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University of Kentucky – College of Agriculture

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KENTUCKY PEST NEWS

ENTOMOLOGY · PLANT PATHOLOGY · WEED SCIENCE

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CORN

European Corn Borer Emerging
By Ric Bessin

The moths of the first generation European corn borer are beginning to emerge in western Kentucky with the rest of the state to follow shortly. With much of the corn crop planted late this year, growers will need to watch the late planted crop carefully for corn borer activity as late planted corn is more vulnerable to losses by this generation. Fortunately, much of the late planted corn has Bt for corn borer control. Pepper producers will also need to begin corn borer management with the onset of the second generation larval emergence. It is the second generation during mid summer that attacks under the cap of the fruit to destroy the pepper. Controls for corn borers are preventative in that the larvae must be controlled before they get into the fruit. See the accompanying chart for relative degree day accumulations at various Kentucky locations.

Figure 1. European corn borer moth.

LOCATION	(6/23) CURRENT DD TOTAL	1st Gen moths 1660DD	2nd Gen larvae 1860DD
Bardstown	1478	6/28	7/6
Berea	1276	7/6	7/14
Bowling Green	1516	6/26	7/5
Buckhorn Lake	1318	7/5	7/13
Campbellsville	1321	7/4	7/12
Covington	1195	7/10	7/18
Cumberland Gap	1328	7/4	7/12
Dix Dam	1230	7/8	7/16
Glasgow	1624	6/22	6/30
Grayson	1259	7/7	7/15
Hardinsburg	1354	7/3	7/11
Henderson	1355	7/3	7/10
Jackson	1311	7/5	7/13
Lexington	1239	7/8	7/16
London	1325	7/4	7/12
Louisville	1313	7/5	7/13
Mayfield	1322	7/4	7/12
Paducah	1554	6/25	7/3
Princeton	1639	AO	6/29
Quicksand	1315	7/5	7/13
Somerset	1378	7/2	7/10
Spindletop	1280	7/6	7/14
Williamstown	1187	7/10	7/18

TOBACCO

Update on Blue Mold, Black Shank, and Target Spot
By Kenny Seebold

As of June 22, blue mold has been found in two counties in southeastern Pennsylvania (Chester and Lancaster). Disease has not spread significantly beyond the areas that were reported to have been affected originally.

Over the past week, there has been little chance of spore movement from the Pennsylvania sources into Kentucky and surrounding areas. The overall blue mold risk is fairly low through the beginning of next week. Thus, I don't think we need make fungicide applications for controlling blue mold at this time. If the situation changes, we'll post an alert through the Kentucky Blue Mold Warning System and on the Kentucky Tobacco Disease Information Page (www.uky.edu/Ag/KPN/kyblue/kyblue.htm). As always, since we all know that blue mold manages to crop up in the most unexpected places, please continue to watch for blue mold and report any suspected finds as quickly as possible.

On another note, we have begun to see a little black shank and target spot crop up. With regard to black shank, the best lines of defense are good management practices, planting a variety with good resistance to disease, and applications of mefenoxam (Ridomil Gold SL or Ultra Flourish). Mefenoxam products perform well when applied prior to or just after setting, particularly when a variety with good resistance is employed. What fungicide options are available to the producer who did not put down mefenoxam prior to setting? Syngenta Crop Protection recently released Ridomil Gold SL, which has replaced the EC formulation of this product. The labeled for the SL formulation of Ridomil Gold differs from that of the EC in that applications of the fungicide are now permitted at 1st cultivation and layby even if a pre-plant application was not made. Thus, Ridomil Gold SL can be used in situations where black shank appears after setting. These "rescue" applications will be most effective if a variety with moderate-to-high levels of resistance has been planted, such as 'KT 204' or 'KT 206'. The rate for Ridomil Gold is 1-2 pt/A if the fungicide will be applied at1st cultivation only; two treatments at 1 pt/A each can also be made at 1st cultivation and layby. Applications should be directed at the soil and stems of plants for best control of black shank. The fungicide should be incorporated as quickly after application as possible, either mechanically or by irrigation (natural rainfall or overhead irrigation). Soils need adequate levels of moisture to activate mefenoxam and permit its uptake into the plant. Secondary spread of black shank is considerably less likely in a drought than in rainy weather; however, heavy rains or irrigation could result in heavy losses to black shank in fields with even low levels of disease, so mefenoxam should be applied in advance of anticipated moisture events. The black shank pathogen can be moved easily on equipment and feet! Growers need to sanitize properly when moving between infested and clean fields.

With regard to target spot, our most effective control for those who face serious losses to this disease is Quadris fungicide. Timing of fungicide application is critical to good success with this product against target spot. We know from previous research that an early (around layby) application of Quadris at 8 fl oz/A allows for good coverage and suppression of disease at a time when disease levels are likely to be low, and this helps prevent buildup later. This point is important, because low levels of target spot early in the season can lead to large-scale outbreaks after the crop grows to the point that row middles are shaded. Also, complete coverage (important with Quadris since it is only a local systemic) is more difficult on larger tobacco, so we like to see an early application to get a baseline level of fungicide in place before the crop grows to a size that is more difficult to spray. In many cases, a single application of Quadris will give good control of disease; however, if symptoms appear as we near topping, a second application at 8 fl oz/A (10-12 fl oz if pressure is high) will ensure control of disease as the crop matures prior to harvest. According to the label, we can apply up to 31 fl oz/A of Quadris per season; however, most growers will need no more than 2 applications at 8 fl oz/A. In certain high-pressure situations, we might need a third application; Quadris can be applied up to the day of harvest, although we would rarely see a need to put out this

product at such a late stage. As with all fungicides, please consult the label for detailed information on rates, safety precautions, and resistance management.

SHADE TREES & ORNAMENTALS

Dogwood Powdery Mildew
By John Hartman

Flowering dogwoods (*Cornus florida*) in many landscapes are showing symptoms and signs of powdery mildew. This disease, first noticed in the mid-1990's has been active in Kentucky for more than a decade. The development and buildup of symptoms and signs is consistent with previous years' experiences, however this year, the disease is appearing earlier and seems to be more severe than usual. Considering the lengthy periods of high humidity seen in Kentucky this springand early summer, it shouldn't be surprising that powdery mildew is more prevalent.

Cause. Dogwood powdery mildew is caused mainly by the fungus *Erysiphe pulchra* (formerly *Microsphaera pulchra*), but a related, but different fungus, *Phyllactinia guttata*, can also be found on diseased dogwoods in Kentucky. Powdery mildews are obligate parasites and fungus development is favored by fresh, succulent plant growth and high humidity conditions. Unlike many foliar diseases, powdery mildew is not dependent on wet leaves for infection and spread. The fungal signs present for most of the season are those of the asexual *Oidium* stage which produces microscopic chains of white conidia. On leaves late in the season and on fallen leaves in fall and winter, ascocarps (cleistothecia, the sexual stage) resembling tiny dark dots embedded in the mildew can be observed. Microscopic characters of these cleistothecia are used to differentiate *E. pulchra* from *P. guttata*. It is thought that the powdery mildew caused by *E. pulchra* is a new disease, possibly introduced from Asia on infected plants in the 1990's.

Symptoms and signs. On susceptible dogwoods, affected parts of leaves develop a mottled yellowing or turn light green or yellow (Figure 2). Yellowed leaves may fall. In some cases, a very light coating of the causal fungus can just barely be seen (Figure 3), and occasionally, small patches of the fungus are fairly visible. Often the disease begins as barely distinguishable reddish brown or purplish irregular blotches on dogwood leaves which then develop into dark brown to tan dead patches(Figure 4). Later in the season, the tips and edges of infected leaves may be scorched, cupped, and drooped (Figure 5), with badly infected leaves falling prematurely. Throughout the season, the typical white powdery mildew mycelium and spores may develop abundantly on new growth, distorting and curling these youngest leaves (Figure 6). It is likely that many of these curled leaves will later become scorched or develop dead patches. The disease increases progressively from early June to early September. Severely affected trees may appear wilted and browned by late summer (Figure 7). Landscape dogwoods exposed to sunlight and dry soil conditions may be especially scorched.

Figure 2. Dogwood leaves fading and yellowing due to powdery mildew disease.

Figure 3. Sparse growth of powdery mildew fungus on leaf surface (under low magnification).

Figure 4. Dead patches on dogwood leaves due to powdery mildew.

Figure 5. Late summer scorched and curled dogwood leaves due to powdery mildew.

Figure 6. White superficial mycelium and spores, signs of powdery mildew on new dogwood shoot growth.

Figure 7. Mildew-infected (right) and healthy (left) dogwoods in late summer.

How powdery mildew affects dogwoods. Although it probably weakens trees, powdery mildew does not appear to be lethal. We have observed that under high disease pressure, flower production is decreased the following year. Powdery mildew reduces plant photosynthesis and increases leaf water loss through disruption of the cuticle and through the superficial fungal mycelium. In the long run, this could weaken trees making them more prone to dogwood borer or Botryosphaeria canker. Most landscape dogwoods are grown from seedling sources, so the mildew susceptibility of individual dogwood trees in landscapes varies greatly.

Disease management. Powdery mildew can be confronted by using cultural practices, planting resistant dogwoods, and by using fungicides.

- Avoid cultural practices that stimulate succulent growth and encourage powdery mildew. These include applying nitrogen fertilizer, pruning heavily, and irrigating excessively.
- Use good cultural practices such as mulching over the root system, pruning out dead branches, and providing good air movement and light penetration by judicious pruning of nearby vegetation.
- Plant dogwood species and cultivars resistant to powdery mildew.
    - Susceptible: All *Cornus florida*, seedling wild types (but individuals vary in susceptibility) and most *C. florida* cultivars.
    - Intermediate susceptibility: *C. florida* 'Cherokee Brave' and cultivars of the *C. florida* x *C. kousa* hybrids.
    - Resistant: Four powdery mildew resistant *C. florida* cultivars have been developed by the Tennessee Agricultural Experiment Station and are available in the nursery trade. They include 'Jean's Appalachian Snow', 'Karen's Appalachian Blush', 'Kay's Appalachian Mist', and 'Appalachian Joy'. Also resistant: Cultivars of *C. kousa*, oriental dogwood.
    - Immune: Cornelian cherry dogwood, *C. mas*.
- If fungicides are to be used, determine which trees in the landscape are most susceptible so that applications are not made unnecessarily. Those trees most at risk for powdery mildew disease then can be considered for preventive fungicide applications. Most fungicides are capable of stopping the progress of powdery mildew infections fairly quickly, but none will restore already discolored or damaged leaf tissues. Good control can be obtained with as few as four fungicide applications made three weeks apart. Begin applications at the end of May.
  Effective fungicides include:
    - azoxystrobin (Heritage)
    - fenarimol (Rubigan)
    - myclobutanil (Eagle, Immunox, Procoz Hoist)
    - propiconazol (Banner Maxx, Procon-Z, Procoz Fathom, Propensity)
    - thiophanate-methyl (Cleary's 3336)
    - triadimefon (Bayleton, Strike)

  Powdery mildew fungicides requiring more frequent applications to be effective include:
    - neem oil (Triact)
    - potassium bicarbonate (Bonide Remedy, FirstStep, Kaligreen, Milstop)
    - paraffinic oil (Sunspray UF Oil)

When using fungicides for powdery mildew management, be sure that dogwoods are listed on the label and carefully follow all label directions.

LAWN & TURF

Patch Diseases in Kentucky Bluegrass
By Paul Vincelli

Kentucky bluegrass growing in Kentucky commonly suffers from two diseases collectively known as "patch diseases". Necrotic ring spot and summer patch are two similar diseases caused by root-infecting fungi. Symptoms of these diseases are not generally distinguishable: both produce circular, irregular or arcs of wilting and dead turf, sometimes with a tuft of healthy grass in the center of the patch (Figs. 8-10). In Kentucky bluegrass, symptoms of necrotic ring spot generally first show up in late May through June, whereas summer patch symptoms more commonly occur in July and August. These symptoms can be more pronounced on sodded lawns where the soil was not prepared properly before sodding, though they may take several years to show symptoms.

Not all dead patches in Kentucky bluegrass appearing during summer are necrotic ring spot or summer patch disease. There may be other causes for similar symptoms, including *localized dry spot*. This condition is not an infectious disease, but rather a condition where patches of soil become hydrophobic and repel water, even when rainfall is adequate. Grass plants in these patches suffer from drought stress. Check the soil for evidence of dryness following rainfall or irrigation.

Management
Close mowing has been shown to aggravate summer patch. Kentucky bluegrass lawns are normally mowed between two and three inches. Keep a relatively high mowing height in lawns where summer patch develops. Raising the mowing height promotes healthier turf with better root development and higher levels of nutritional reserves needed for stressful periods.

If planting or sodding, start with a variety that performs well in soils infested with the fungi that cause these diseases. University of Kentucky variety trials are conducted on such sites, so stick with varieties listed as the top performers in UK tests. (See http://www.uky.edu/Agriculture/ukturf/top_varieties.htm.)

Sustained use of acidifying nitrogen fertilizers such as ammonium sulfate, ammonium chloride, or sulfur-coated urea as a nitrogen source can reduce the severity of summer patch. Avoid nitrate-containing fertilizers for these sites, since that can enhance disease pressure. A long-term fertilization program with ammonium fertilizers or sulfur-coated urea can increase the acidity of the soil (lower the soil pH), which creates an inhospitable soil environment for *M. poae*. This effect is probably not as pronounced in high-clay soils or soils receiving a great deal of irrigation each season, but it may be beneficial in many Kentucky landscapes. If the lawn receives fertilizer during hot weather, choose a fertilizer with low burn potential, such as sulfur-coated urea.

I discourage the use of fungicides for these diseases in lawns and landscapes. If these diseases continue to cause an unacceptable level of damage even after implementing cultural management practices, a better solution is to interseed perennial ryegrass into affected areas (to mask the symptoms) or renovate to a non-susceptible grass species like tall fescue.

Figure 8. Necrotic ring spot on Kentucky bluegrass.

Figure 9. Necrotic ring spot of Kentucky bluegrass.

Figure 10. Summer patch of Kentucky bluegrass.

HOUSEHOLD

Ant Wars
By Mike Potter

Ants are the most frequent and persistent pests encountered around homes and buildings. Besides being a nuisance, they contaminate food, build unsightly mounds on clients' property, and cause structural damage by hollowing out wood for nesting.

To most householders, all ants look pretty much the same. In truth, dozens of different species occur around homes and buildings, each having unique characteristics, which may influence the method of control. In Kentucky, the most common household-invading ants include pavement ants, carpenter ants, acrobat ants, and odorous house ants. The latter ant species has become a *huge* problem in recent years, causing fits to householders and pest control professionals alike. Knowing which ant(s) you have often requires the help of an entomologist or knowledgeable pest control firm. Collecting a few of the non-winged worker ants in a plastic bag or vial will help with subsequent identification.

Dealing with ants can be very frustrating. The following recommendations pertain to all common structure-invading ants in Kentucky except carpenter ants, which will be discussed in a subsequent newsletter. For additional information, see entomology publication, *Ant Control for Homeowners (Entfact- 619).*

THE BATTLE PLAN

The mistake most people make when trying to control ants is only spraying the ones they see. This approach usually fails because the ants seen foraging over exposed surfaces are only a small portion of the colony. Typically, there will be thousands of additional ants, including one or more egg-laying queens hidden somewhere in a nest. Eliminating queens and other colony members within nests is often the key to effective control.

ANTS NESTING INDOORS

Buildings contain many favorable hiding and nesting sites for ants. Preferred sites include spaces behind walls, cabinets, or appliances; behind window and door frames; or beneath floors and concrete slabs. Most of these areas are hidden, making it difficult to determine their precise location. When the location of the nest cannot be determined or are inaccessible, insecticide baits often are a good option, especially for homeowners. The advantage in using baits is that foraging ants take the insecticide back to the nest and feed it to the queen(s) and other colony members. As a result, the entire colony often is destroyed.

Most baits sold to homeowners come pre-packaged with the insecticide and food attractant confined within a plastic, child-resistant station. Some of the more effective ant baits sold in grocery, hardware and retail stores are Combat Quick Kill® Formula bait stations and Combat Ant Killing Gel; Raid Ant Bait II, and Terro® Ant Killer II.

Place the baits next to wherever ants are seen, preferably beside ant "trails" — invisible odor trails that worker ants follow between food and the nest. Do not spray other insecticides or cleaning agents around the baited locations as this will deter ants from feeding on the bait. Initially you should see an increase in the number of ants around the bait station. *Do not spray them.* This indicates that the ants are feeding on the bait and transporting the insecticide back to the nest. Ant activity often will subside in a matter of days as the number of ants in the colony declines. Continue to place additional baits wherever ants are seen.

Ants are rather finicky in their food preferences and may alter them throughout the year. If one bait product isn't attractive or doesn't seem to be working, try another. Optimal results usually require a sustained period of feeding, not just a brief visitation by a few ants. Professional pest control firms have a wider selection of products to choose from, and can usually provide relief when homeowner efforts are unsuccessful. Retail baits usually *will not* control carpenter ants, although the Combat® Ant Killing Gel or Terro® baits may be worth a try.

ANTS NESTING OUTSIDE

Ants noticed inside the home may actually be nesting outdoors in the yard. Try to trace the ants

back to the point where they are entering from outside; this may be along a windowsill, beneath an entrance door, or where the exterior siding meets the foundation wall. Ants usually prefer to trail along lines and edges. When tracing ant trails indoors or outdoors, pay particular attention to seams and edges created by baseboards, the tack strip beneath perimeter edges of carpeting, mortar joints, foundation/siding interface, etc. Nests often will be located in the ground, marked by a mound or anthill. Other times, the nest will be concealed under stones, mulch, landscaping timbers, pavement, or beneath grass adjoining the foundation wall. Some kinds of ants prefer to nest behind exterior siding or wood trim that has been damaged by moisture. While it takes patience to locate an ant colony outdoors, results will be more permanent than if you spray only where ants are seen trailing. One way to entice ants to reveal the location of their nest(s) is to place small dabs of honey or jelly next to where ants are observed. After the ants have fed, they will head back to the nest.

When a belowground nest is discovered, the colony can often be eliminated by spraying or drenching the nest location with a liquid pyrethroid insecticide such as Spectracide Triazicide®, Ortho Home Defense Max®, or Bayer Advanced® Lawn & Garden Multi-Insect Killer. Large colonies will require greater amounts of liquid to move the insecticide throughout the network of underground galleries within the nest (using a bucket to apply the diluted insecticide is an effective method). Follow label directions for treating ant mounds, paying attention to precautions for mixing and application. Another effective and convenient way to control some species of outdoor and indoor-nesting ants is with a granular bait product, such as Combat® Ant Killing Granules. Sprinkle the bait in small amounts beside outdoor ant mounds, along pavement cracks, and other areas where ants are nesting or trailing.

Ant entry into homes can be reduced by caulking around door throesholds, windows, and openings where utility pipes and wires enter buildings. Ant entry can be further reduced by spraying one of the above-mentioned liquid insecticides around the outside perimeter of the building. Consider applying a 2-to 6-foot swath along the ground adjacent to the foundation, and a few feet up the foundation wall.
Also treat ant trails and points of entry into the home, such as around doors and where utility pipes and wires enter from outside.

In Kentucky, spraying or applying granular insecticides to the entire yard is not recommended, and will seldom if ever, solve an ant infestation indoors. Whole-yard treatments also eliminate beneficial ants, which help to keep other damaging pests of lawns and gardens in check.

BATTLING ODOROUS HOUSE ANTS

The odorous house ant has become the most common and difficult ant species to control in Kentucky and throughout much of the United States. The ant is small (1/8-inch), darkish, and forms distinct trails along outdoor and indoor surfaces. It is often mistaken for the pavement ant, which can readily be controlled with most baits. The most accurate diagnostic difference, visible under magnification, is the absence of a noticeable "bump" (node) along the constricted area between thorax and abdomen of the odorous house ant. Pavement ants have two obvious nodes, and fine grooves or striations along the head and thorax. Pavement ants also are more likely to displace bits of soil from their typical nesting location under sidewalks, driveways and other paved areas. Odorous house ants emit what's been described as a rotten coconut or pine scent when crushed with the finger and sniffed.

Odorous house ants will nest in almost every imaginable location. They commonly nest outdoors under pavement, stones, mulch, woodpiles, flowerpots, and house siding, foraging indoors for food and moisture. Nests also occur indoors within wall cavities, appliances, potted plants, etc., especially near sources of moisture. The nests tend to be mobile; colonies relocate fast and often in response to changes in weather and disturbance. Odorous house ant colonies usually have numerous, egg-laying queens and the primary colonies may split into smaller ones for no apparent reason. Ants foraging indoors feed on all manner of foods, ranging from the trash can to the cereal bowl.

This particular ant is VERY DIFFICULT to control, especially by householders. The better baits to try are often syrupy ones, such as Combat® Ant Killing Gel or Terro® Ant Killer II. As with all ants, activity indoors can sometimes be reduced by removing ready access to food and moisture (water leaks, spillage, trashcans, pet food dishes, etc). Temporary relief can sometimes be had by wiping away the invisible odor trails with a kitchen cleanser or mild detergent. Do not disturb foraging trails, however, if you are using bait. Caulking obvious ant entry points also may be helpful, along with trimming back shrubs and limbs touching the building. In nature, this ant feeds extensively on plant nectar and honeydew excreted by plant-sucking insects such as aphids.

When odorous house ants are the problem, homeowners may be better off calling a professional, although they, too, are challenged by this ant. Some products used by professionals (e.g. Termidor®/Phantom® sprays, certain baits) can be effective, but are not available to the public.

DIAGNOSTIC LAB HIGHLIGHTS

By Julie Beale and Paul Bachi

Recent agronomic samples in the PDDL have included potassium deficiency on corn; Lepto leaf spot and Phytophthora root rot on alfalfa; black shank, chemical injury, Pythium root rot, tobacco streak virus, tomato spotted wilt virus, and symptoms of transplant shock on tobacco.

On fruit and vegetable samples, we have diagnosed iron deficiency on blueberry; black rot on grape; bacterial spot, leaf curl, scab and freeze injury on peach; fire blight, cedar-apple rust, frogeye leaf spot and scab on apple; Rhizoctonia root/stem rot and Pythium root rot on bean; black rot on cabbage; anthracnose and Alternaria leaf blight on cucumber; Rhizoctonia root/stem rot on pepper; early blight, bacterial canker, bacterial spot, Pythium root rot, Rhizoctonia stem rot, Fusarium wilt and timber rot on tomato; and Pythium root rot on watermelon.

On ornamentals and turf, we have seen downy mildew on sunflower; Alternaria leaf spot and impatiens necrotic spot virus on impatiens; Phoma canker and dieback on vinca; rosette disease on rose; Phytophthora leaf blight on rhododendron; leaf/flower gall on azalea; winter injury, leaf miner injury, and Volutella canker on boxwood; scab and frogeye on crabapple; bacterial leaf spot on cherry and plum; anthracnose on ash; Phyllosticta leaf spot on maple; Phloeospora (fungal) leaf spot on mulberry; tar spot on tuliptree; Phytophthora root rot on fir, hemlock and juniper; take-all patch on bentgrass; and Pythium root dysfunction on ryegrass.

INSECT TRAP COUNT
June 12-19

By Patricia Lucas

Location	Princeton, KY	Lexington, KY
Black cutworm	7	12
Armyworm	98	59
Corn earworm	18	17
European corn borer	0	0
Southwestern corn borer	36	0
Fall armyworm	0	0

Graphs of insect trap counts for the 2008 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://ces2.ca.uky.edu/fulton/InsectTraps

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