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KENTUCKY PEST NEWS

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HOUSEHOLD

Pest Problems Following Rains and Floods
By Lee Townsend

Several insects (and slugs) will thrive after prolonged rains and floods. Some will appear soon after things begin to dry out, others will show up later. Expect an increase in accidental invaders, spiders, millipedes, centipedes, and sowbugs or pillbugs that enter structures in response to high water or increase their activity because of humidity and dampness. Also, there are midges, gnats, mosquitoes, and springtails. These require moisture or high humidity and can multiply rapidly following rains. Then, there are many small beetles and a mite, that are associated with molds and fungi that increase under wet conditions. Unfortunately, some may survive in protected spaces, such as wall voids and damp crawlspaces. Finally, some, like the foreign grain beetle may not be noticed for a couple of years, until newly dry-walled areas cure.

Fortunately, many are temporary nuisances that will disappear with drier conditions. Swatting, wiping, and collecting them with a shop vac can be effective. Avoid the temptation to over-apply insecticides to solve these problems
Midges and gnats are common names for a large number of small, non-biting flies. Many species look like mosquitoes and may form annoying swarms or clouds in the air but they do not bite and usually only live for a few days. Large mating swarms of adults often appear about dusk and may occur for several days, especially after a prolonged wet period. Many gnats are attracted to light and may be a nuisance, landing on people or entering homes or businesses. These tiny flies do not feed. The immature stages develop in water in pools, containers, ponds, and clogged rain gutters, along with mosquitoes. Some develop in wet soil and accumulations of leaves and other matter. Most of the gnats feed on decaying plant matter, some live in very stagnant or polluted water. The adults only live long enough to mate, lay eggs, and die. Eggs are laid in masses in the water or on aquatic vegetation. The life cycle usually takes about 4 to 5

weeks. There may be several generations during the summer but these insects usually disappear with the onset of dry weather. Fortunately, problems are usually temporary and intermittent.

There are no good alternatives for control of the adults, other than some pressurized aerosol sprays containing pyrethrins. These are impractical for treating anything other than small areas. These products only kill insects that are directly hit by spray particles, there is no lasting or residual effect. More gnats will quickly enter the area after the spray has settled.

Long term control requires trying to eliminate breeding sites, wet areas or standing water. Often, however, this is not practical. Water should not be treated with any insecticide in an attempt to control gnats. The potential harm to the environment and wildlife is too great to justify an application for a temporary nuisance.

Figure 1. Springtail

Already there have been some problems with springtails, small, wingless insects that are very abundant in moist leaf litter or soils with high levels of organic matter. They can hop around like tiny fleas. Springtails typically feed on decaying plant material or fungi that grow in humid areas. They can enter homes from around the foundation or openings to crawlspaces. In some cases, springtails can live for some time in damp areas of houses and buildings that meet their moisture needs. These insects also can live in pots containing over-watered houseplants. Allowing the soil to dry out will usually eliminate them. Occasionally, they can infest greenhouses where they may nibble on plant root hairs or tender leaves.

Springtails are not harmful but their presence in an area indicates moist conditions that may come from things such as water leaks or condensation from sweaty pipes. Correcting these problems will end the infestation and the potential for more serious water or mold damage in a structure. Using a fan or dehumidifier to increase ventilation and to provide a drying effect in the home can be very effective as can repair of plumbing leaks and dripping pipes. These actions will eliminate the moisture that springtails need for food and survival. Aerosol insecticides that are labeled for indoor insect control can be used to reduce springtails temporarily but this does not correct the moisture or humidity problems that allow the insects to thrive.

Outside the home, remove excessive mulch and moist leaves, prune shrubbery and ground cover, and eliminate low, moist areas around the house foundation to permit proper air circulation. Remove wet, moldy wood or other moldy items.

Bugs of Summer
By Lee Townsend

Figure 2. Eyed Click Beetle

A number of unusual creatures – either by shape, markings, or behavior show up during the summer. One that has put in an appearance is the eyed click beetle, easy to recognize because of the eye-like markings on the prothorax. These "eyes" may serve to cause potential predators to reconsider their meal selection before grabbing this 1.5 inch-long insect. The cylindrical yellow/brown larva lives in rotting wood and is a predator. The family Elateridae (click beetles) have a stout spine on the underside of the body behind the head that lets them toss themselves into the air if they are put on their back. Still great fun for a summer day.

SHADE TREES & ORNAMENTALS

Leaf Spots Can Damage English Ivy
By John Hartman

Frequent rain events in Kentucky this spring have promoted leaf spot diseases in many English ivy beds. In the landscape, there are two important English Ivy (*Hedera*) leaf spot diseases, one caused by a fungus and the other caused by a bacterium. The two diseases are sometimes difficult to tell apart, however, the bacterial leaf spot tends to occur more frequently in summer.

Fungal leaf spot (anthracnose) appears as large, irregularly shaped tan or brown spots (Figure 3). Within the dead spots numerous slightly raised dark blister-like fungal fruiting structures may be observed when examined with a hand lens. The dead areas may be surrounded by a yellow "halo." The causal fungus is *Glomerella cingulata*, however, the imperfect fungal state, *Colletotrichum trichellum* is normally seen now. Close examination with a hand lens may show spine-like formations associated with the fungal fruiting structures though they are not always present. There are other fungal leaf spot diseases of English Ivy which also produce fungal fruiting structures; this distinguishes them from bacterial spot, which produces none.

Figure 3. Anthracnose of English Ivy.

Growers should avoid planting diseased plant material, and avoid sprinkler irrigation which splashes fungal spores from diseased to healthy plants. To prevent fungal leaf spot disease, treatments with fungicides containing fixed copper, thiophanate-methyl [Cleary's 3336], or mancozeb [Fore] can be tried. These fungicides will not "cure" already infected leaves.

Figure 4. Bacterial leaf spot of English Ivy.

Bacterial leaf spot (Figure 4) is favored by periods of warm, wet weather typical of summer in Kentucky. This disease, caused by the bacterium *Xanthomonas hortorum* (*campestris*) pv. *hederae*, can be especially damaging to Ivy growing in many landscapes. The bacteria invade leaves, shoots, and stems through stomata and wounds causing a greenish-brown angular leaf spot 1/4 to 1/2 inch or larger in size. The spots sometimes appear greasy and may have a yellow margin; as they age, spots turn dark brown and may crack as they dry. Rainstorms and overhead irrigation help spread the disease in the landscape by splashing bacteria from diseased to healthy plants.

Bacterial leaf spot disease is diagnosed in the laboratory by observing bacterial streaming under the microscope, however, the disease is often so active that county agents or landscape industry specialists can also diagnose the disease in the field in the same way. Cut through several leaf spots with a sharp knife and place small infected leaf pieces on a glass slide. Add a drop or two of clean water to the infected tissue and cover with a small glass cover slip. After a few minutes to an hour, bacterial streaming can be seen just by holding the glass slide up to the light and observing the milky color of the water near the dissected leaf spot. Fungal spots do not produce bacterial streaming as described above.

Purchase and install only disease-free plants and avoid sprinkler irrigation. Treatment with copper-based fungicides is helpful in slowing the spread of bacterial leaf spot.

Emerald Ash Borer Status
By Lee Townsend

Figure 5. Emerald Ash Borer

The most current information on EAB findings for Kentucky can be found at http://pest.ca.uky.edu/EXT/EAB/welcome.html. Positive findings represent counties in which EAB activity and adults or larvae have been found at a site; these are Franklin, Jefferson, Jessamine, and Shelby. However, it does not mean that the insect is active in the entire county. The possible findings list includes counties where trees exhibit D-shaped exit holes but no adult or larval specimens have been found. Kenton County is the only one in this category.

An excellent presentation of information on control options for the EAB is available on line at http://pest.ca.uky.edu/EXT/EAB/EABcontrol.pdf "Insecticide Options for Protection Ash Trees from Emerald Ash Borer.

TOBACCO

Disease Update
By Kenny Seebold

The status for blue mold as of June 1, 2009 remains unchanged from last week. No blue mold is believed to be active in the United States. The target spot epidemic that hit tobacco transplants several weeks ago has subsided; however, we are seeing increased amounts of Pythium root rot and bacterial soft rot (black leg) on float plants. Hopefully we'll have good weather in the coming days so that plants can be taken off the water and put in the ground!

For recommendations on the control of tobacco diseases, please consult past issues of the Kentucky Pest News, or the Kentucky-Tennessee Tobacco Production Guide (ID-160), available at http://www.ca.uky.edu/agc/pubs/id/id160/id160.pdf . For up-to-date reports on the status of blue mold and other tobacco disease information, check the KY Blue Mold Warning System online at www.uky.edu/Agriculture/kpn/kyblue/kyblue.htm.

WHEAT

Bin Preparation is the Most Important Aspect of Good Wheat Storage
By Doug Johnson

In just a few weeks a major portion of our 2008-09 wheat crop will go into storage of some type. In fact, if this message is prompting you to prepare your bins, you are probably behind the curve. However, there is perhaps no more important pest control strategy in successful storage of wheat than bin preparation. Certainly there is no less dangerous and expensive alternative.

I cannot say enough about the importance of clean, dry grain. In Kentucky we find that the most common stored grain insects are not the weevils and grain borers, but rather flour beetles (Red & Confused), and the Flat & Rusty grain beetles. Though these insects may be less dangerous than the weevils and grain borers, they are more numerous and thus more likely to be detected. Storing wheat at 12 - 12 ½ % moisture at temperatures less than 50^{o}F are the closest thing to complete prevention that we can obtain. These conditions are not always possible to obtain, but they should be our goals.

Bin preparation should occur at least two weeks ahead of binning. All old grain and leftover grain and associated dust and trash should be removed from the bin site. This includes inside the bins and associated ducts, around the outside of the bins, including pits, conveyers and legs. Beyond grain moisture and temperature, thorough sanitation is the single most important control practice.

Everything through which your newly harvested grain passes may provide insect contamination. This includes combines, wagons, trucks and all machinery used to move grain through your system. All of these items should be thoroughly cleaned to remove old grain, grain dust and trash. Neglecting to do this will result in your "seeding" your grain stream with insect pests.

Insure that your storage provides sound protection from the outside. Patch, caulk or otherwise cover places in the bin walls, joints and roof that will allow the entrance of water and insects. A ¼" hole might seem small to you, but it is a mega-tunnel to insects crawling up the outside bin wall.
Once your bins are clean and in good repair, consider the following chemical treatments. Fumigation under perforated floors and in duct systems can be extremely helpful. Many, perhaps most, storage insect infestations start with insects hiding in these out-of- the-way places. While a good tool, fumigation is quite dangerous. If possible all fumigations should be completed by trained professionals. Considerable specialized equipment is required to perform a safe and effective fumigation. If your fumigation is not done properly, it will not reach the areas of need and you will have accomplished nothing, all at a relatively large expense.

Consider treating the insides of your bins with an insecticide labeled for such use. This will supply some added protection in the short run. But do not expect the insecticide to hang around on metal or a concrete wall during our hot summertime. We are simply trying to keep the beginning population to as small a number as possible.

Some storage managers will treat the grain with a grain protectant. Although this is more likely in wheat than in corn (there are no protectants for soybean), with good management this is probably not needed. Additionally, these products are quite expensive. If you decide to use a grain applied protectant and you use a grain drier, remember to apply the product AFTER the grain has cooled. Applying the protectant to hot grain will just cause it to deteriorate more quickly.

Move air through the grain any time you can. Reducing the grain temperature has a direct affect on the growth of insect populations. This is in fact why we have more troubles in wheat than in corn. Even in a hot Kentucky summer, there are times when outside air is cooler than the grain mass. I strongly recommend the use of automatic fan controllers. Information on these devices can be found on the UK BioSystems and Agricultural Engineering web site at:
http://www.bae.uky.edu/ext/Grain_Storage/default.htm
-OR- from Dr. Sam McNeill of that department.

In Kentucky we sometimes have problems with moth pests in addition to the beetles. The caterpillar (young stage) of these pests is the important stage. If this is a common problem you can prevent the situation using a "Cap out" treatment. Applying a layer of one of several products containing *Bacillus thuringensis* (B.t.) to the top four inches of the grain will provide a barrier.

Regular checking of your stored grain for insect and storage problems can be of great value. For grain spoilage and for surface infesting caterpillars (for example, Indian meal moth) simply looking in the hatch and using your nose to smell the grain can be of major value. Additionally, pheromone baited traps can be used to capture the moth (adult) stage of the caterpillar pests to provide advanced warning. Pitfall traps are a relatively simple way to detect the presence of stored grain beetles within the grain mass. This takes a little practice, but will be increasingly more useful as one gains experience with them. Though we do not have definitive thresholds for these measures, they will tell you when the insects are present and, by taking samples through time, how the population is changing.

After one has used these techniques for several years, they may also provide a measure of increasing or decreasing risk of insect damage. Without question the worst time to detect an insect infestation is when the grain is being unloaded for delivery. This is acutely true if the wheat is being delivered in late winter or early spring before the temperatures warm up above 40^{o} F. At this time there is little or nothing that can be done to remediate the situation. It is still too cold for fumigation or insecticide application. Even if it is later in the year when fumigation or insecticide application can be done, there will be several days to a week delay in delivery. Add this to the fact that a detectable infestation at this time indicates these pests have been active for a long time period, probably months.

For fumigants and insecticides that may be used in stored wheat, please see
ENT-47, Insecticides Recommendations for Small Grains-2009 available at:
http://pest.ca.uky.edu/EXT/Recs/ENT47-SmallGrain.pdf
-OR- from your County Cooperative Extension Office.
"If you can only do one thing, store clean dry grain in clean dry bins!"

Wheat Fusarium Head Blight (FHB) Widespread in Kentucky
By Don Hershman

The title of this article will not take many in Kentucky by surprise. FHB, also called head scab (Figure 6), has been on the front burner in wheat production circles for the past month. Presently, there are a large number of fields with 30-70% disease incidence; some have less disease and some have more. Many fields were

Figure 6. Typical symptoms of Fusarium head blight (head scab) in wheat.

treated with a fungicide in a timely fashion, and this has certainly helped keep disease levels down (by 30-50%). However, many applications were made late and/or under less than ideal conditions. As a result, FHB control is not very good in some treated fields. In addition, many fields were planted last fall to varieties that have reduced susceptibility to FHB; this has really helped. However, the overriding factor which seems to have played the greatest role in determing FHB level is when the field flowered relative to wet periods. The period just before to just after flowering is the time when wheat is the most fusceptible to infection by the FHB fungi (primarily, *Fusarium graminearum*). Generally, fields that flowered during the last week in April though the first 10 days in May seem to have the most FHB. Unfortunately, a large percentage of the Kentucky wheat crop flowered during this period.

If you recall, there was great concern last year that we would have a lot of FHB, but it never happened. In fact, 2008 was one of the lowest FHB years on record. When I checked through weather records for Princeton, Caldwell County, KY for the period April 26 – May 28, 2008 vs 2009 (the critical period for FHB infection and development), there was not a great deal of difference in the number of wet days and total rainfall (6.82 inches of rain and 14 wet days in 2008 vs. 7.67 in rain and 18 wet days in 2009). However, there was a significant difference in average temperature and timing and arrangement of wet days between the two years. In 2008, the average temperature for this period was 4°F ***lower*** than in 2009. Also, in 2008, most rain events were followed by warm, sunny, windy days which tended to dry the crop out between rain events. Both situations apparently kept the FHB risk down. In addition, most wheat fields in 2008 flowered when conditions were, more or less, dry and sunny. This year, there was a block of seven straight days of precipitation, with a one day break, followed by another four days of rain from April 28 – May 9. This block of nearly 11 consecutive wet days concided with the onset of flowering in most wheat fields. It is no wonder we have a great deal of FHB this year compared to last.

The potential for an FHB "situation" was indicated by the FHB Risk Assessment Tool (www.wheatscab.psu.edu/), but it did not provide producers with much advanced warning. As of May 2, the FHB Risk Assessment Tool map (Figure 7) was showing low risk for most of the state, with a few small spots of moderate risk. At that time, wheat in the far southwestern part of the state was in early flowering, but most wheat in the state (including Princeton) was in various stages of head emergence or extremely early flowering (<1% of main tillers with anthers).

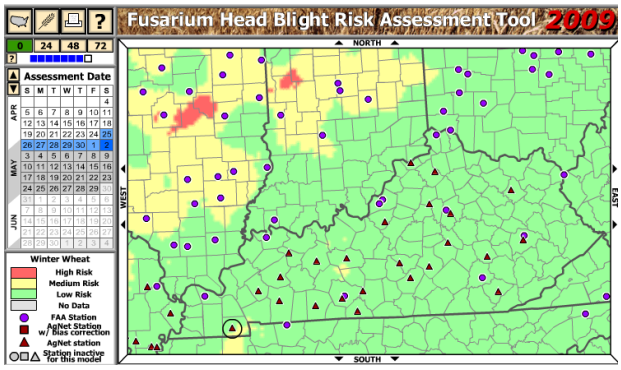

Figure 7. FHB risk as of May 2, 2009.

Two days later, on May 4, there was a significant shift towards an increased FHB risk (Figure 8).

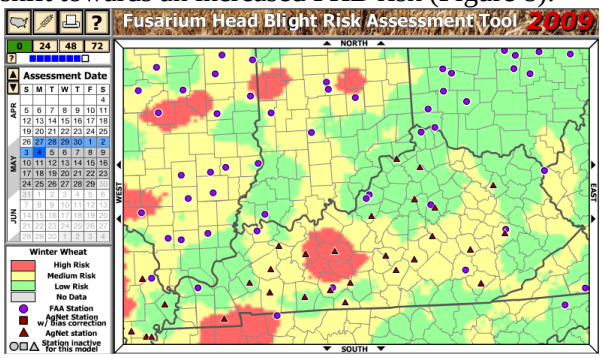

Figure 8. FHB risk as of May 4, 2009.

By May 6, conditions deterioriated even further, and a moderate to high FHB risk existed across much the state (Figure 9).

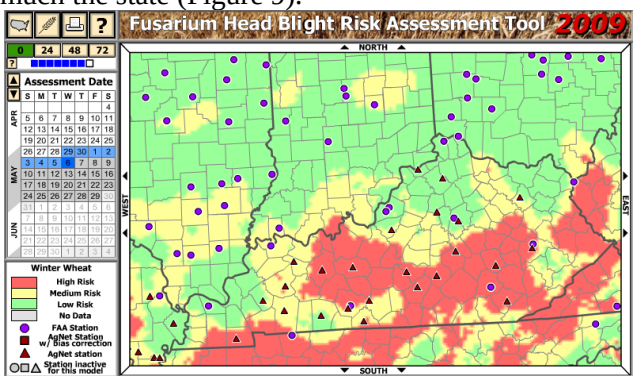

Figure 9. FHB risk as of May 6, 2009.

So, the FHB Risk Assessment tool was accurate, but it was not very helpful because by the time the disease prediction models finally "kicked in" and showed an elevated FHB risk, fields were beginning to flower and were at peak susceptibility to infection. At the same time, wet weather greatly hindered attempts to get fields sprayed with a fungicide. As a result, many fields either did not get sprayed, or applications were compromised in some way. Fortunately, many growers were able to do a good job with applying fungides.

As of this writing, the extent of FHB damage in KY is still not known. Some fields are infected, but are still in the process of expressing symptoms. As a general rule of thumb, maximum symptom expression usually occurs 21 days after infection or the soft dough stage, whichever comes first. Once a field begins to dry down, it is nearly impossible to see FHB symptoms. However, if you take a few hand-fulls of heads from several locations in a field, crush the heads in your hands, and blow the chaff away, you will see the telltale evidence of FHB: scabby grain (Figure 10).

Figure 10. Scabby grain (left) vs. healthy plump grain (right).

Scabby kernels are shriveled and frequently have a faint pink or salmon discoloration.
Grain severely impacted by FHB will be shriveled and will have a low test weight. Grain will also be contaminated with a mycotoxin called deoxynivalenol (DON). Grain with a low test weight and excessive DON can greatly limit the marketability and end-use of grain (feed and food). If the FHB problem extends beyond KY and becomes a regional concern (i.e., regional soft red winter wheat crop), grain prices received throughout the region may be negatively impacted as the market employs a "regional discount" in order to make up for increased costs (storage, blending, etc). If FHB turns out to be a mostly Kentucky problem, elevators will apply discounts to grain lots that are substandard. Seed producers should be aware that germination and vigor are also seriously reduced in scabby grain. For non-seed producers, seed shortages of certain varieties and reduced seed quality are often common following a major FHB episode.

At this point there is no way to alter the course of FHB in a field; however, there are several steps producers can take to minimize the impact of FHB. These include, but are not limited to, early harvest, turning up the combine fan during harvest to expel lightweight seed out the back of the combine, storing grain with high scab content separate from healthy grain, storing affected grain at slightly lower moisture content. Look for much more information to become available in the coming weeks and months to help you minimize the impact of FHB this year, and reduce the potential for FHB to occur in subsequent years.

CORN

Insect Damage to Corn Seedlings
By Ric Bessin

There are a number of causes for damage to young corn seedlings including diseases, weather and storm related causes, herbicides, even rodents and larger mammals. When diagnosing damage in the field it is important to keep an open mind to all potential causes and to look carefully for symptoms not only on and around individual plants, but also to look for patterns of damage down the row and throughout the field. This article will help to categorize the type of insect damage that is common early in the season on young seedlings.

Wilting of the newest leave(s) emerging from the center of the seedling: There are several potential insect pests that can cause this type of damage. This is called a deadheart and the seedling may begin to produce one or more secondary tillers from the soil line. It is necessary to dig up the plant to examine the crown of the plant. Wireworms can attack the young seedlings and will chew a small ragged hole from the side of the crown to the growing point. The leaves in the center wilt as they

become detached at their base. Often there is a wireworm in the soil near the base of the plant. White grubs can also cause this type of damage when they chew into the side of the base of the plant. Unlike wireworm damage, this is not a small hole, but is a large feeding wound where a third or more the side of the crown is removed. The white grub is usually found in the soil near the plant. Common stalk borer can also tunnel in the center of the seedling at or above the growing point. An entrance hole may not always be present at the base of the plant so it may be necessary to split the stem to look for the larva. When corn is planted late under drought conditions, lesser corn stalk borer may be the cause. This insect builds a silken tube that contains bits of soil and debris in the soil that is attached to the base of the plant. Like wireworms, the lesser cornstalk borer chews a small hole into the base of the plant.

Seedlings stunted with leaves yellowing or purpling: This is can be an indication of insect damage to the roots. It is always necessary to dig the plants with a shovel and look carefully at the roots and soil surrounding the roots. Medium to large white grubs feeding on the roots can cause this and are often found in the soil near the base of the plant. A single white grub can cut through several of the primary roots. Another potential insect pest that can cause this type of damage is the grape colapsis grub. While similar to white grubs in shape, they are much smaller than white grubs, only a few millimeters in size. Corn root aphid can also be the cause with only a few aphids needed to cause the stunting and discoloration. The corn root aphid is greenish blue with a light waxy appearance. They are in association with ants and evidence of ant colonies are often seen near the damaged plants.

Leaves twisted, deformed, stunted, or appearing dissolved: There are often several holes (two to four) with diffuse margins in a transverse pattern on one or more of the leaves. These holes are irregular in shape and usually have discolored margins, as if the tissue has been dissolved. The damage is due to stink bugs feeding at the base of the plant and injecting enzymes in the plant. Stink bug damage can take many forms, feeding near the base can injure the growing point and cause tillering. Often the leaves harden and do not emerge and expand properly resulting in compact stunted plants or even buggy whipping of the leaves as they do not completely emerge from the whorl. Yellowing of the leaves may produce chimera-like discoloration. Often stink bugs will move down the row and attack several adjacent plants with varying levels of severity. Often the damage appears long after the stink bug has finished its feeding on the plant. Look for stink bugs feeding on the stem of the plant near the soil line to determine if they are still active. Damage may be more common along field margins.

Feeding damage to the leaves of the seedling: Holes in the leaves, along the leaf margins, or central leaves or stems that have been cut. Basal leaves with narrow feeding between the veins that mostly penetrates through the leaves can be due to slugs. This is common during cool, wet, cloudy weather and usually disappears with improvements in weather. Narrow feeding channels in the leaves between the main veins that does not penetrate through the leaves is an indication of corn flea beetle. Corn flea beetle is not limited to the lower leaves like slug damage. Feeding on the leaf margins and frass pellets in the whorl can be an indication of true armyworm damage. Small feeding holes in the leaves with cleanly cut margins or stems of the seedlings cut is often a sign of cutworm damage. When small, cutworms will climb the seedling and feed on the leaves, but as they grow they will begin to cut plants. Cutworms may cut the seedling at the soil line, just above, or even below. Look in and around the base of the corn plant for the cutworm larvae, they may hide in burrows under the soil during the day. One insect that can damage corn seedlings similar to cutworms is the southern corn leaf beetle. This tiny beetle is charcoal colored and difficult spot in the soil and debris around the base of the plant. The southern corn leaf beetle will cut through the upper one or two leaves pushing out of the developing whorl, this is usually higher on the plant than where cutworms attack.

VEGETABLES

Managing Bacterial Diseases of Tomato and Pepper

By Kenny Seebold

Unusually wet weather has been the norm this spring, and we're beginning to see a number of disease issues cropping up on our vegetable crops around the state. At the moment, the stage appears to be set for widespread problems with bacterial diseases on both peppers and tomatoes. Bacterial spot, which is caused by *Xanthomonas campestris* pv. *vesicatoria*, will affect peppers and tomatoes and tends to be the most common bacterial disease of these crops in Kentucky. We also tend to see quite a bit of bacterial canker, caused by *Clavibacter michiganensis* subsp. *michiganensis*, on tomato in rainy years and in fact have found at least one case in the past week.

Control of bacterial diseases of tomato and pepper can be difficult if nothing has been done before symptoms are observed. Prevention is the best defense! We recommend that growers use certified, disease-free seed or transplants; in the case of pepper, varieties resistant to the bacterial leaf spot pathogen are highly desirable. Managing bacterial diseases in the greenhouse goes a long way in keeping these problems out of the field.

Once in the field, good management practices can help reduce the threat posed by bacterial pathogens. Irrigate early in the morning to minimize the length of time that foliage is wet. Avoid working tomatoes and peppers when foliage is wet, as bacterial diseases and can easily be spread by handling or application of pesticides. Tomatoes and peppers should be rotated 2-3 years away to non-Solanaceous crops. Applications of fixed copper plus maneb (if it can be found) or mancozeb (depending upon the crop) are effective against bacterial spot when used as part of a preventive disease management program; however, these materials have little effect against bacterial canker of tomato. For those using bell pepper varieties with no resistance to bacterial leaf spot, or those who are growing non-bell types, a fungicide/bactericide program is absolutely necessary. Growers should be aware that 2009 could be a big year for bacterial diseases on peppers and tomatoes if rainy conditions continue. Refer to ID-36, the "Vegetable Production Guide for Commercial Growers" for more information.

PESTICIDE NEWS & VIEWS

Link between Certain Pesticides and Parkinson's Disease
By Paul Vincelli

A recent research paper in the *American Journal of Epidemiology*[1] reported findings of interest to the agricultural community. The authors studied pesticide exposure in the Central Valley of California and the incidence of Parkinson's disease, a progressive motor-system disease that causes tremors, impaired balance, and other symptoms. They focused on the fungicide maneb and the herbicide paraquat, because studies with laboratory mice have reported that exposure to a combination of these two pesticides can lead to a variety of neurological disorders. Maneb is the active ingredient in products such as Maneb (DF and WP formulations) and Manex. Paraquat is found in Gramoxone, Firestorm, and Parazone, as well as possibly other products. The authors estimated pesticide exposure using publically available pesticide use records required by law in California, records of where study subjects lived, and geographical information systems.

Some Key Findings
These authors reported that, in people living within three-tenths of a mile of fields treated with maneb and paraquat during the period of 1974-1989, the incidence of Parkinson's disease was more than doubled, as compared to people not so exposed. The risk was particularly high (more than four times higher than the non-exposed population) in people diagnosed with Parkinson's before age 60, suggesting that exposure at a young age was riskier.

The authors also point out that their analyses indicate that "…the critical window of exposure to toxicants may be years before the onset of motor symptoms which lead to [Parkinson's] diagnosis."

Significance
Maneb and paraquat are still used today and are considered important pesticides in some farming systems. Obviously this new study raises a cautionary note about the use of these materials.

[1] Costello et al., Volume 169, pages 919-926, 2009, DOI: 10.1093/aje/kwp006

However, this study linking Parkinson's disease to these two pesticides is not just about these two pesticides. It serves as a reminder to:

1. Minimize pesticide use where possible, by using all appropriate means to manage pests, diseases, and weeds (the IPM philosophy).
2. Minimize worker exposure when using pesticides. Use appropriate protective clothing, wash/shower after applying pesticides, and employ all the other safety practices recommended during pesticide applicator training.

DIAGNOSTIC LAB HIGHLIGHTS

By Julie Beale and Paul Bachi

Recent agronomic samples in the PDDL have included take-all and wheat streak mosaic on wheat; Sclerotinia collar rot, bacterial blackleg, Pythium root rot and weather-related scald on tobacco.

On fruit and vegetable samples, we have diagnosed anthracnose on grape; leaf curl on peach; cedar-apple rust on apple; holcus spot on sweet corn; Pythium root rot on pepper, bean, cucumber, squash and tomato; as well as bacterial canker and nitrogen deficiency on tomato.

On ornamentals, we have seen powdery mildew on pansy and honeysuckle; leaf gall (Exobasidium) on azalea; fire blight on hawthorn; spot anthacnose on dogwood; black spot on rose; anthacnose on ash and maple; and Phytophthora root rot on taxus.

INSECT TRAP COUNTS
May 22-29

By Patricia Lucas

Location	Princeton, KY	Lexington, KY
Black cutworm	19	3
Armyworm	21	347
Corn earworm	8	3
European corn borer	0	0
Southwestern corn borer	9	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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