may be an interaction of these problems, with diseases attacking drought-stresses grasses.

There is no practical control measure for these diseases and environmental stresses other than:

1. **Selecting well-adapted varieties.** The UK Forage Program has excellent information on variety performance under Kentucky conditions, available at <http://www.uky.edu/Ag/Forage/ForageVarietyTrials2.htm>.
2. **Assuring that soil nutrient status and pH are adequate.** This allows for optimal recovery of the grasses once good growing conditions return.

HOUSEHOLD PESTS

Foreign Grain Beetles – New House Beetles

By Mike Potter

Foreign grain beetles are very small (about 1/16-inch long) brownish insects that are often



Figure 12. Foreign grain beetle view from below (V points to knob).

mistaken for flour beetles or other stored product insects. The key characteristic to look for in identifying this

beetle is the presence of a slight projection or knob on each

front corner of the segment directly behind the head. A microscope or good quality hand lens is necessary to see this character (See Entomology Entfact-610, Foreign Grain Beetle)

<http://www.ca.uky.edu/entomology/entfacts/entfactpdf/ef610.pdf> .

Foreign grain beetles are frequently a problem in new construction (less than 5 years old). They are one of a group of beetles called "fungus beetles" that feed on molds and fungi growing on poorly seasoned lumber or wet plaster and wall board. If they are found infesting flour, grain, or other stored products, the products are generally moldy or in poor condition. When new homes are built, damp wood is often covered with molds or mildew which attracts the beetles. The beetles are also attracted to accumulations of sawdust trapped behind walls during construction. Eggs are laid on this food material and the larvae develop on the surface fungi. The adult beetles usually become a problem in late summer when they move out of wall voids and are attracted to windows and lights. In older homes, foreign grain beetles can also be associated with plumbing leaks, condensation problems, or poor ventilation.

There is no fast or easy way to get rid of foreign grain beetles. Control is difficult because the breeding source of the beetles is concealed within the walls. The ultimate solution is time

and patience. Most new homes dry out naturally within the first few years and the fungi and molds disappear along with the beetles. Drying time can be enhanced by increasing ventilation, e.g., by use of fans and air conditioning. A vacuum cleaner can be used to remove beetles emerging from hidden locations. Pest control companies may be able to provide limited relief by locating the infested wall areas or source of dampness (usually in the rooms where the beetles are most abundant), and injecting residual aerosols or dusts into cracks and crevices beneath baseboards and into the wall voids.

If the homeowner can tolerate the emergence of the adult beetles during August-September, the problem will usually resolve itself. Most newly-built houses cease to have problems after a few summers, and the beetles usually will not be evident during the rest of the year. Some comfort can be taken in the fact that foreign grain beetles are only a nuisance by their presence. They do not bite or damage wood, fabric or stored foods in a sound condition.

Late Summer Invaders

By Lee Townsend

A number of insects become adults in late summer and may be attracted to window or porch lights, ultimately ending up indoors as accidental invaders. Here are a few that will be active over the next few weeks. In general, they are only temporary nuisances that can be discarded without the need to mount a major control effort.



Figure 13. Asiatic oak weevil.

The Asiatic oak weevil is about 0.3 inches long with a short broad snout. This insect often is associated with red oak but will feed on the

foliage of a range of trees, including red maple. These green-gray beetles have elbowed antennae and large eyes. Active in July and August, they are attracted to lights and can wander indoors.

The black turfgrass ataenius is a small black beetle with hidden antennae that has been coming to lights recently. The larvae, small white grubs, are most common in well-water grass with a high organic matter content.



Figure 14. Black turfgrass ataenius.

Exclusion is the best way to deal with these insects. Reduce attraction by using yellow bulbs in outdoor lights, keep screens closed, and check that door sweeps are fitting snugly.

DIAGNOSTIC LAB HIGHLIGHTS

By Julie Beale and Paul Bach

Recent agronomic samples in the PDDL have included gray leaf spot and common rust on corn; frogeye leaf spot and potassium deficiency on soybean; brown stripe and anthracnose on orchardgrass and timothy; black shank, hollow stalk, soreshin, and frogeye leaf spot on tobacco.

On fruit and vegetable samples, we have diagnosed cedar-apple rust on apple; brown rot and scab on peach; *Coccomyces* leaf spot on cherry; anthracnose and *Pythium* stem rot on bean; bacterial leaf spot on pepper; *Phytophthora* crown rot on rhubarb; anthracnose and *Alternaria* leaf blight on cantaloupe; anthracnose on cucumber; black mold and bacterial soft rot on onion; early blight, bacterial speck and anthracnose on tomato.

On ornamentals and turf, we have seen Alternaria leaf spot on geranium; Phytophthora crown rot on liriopse; Pythium root rot on petunia; flea beetle damage on chrysanthemum; Cercospora leaf spot hydrangea; Rhizosphaera needlecast and Stigmata needlecast on spruce; Phyllosticta leaf spot on ash; blight on American chestnut; anthracnose on elm; Botryosphaeria canker on willow; Actinopelte leaf spot on oak; fire blight on ornamental pear and crabapple; summer patch on bluegrass; anthracnose and brown patch on bentgrass.

INSECT TRAP COUNTS

July 23-30

Location	Princeton, KY	Lexington, KY
Black cutworm	11	9
Armyworm	11	19
Corn earworm	61	21
European corn borer	3	2
Southwestern corn borer	17	0
Fall armyworm	1	0

Graphs of insect trap counts for the 2010 season are available on the IPM web site at - <http://www.uky.edu/Ag/IPM/ipm.htm>.
View trap counts for Fulton County, Kentucky at - <http://ces.ca.uky.edu/fulton/InsectTraps>