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KENTUCKY PEST NEWS

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CORN

Preventive Insecticide Sprays for Corn Discouraged

By Ric Bessin

Initially some growers began spraying fungicides preventively on corn, now some are considering adding an insecticide to the mix. I am recommending that growers NOT apply insecticide preventively without scouting information to justify their need. Pest populations must be above an economic threshold in order for the use of an insecticide to be justified. Simply breaking even economically should be the goal of using an insecticide, growers should manage their insecticide applications such that they return a profit on their investment.

Unnecessary use of insecticides has the potential to cause more harm than good, as non-target insects will also be impacted. This includes depletion of natural enemies of the pests and insect pollinators. These natural enemies are working to reduce the magnitude of pest problems we encounter. Reducing the number of natural enemies may allow pest populations to increase more rapidly in the future.

Pest populations vary from field to field and from year to year. In addition to pest populations varying in time and space, corn that is in different stages of growth will also vary in attractiveness to egg laying by insect pests. So planting date of a particular field and those around it will play key roles in determining which fields are more or less attractive to the pests and likely to develop 'treatable' infestations. Individual field should be scouted to determine the level and stages of insect pests. Keep in mind that there are stages of the pests that are vulnerable to insecticide applications, and stages that are protected from sprays.

Five reasons to only use insecticides in corn when pests exceed economic thresholds:

- To get a positive economic return on the use of insecticides sprays.
- To avoid unnecessary losses to natural enemies of pests.
- To avoid unnecessary losses to insect pollinators during pollen shed.
- To delay/prevent the development of insecticide resistance.
- Most of the corn is already protected from late-season lepidopteran pests through BT technology, particularly late-planted corn.

Scouting guidelines and economic thresholds are available through the Kentucky IPM website (http://www.uky.edu/Ag/IPM/ipm.htm). Use of scouting and thresholds has been shown to be the most economical approach on average and is strongly encouraged. This year, growers should be keeping a close eye on southwestern corn borer and European corn borer populations, particularly in late planted fields, over the next four to five weeks.

Fungicide Considerations for Corn in 2009
By Paul Vincelli

Interest continues in the possible use of fungicides for field corn in Kentucky during this growing season. As far as disease-control products, the strobilurins (Table 1) continue to be the strongest products. They generally provide very good to excellent control of gray leaf spot and northern leaf blight, our most common foliar disease threats in Kentucky. They also are good against southern rust and common rust. However, southern rust typically comes in too late to threaten the large majority of Kentucky corn crops, and corn hybrids in Kentucky typically have high enough levels of resistance to common rust that it does not affect yield. Thus, fungicide applications are very commonly unnecessary against the rust diseases in Kentucky corn. Of course, a long list of other diseases can attack corn: anthracnose, various stalk rot diseases, ear rots, kernel rots, common smut, Stewart's wilt, the virus complex, brown spot, northern leaf spot, Holcus spot, etc. With rare exceptions, these fungicides will do little to nothing against these other diseases. In Kentucky, by far the most important use of foliar fungicides is to control gray leaf spot and, where it occurs, northern leaf blight.

Fungicide	Active ingredient(s)	Chemical class(es)
Headline	Pyraclostrobin	Strobilurin
Quadris	Azoxystrobin	Strobilurin
Quilt	Azoxystrobin + propiconazole	Strobilurin + triazole
Stratego	Trifloxystrobin + propiconazole	Strobilurin + triazole

Table 1. Fungicides commonly being used in corn production throughout the U.S.

Personally, based on university research, I think there are many corn fields that will produce optimal yields without fungicides. However, I realize that sales pressure makes that kind of thinking sound so "twentieth century". Some fungicide sales reps are telling growers that they can find gray leaf spot and rust in every field they scout. It's not surprising to find these diseases in corn fields, but that doesn't mean they will develop into serious threats. In fact, common rust is commonly widespread in corn at this time of year, but hybrids typically have enough resistance to keep that disease a mere curiosity. Gray leaf spot can develop into a serious threat, but how much gray leaf spot develops depends on lots of things.

The risk factors for gray leaf spot are listed in Figure 1. The more of these that are in place in a field, the higher the risk of disease and, therefore, the more likely the producer is to see a positive economic response from a fungicide. If a grower is considering making a fungicide application, do so to the fields with the highest risk of disease.

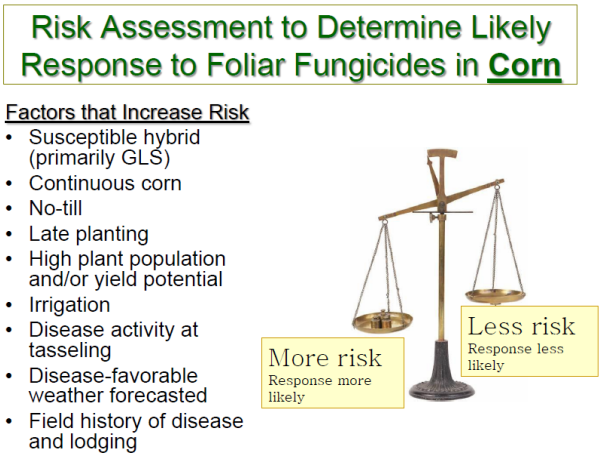

Figure 1. Risk factors for gray leaf spot of corn. For the most part, the same risk factors apply to northern leaf blight as well.

As indicated in Figure 1, gray leaf spot activity at tasseling is a risk factor. But how much gray leaf spot is enough to trigger concern? Is one lesion in a 20-acre field enough? Well, no, it's not. The fungicide guidelines being offered by several universities in the Midwest are as follows:
For susceptible or moderately susceptible hybrids, a fungicide application should be considered if the disease is present on the 3rd leaf below the ear or higher on 50% of the plants before or at tasseling.

For intermediate hybrids, fungicide application should be considered if conditions and factors are favorable for disease and if disease is present on the 3rd leaf below the ear or higher on 50% of the plants before or at tasseling.
For resistant hybrids, a fungicide application is generally not recommended, but field scouting is still important in order to determine if a highly unusual disease outbreak is occurring.

Some producers are asking if an insecticide should be included with the fungicide application on corn, instead of an adjuvant. UK entomologists respond that an insecticide should be used only if there is a specific threat from insect pests. Routinely including an insecticide in the corn fungicide application is costly, wasteful, and environmentally damaging if there is no specific insect threat in that field.

One of the corn fungicides—Headline®—is being marketed as a plant growth promoter in addition to a fungicide. Claims for this product include increased growth efficiency and improved stress tolerance. While these things are apparently possible in some cases, university research indicates that they occur unpredictably and not often enough to use the product purely as a growth promoter.

Bottom line: The best advice I can give is to consider carefully whether a fungicide is needed in your corn fields, and to base the decision to treat on the risk of gray leaf spot, as well as on Northern leaf blight if it occurs. Many times fungicides aren't necessary. Always leave several untreated strips and compare yields with a yield monitor, to see how much benefit, if any, the fungicide gave you.

FORAGE

Blister Beetle – What Hay Producers and Buyers Need to Know
By Lee Townsend

Here are some key points about blister beetles –

- Blister beetles occur throughout the US – they are a potential problem in most all hay-production areas but risk varies greatly from area to area and year to year.

- Blister beetle toxicity is caused by cantharidin, a defensive compound that occurs in male blister beetles and is transferred to females during mating. If sufficient numbers of live or dead beetles are consumed, cantharidin irritates the intestinal and urinary tract and can lead to animal death, especially in horses.

- In Kentucky, blister beetles are active from mid-July into early September. They tend to cluster together, especially on flowering plants.

- Clear steps can be taken to eliminate or greatly reduce the potential of blister beetles in hay – 1) Use hay for horses that is cut before blister beetles become active; 2) if practical, cut hay before alfalfa or common flowering plants in the field are in bloom; 3) do not crimp condition hay if many plants are in the bloom stage.

Blister beetles feed on a wide range of plants including alfalfa, clover, soybean, potato, tomato, and eggplant and are especially attracted to flowers. Like the Japanese beetle, feeding by a few blister beetles draws in more. Large numbers of beetles can cluster on small patches of flowering plants in an otherwise uninfested field. This can result in infested hay.

Fields should be checked visually for blister beetles before harvest. Especially flowering plants along field margins should be inspected. Sickle bar mowers and some circular or rotary mowers lay the hay down without crushing many beetles. As the hay cures, the beetles will leave.

Blister beetles have long (3/4" to 1-1/4"), narrow bodies, broad heads, and antennae that are about 1/3 the length of the entire body. The segment behind the head is narrow, so the beetle appears to have a "neck". The front wings are soft and flexible in contrast to the hard front wings of most beetles. The black blister beetle (jet black) and the margined blister beetle (black with thin gray stripe around wing covers) are common species in Kentucky.

Female blister beetles lay clusters of eggs in the soil in late summer. The small, active larvae that hatch from these eggs crawl over the soil surface entering cracks in search for grasshopper egg pods which are deposited in the soil. After finding the egg mass, blister beetle larvae become immobile and spend the rest of their developmental time as legless grubs. Blister beetles will not lay eggs in hay and the larvae do not feed on or develop in hay bales.

SHADE TREES & ORNAMENTALS

Mulches, Mushrooms and Molds

By John Hartman

Mulches are used in Kentucky gardens and landscapes for many reasons. By suppressing vegetation near trees and shrubs, they keep mowers and string trimmers from damaging the bark. In landscape beds and in the garden, they control weeds, improve drainage, prevent soil water loss, lower soil temperatures, prevent soil erosion and, as they decompose they release minerals and leave behind humus which benefits the plants. Organic mulches generally suppress plant pathogenic fungi and enhance beneficial mycorrhizal fungi. For continuing benefits, mulches need to be reapplied periodically. However, mulches are sometimes misused, especially around trees where excessive mulch (volcano mulch) is placed against the trunk, a practice which is harmful to trees (Figure 2).

Figure 2. Landscape mulch piled too high against the tree trunk.

Figure 3. Slime mold growing on mulch and enveloping rose stems.

Recent rains and use of fresh wood chip or bark mulch in Kentucky landscape beds has resulted in a proliferation of nuisance fungi growing in or on the mulch. One that is prevalent now is slime mold (sometimes referred to as "dog vomit fungus") which produces yellow or whitish patches of mold which later turn gray as they dry out. This slime mold spreads over the surface of the landscape mulch, sometimes surrounding the stems of plants in the bed (Figure 3). Although nuisance fungi such as slime mold rarely harm plants, some homeowners and landscapers object to their appearance and thus seek ways to prevent or eliminate these fungi.

There are many examples of fungi that grow on or from landscape mulch. Examples include stinkhorns (*Mutinus* and other related species) (Figure 4), bird's nest fungus (*Crucibularium*) (Figure 5), earth stars (*Geastrum spp*), assorted toadstools, slime molds (*Physarum* and other species), and the shotgun, or artillery fungus (*Sphaerobolus*) (Figure 6). Of these, only the shotgun fungus is truly a nuisance because it shoots tiny black spore masses onto nearby surfaces such as home siding and cars (Figure 7). Fungi also permeate thick layers of dry mulch, creating a hydrophobic mulch which is not easily penetrated by water, thus causing irrigation problems. Fertility problems can result when the fungi decomposing mulch removes nitrogen from the soil which is needed by the plants.

Figure 4. Stinkhorn fungus growing in mulch.

Figure 5. Birds nest fungus resembling tiny eggs in a tiny nest.

Figure 6. Artillery fungus (T. Volk photo).

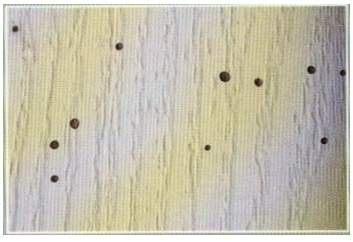

Figure 7. Dark spots on home siding resulting from Artillery fungus (Cornell Univ. photo).

With proper manipulation, mulches can be prevented from developing nuisance fungi while maintaining the benefits of mulch. Much work on microbes and mulch has been done at Ohio State University where they have found that hardwood mulches (commonly used in Kentucky), especially if finely ground, contain a large amount of cellulose which decomposes fairly rapidly and leads to nuisance fungi. Such mulches, if composted for a few weeks with added nitrogen, and maintained at moisture levels over 40%, will not develop nuisance fungi. Such moisture levels allow bacteria and other fungi to compete with the nuisance molds. Wet mulches are heavy and require more effort to transport; however, moisture contents of organic products up to 50% will not present excessive transport weight problems.

The following are suggestions for the landscape industry and for homeowners wishing to avoid nuisance fungi:

- Purchase composted mulch products.
- Use mulches low in wood and high in bark.
- Avoid finely ground woody products unless composted first.
- If using fresh wood chips such as those from a tree maintenance firm, add water to the mulch and allow the pile to partially compost for six weeks. If the wood chips do not include fresh leaves, add some nitrogen to speed composting.
- Use coarse mulches, but do not apply them too deep.
- Soak all mulches with water immediately after application to enhance bacterial colonization.
- Do not apply mulch deeper than two inches.
- Do not use sour mulches (highly acidic mulches giving off an acrid odor) because they injure plants.

An informative publication, "Using Mulches in Managed Landscapes" describing use of landscape mulch and potential problems can be found at: http://www.extension.iastate.edu/Publications/SUL12.pdf.

Euonymus Scale – Obvious but Tough to Control
By Lee Townsend

Euonymus scale is one of the most distinctive armored scales in the landscape. It attacks Euonymus, Pachysandra, and Bittersweet; hundreds may be encrusted on foliage. Impacts can include reduced photosynthesis, stunted plants, premature leaf drop, and death of parts or all of a plant. Often the samples that are sent for identification are so heavily infested that the prospects for control are not encouraging.

A good first step is to prune and destroy as many heavily infested branches as possible. Chemical control of armored scales must be directed at the crawler stage, late May and again in late July for this species. Thorough spray coverage is needed for best results, it may take two or more growing seasons to have a visible impact – limited infestations on new foliage. More information is available in http://www.ca.uky.edu/entomology/entfacts/entfactpdf/ef428.pdf.

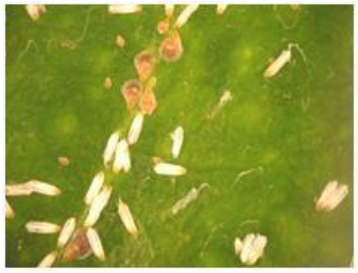

Figure 8. Euonymus scale - females - dark, pear-shaped; males - white, long and narrow.

HOUSEHOLD

Mosquito Options for Householders
By Mike Potter

With the abundance of warmth and moisture, mosquito season is in full swing throughout the Commonwealth. Mosquitoes are a perennial nuisance for which there is no easy answer. As summer continues, there will be lots of information (both good and bad) about what works and what

doesn't. The following measures can afford some relief.

Eliminate Breeding Sites – Mosquitoes need quiet, non-flowing water for their development and periodic summer storms provide just such conditions. Eliminating large sources of standing water may require community-wide effort. Nonetheless, homeowners can take steps to prevent mosquitoes from breeding on their property:

1. Dispose of old tires, buckets, aluminum cans, plastic sheeting or other refuse that can hold water. Empty accumulated water from trashcans, boats, wheelbarrows, pet dishes, and flowerpot bottoms, and if possible turn them over when not in use.

2. Clean debris from rain gutters and unclog obstructed down spouts. Clogged or damaged rain gutters are one of the most overlooked mosquito breeding sites around homes.

3. Change water in birdbaths and wading pools at least weekly, and keep swimming pools clean, chlorinated or covered when not in use. Ornamental pools can be aerated or stocked with mosquito-eating fish. Aeration and water movement helps because mosquitoes prefer quiet, non-flowing water for egg laying and development.

4. Fill or drain ditches, swampy areas, and other soil depressions and remove, drain or fill tree holes and stumps with mortar to prevent water accumulation. Eliminate standing water and seepage around animal watering troughs, cisterns, and septic tanks. Be sure cistern screens are intact and access covers fit tightly.

Larval Control - Use of a mosquito larvicide can be beneficial when it is impractical to eliminate a breeding site. Larvicides are insecticides used to control immature mosquitoes before they have a chance to develop into biting adults. Most larvicides sold to homeowners contain either the ingredient methoprene, or the bacterium Bacillus thuringiensis israelensis (Bti). Neither active ingredient is harmful to fish, waterfowl, pets or humans when used according to label directions. Many products and formulations containing methoprene (Altosid®) and Bti (Bactimos®, Vectobac®) are used by mosquito abatement agencies and other professionals. Homeowners can purchase the methoprene-based larvicide, PreStrike™ in hardware stores. PreStrike is formulated as a granule and comes in a shaker bottle. Various products containing the mosquito- specific bacterium, Bti, are also sold to homeowners. Mosquito Dunks® and Quick Kill® Mosquito Granules, for example, can be found at hardware and discount stores.

Adult Control - Adult mosquitoes prefer to rest in moist, shady areas such as dense vegetation during the daytime. Consequently, homeowners should remove tall weeds and overgrown vegetation from their yards. To further reduce intolerable levels of biting adult mosquitoes, residual insecticides can be applied to shrubs, hedges and other shaded areas, such as under decks and along foundations. Research by University of Kentucky entomologists indicates that such treatments effectively suppress nuisance, biting mosquitoes for about a month. Residual mosquito sprays are often best applied by professional pest control firms. Homeowners opting to try this themselves should use lawn and garden insecticides containing permethrin (e.g., Ortho Mosquito B Gone, Spectracide Mosquito Stop), cyfluthrin (Bayer Advanced Powerforce Mosquito Killer), bifenthrin (e.g., Ortho Home Defense Max), or lambda cyhalothrin (Spectracide Triazicide). For homeowners, a hose-end sprayer is usually most effective for making such applications.

Exclusion - Mosquitoes can be kept out of homes by securely screening windows, doors and porches. The occasional mosquito found indoors can be eliminated with a fly swatter. Aerosol-type insecticides labeled for mosquitoes, gnats, and other flying insects seldom provide much relief at the dosages applied by householders.

Topically-Applied Repellents - Repellents will help prevent bites when spending time outdoors. Traditionally, the most effective mosquito repellents contained the active ingredient diethyl toluamide (DEET) ranging from 5% to 40%. Higher percentages of DEET in the ingredients provide longer protection. Low -percentage formulations (10% or less) are suitable for shorter periods outdoors (e.g., a few hours), and are recommended for use with young children. Recently, two additional mosquito repellent

ingredients were registered by the U.S. Environmental Protection Agency and recommended as alternatives to DEET by the Centers for Disease Control and Prevention. Picaridin (*7% Cutter Advanced*) and Lemon eucalyptus oil (*30% Repel Lemon Eucalyptus*) provide relief for about 2 to 4 hrs, particularly when insect biting activity is not too severe. Unlike DEET-based repellents, Picaridin is essentially odorless and Lemon eucalyptus oil has a lemon scent. For many people, the new products will also have a more pleasing feel on the skin. With a little hunting, both repellents can be found on store shelves. Always read and follow directions on the container.

Other Control Possibilities - Many consumer products claim to attract, repel, capture or kill mosquitoes. Most of these devices do not appreciably reduce mosquito abundance or incidence of bites, or else their claims are unproven. Electrocuting devices or "bug zappers" using ultraviolet light as an attractant are generally ineffective in reducing outdoor populations of mosquitoes and their biting activity. Studies indicate that mosquitoes make up only a tiny percentage of the insects captured in such traps. The majority are moths, beetles and other harmless night flying insects. Other types of mosquito traps utilize carbon dioxide, warmth, light, and various chemicals (e.g. octenol) as attractants and claim to capture tremendous numbers of adult mosquitoes. Such devices can be quite expensive. Performance claims to the contrary, such traps seldom have been shown to reduce populations of biting mosquitoes on one's property, or the frequency of bites. In some situations, they could even attract more mosquitoes into the area they were meant to protect.

Advertisements for portable electronic devices using high frequency, ultrasonic sound routinely appear in magazines, claiming to keep mosquitoes and other pests at bay. Some supposedly repel mosquitoes by mimicking the wing beat frequency of a hungry dragonfly. Scientific studies have repeatedly shown these devices to be of negligible benefit in deterring mosquitoes and reducing bites. Save your money, as these devices seldom if ever provide any appreciable measure of protection.

Citronella oil does have mosquito-repelling properties and the scented candles can provide some protection. For maximum effect, use multiple candles placed close (within a few feet) of where people are sitting. A single candle located at the center or edge of a picnic blanket probably will not provide much benefit other than atmosphere. Mosquito-repellent plants, garlic, and other oft-advertised botanical products generally are ineffective.

Bats and certain types of birds (e.g. purple martins) are often cited as effective natural agents for managing outdoor mosquitoes. Conservation groups and nature magazines often suggest building bat and birdhouses on one's property to promote nesting and to protect against mosquitoes. Although insectivorous bats and birds do eat mosquitoes, they make up only a very small portion of their natural diet. Much like the mechanical "bug zappers," bats and birds capture all manner of other flying insects also. Efforts to colonize and conserve these animals should not be done with the primary intent of diminishing biting mosquitoes.

When it comes to managing mosquitoes, a good rule of thumb is if the approach or device sounds too good to be true — it probably is.

Few Management Alternatives for Insects around Swimming Pools
By Lee Townsend

Swimming pools attract a variety of insects. Honey bees come to collect water for use in their colonies. A few aquatic insects, mostly bugs and beetles, come because water is their natural environment; to them, a swimming pool is just another pond. A few (like thrips) come as a result of disturbances – cutting hay fields or wheat. Finally, there are those that just accidentally fall into the water and cannot escape.

Honey bees need lots of water to maintain optimum hive temperature and humidity; a nearby swimming pool may be the most convenient supply, causing alarm to pool owners and users. Worker bees that find a good water source will recruit colony mates to join them. Over time, hundreds of bees may be appear. Some will fall into the water and drown but

others will keep coming. They are preoccupied with this task and generally are not a threat. Dealing with bee visits to small kiddy pools can be as simple as moving the pool to a different spot in the yard every few days. Bees follow directions very strictly and if the pool is not where it should be, they will not find it easily. You can stay ahead of them with the moves.

Aquatic insects, such as backswimmer bugs and toe biters, may arrive in large numbers as they fly from ponds in which they developed to colonize other bodies of standing water. In some cases, they may be abundant enough to clog filtering systems. Usually, this mass movement lasts only a few days. Backswimmers are predators; they can give a painful bite with their piercing-sucking mouthparts. There should be no question as to what the toe biter can do. The pain from these bites is similar to a bee sting but there is no toxin.

Figure 9. Backswimmer with oar-like hind legs.

Figure 10. Giant water bug - toe biter.

Thrips can make a dramatic appearance. These tiny elongate yellow insects were described on one insect ID form as follows: "These little biting things covered an aboveground pool and deck. They were so thick that you could wipe them off with your hand. They have painful bites, children could not play in the pool for them."

Thrips show up at pools probably drawn to water or driven there from nearby recently-cut hay fields. On normal days thrips use their abrasive mouthparts to rasp at plant tissue, especially flowers. However, they will scrape skin, perhaps as they attempt to pick up small amounts of moisture. An occasional thrips scrape probably is tolerable but lots of them do not add to the swimming experience. A strong jet of water may be used to plaster them to decks and other surfaces where they have accumulated.

Finding and managing the source of an insect problem usually is the most effective management practice but this is rarely possible or practical with swimming pool invaders. There is no safe or effective means of treating pool water to keep intentional or accidental invaders away. Covering the pool when it is not in use may be the best and only way to exclude chronic problems with unwanted creatures. Fortunately, this may be needed for only a few days at a time. The clumsy pool invaders are the easiest to handle – the few that fall in can be removed with a cleaning net or cup.

DIAGNOSTIC LAB HIGHLIGHTS

By Julie Beale and Paul Bachi

Recent agronomic samples in the PDDL have included gray leaf spot on corn; boron deficiency and leaf hopper burn on alfalfa; glume blotch on wheat; brown stripe on orchardgrass; Rhizoctonia stem/root rot on soybean; black shank, Pythium root rot, target spot, phosphorus and potassium deficiencies, manganese toxicity, transplant shock, frenching, wireworm injury, and tomato spotted wilt virus on tobacco.

On fruit and vegetable samples, we have diagnosed anthracnose, black rot, downy mildew and Pierce's disease on grape; thread blight, scab and frogeye leaf spot on apple; black knot on plum; scab on peach; common [bacterial] blight, Rhizoctonia root/stem rot and Pythium root rot on bean; bacterial wilt on cantaloupe; Fusarium root/stem rot on squash; bacterial spot and Pythium root rot on pepper; bacterial spot, Pythium root rot, Septoria leaf spot, buckeye rot, blossom end rot, catfacing and walnut wilt on tomato.

On ornamentals and turf, we have seen bacterial spot on chrysanthemum; Septoria leaf spot on sunflower; bacterial spot on pothos; Pythium root

rot on vinca; Phomopsis canker on rose; thread blight on cherry and filbert; Botryosphaeria canker on dogwood and elm; scab on crabapple; anthracnose on oak; Phyllosticta leaf spot on lilac; white pine root decline on pine; anthracnose and Pythium blight on bentgrass; brown patch and dollar spot on fescue; necrotic ringspot on bluegrass.

INSECT TRAP COUNT
JUNE 26 – JULY 3

Location	Princeton, KY	Lexington, KY
Black cutworm	9	63
Armyworm	21	406
Corn earworm	120	3
European corn borer	0	0
Southwestern corn borer	1	0
Fall armyworm	0	0

Graphs of insect trap counts for the 2009 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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