UK COOPERATIVE EXTENSION SERVICE
University of Kentucky – College of Agriculture

LEXINGTON, KY 40546

KENTUCKY PEST NEWS

ENTOMOLOGY • PLANT PATHOLOGY • WEED SCIENCE
On line at: www.uky.edu/Agriculture/kpn/kpnhome.htm

Number 1148 **November 19, 2007**

CORN

Bt CORN AND INTERPRETING YIELD RESULTS IN 2008
by Ric Bessin and Chad Lee

Last week the Early Bird Decision meetings were held in Western Kentucky to assist growers with their grain seed purchases for 2008. There were a few questions regarding the superior yields with some of the Bt hybrids and stacks, particularly those with the RW genes. Results from some county strip trial demonstrations had indicated that these hybrids out yielded their 'isolines' without the Bt RW gene. This is not unusual at all, except that in these instances, there was no rootworm pressure in these fields. So why would we expect a yield bump when studying these comparisons?

One consideration that I have is how similar are these 'isolines' with and without Bt genes. It has been observed that in some instances the isolines can differ in other agronomic characteristics other than just insect resistance. For example, one county agent noted that two isolines differed in relative maturity by three days. This suggests to me that the isolines are differing in some of their background genetics apart from the presence or absence of the Bt RW traits. The breeding methods used to add a gene into a hybrid involves backcrossing an experimental line with the gene of interest into one or both of the inbred parents used to make a hybrid. The number of times it is backcrossed with the inbred parents will determine the degree to which it is genetically similar to the parent. For example, if 4 backcrosses are used to incorporate the gene into an inbred, then the modified inbred would be $(1-0.5^4)$ *100% or 93.75% similar to the original inbred. With six backcrosses that would become $(1-0.5^4)$ *100% or 98.44% similar. What that means is that there may be differences in the background genetics beside the Bt RW gene. The differences in yields observed in some of these trials might not be due to the presence or absence of the Bt triats, rather they may be due to other agronomic differences, even among isolines. Keep in mind that the individual traits will not necessarily make a hybrid yield better, the entire genetic package is critical to final yield potential and yield is still a dominate factor when selecting hybrids.

SHADE TREES & ORNAMENTALS

SPRUCE DISEASES AND DISORDERS ARE APPEARING IN THE LANDSCAPE
by John Hartman and Julie Beale

During recent weeks, significant numbers of samples representing diseased and declining spruce trees have been observed in the Plant Disease Diagnostic Laboratory. Symptoms have included yellowing, browning and shedding of current and especially last year's needles, twig and branch dieback, and death of limbs. There may be many different causes for the observed spruce problems, and many of the problems observed were made worse by or had a connection to drought.

Normal needle drop. Spruce and fir trees typically retain their needles for several years. In most years, needle drop is hardly noticeable without careful examination of the inner branches where a few scattered needles may turn yellow and drop in late spring or early summer of their third year. If spruce trees are not provided sufficient water during the dry part of the summer, needle drop could be earlier and more severe than normal. Normal needle drop is a seasonal occurrence and can vary from tree to tree and from year to year. Sometimes these old, yellow needles can harbor saprophytic fungi, but

these fungi are unlike the parasitic fungi that appear on younger needles.

Cytospora canker. Cytospora canker, caused by the fungus *Leucostoma kunzei* (imperfect stage, *Cytospora kunzei*), is commonly found on spruce trees growing in Kentucky landscapes, and is most noticeable on trees over 20 years old. Cankers may begin at the base of small twigs and develop into elliptic-shaped cankers. It is often noticed first on the lower branches with canker formation accompanied by white resin appearing on the infected branches or trunk. As the canker enlarges, the branch is girdled and killed. Needles on affected branches can appear purple at first and then turn brown as they die. Trees growing under stressful urban conditions, especially drought, are most vulnerable to Cytospora canker. Wounding, mechanical injury, construction damage, or insect injury can also contribute to Cytospora canker.

Drought and inadequate rooting space. Drought alone can cause spruce needle yellowing and loss followed by tree decline. Blue spruces are especially affected. Sometimes spruce trees are planted in the wrong place and as they get larger, have inadequate space for optimal root development. Inadequate rooting space in an urban environment, essentially confers drought conditions even when there is adequate rainfall.

Needle cast diseases. The fungus *Rhizosphaera kalkhoffii* causes a needle cast disease of spruce trees in Kentucky. Disease symptoms consist of yellowing first-year or older needles in summer which later turn brown and drop in fall, perhaps 15 months after initial infection. Thus, needles dropping in the fall of 2007 could be the result of infections that occurred in early summer, 2006 (a fairly wet season here in Kentucky). Diseased needles contain fungal signs in the form of dark spherical pycnidia which typically emerge from the needle stomata and are thus lined up in rows. These rows of pycnidia protruding through the stomata can be seen with the aid of a hand lens, and are fairly diagnostic for this disease. Affected branches eventually die if Rhizosphaera needle cast disease appears for several years in succession. Another needle cast, involving the fungus *Stigmina* sp. has also been observed here.

A new twig blight and needle cast disease. Sudden needle drop (SNEED) of spruce is a recently recognized disease of spruces that has not been confirmed in Kentucky, but may be appearing in nearby states. It can affect Colorado blue, Norway, and white spruces in both forest and landscape settings. Symptoms of the disease include 2nd year needles turning yellow, and then a purplish color, and progressive loss of these needles from the branches. Whole branches may develop a purplish cast. As the needles drop, the crown thins, and eventually, entire branches become bare except for the current-year's needles. Spruce needle drop is caused by a newly identified fungus, *Setomelanomma holmii*. This fungus can also be found on the twigs of infected trees. Spruce needle drop typically occurs throughout the tree as compared with Rhizosphaera needle drop which usually appears only in the lower part of the tree. It is thought that environmental stress (drought again) can trigger growth of the pathogen.

Spruce spider mite. Yellow, sickly needles can result from an infestation of spruce spider mites. Spider mites often build up in dry weather and the needles become off color, generally stippled, and gradually turn yellow. A light webbing is associated with heavy mite infestations. If mites are suspected, hold a white sheet of paper under a branch and sharply tap the branch. Look closely for small moving mites on the white paper. Seasonal needle drop can be confused with needle loss due to spider mite damage.

Improving the health of landscape spruce trees. Spruce health is enhanced by providing good growing conditions.

- Provide one inch of water per week during times of drought. Be sure the water is applied over the root zone and avoid getting the foliage wet.
- Mulch underneath the trees to retain moisture. Grass competes very well and can actually contribute to water stress on trees.
- Prune out diseased and dying branches (only under dry conditions) and take them away for burning or burial. Pruning tools should be sterilized with 70% alcohol between cuts.
- If needle cast disease has been diagnosed, a spring treatment with a chlorothalonil-based fungicide may provide protection. Timing of the treatment should coincide with needle emergence and be repeated as necessary until full needle emergence has occurred.
- Avoid unnecessary trunk or branch injuries.

HOUSEHOLD

FIREWOOD PESTS
by Mike Potter

This is the season when many homeowners begin to burn firewood. Firewood is a source of warmth and comfort, but can also be a way for pests to enter homes. Most pests living in firewood pose no harm to people, furniture, or to the structure. Nonetheless, homeowners often become concerned when insects emerge from wood that is brought indoors, and crawl or fly about the house.

Several types of pests dwell within firewood. Termites, wood boring beetles, and carpenter ants often tunnel and feed within the logs, but upon emergence, usually will not infest structural wood or furniture inside the home. Other kinds of pests hide or overwinter beneath the bark. Examples include centipedes, ground beetles, sowbugs, pillbugs, spiders, scorpions and wood cockroaches. Typically, these pests emerge within a few days or weeks of the wood being brought indoors. For the most part, they are harmless other than by their presence.

Preventing Firewood Pests

Control of firewood pests is best accomplished by management of the firewood itself. Spraying/dousing the wood with insecticides is not necessary, effective, nor recommended, and could produce harmful vapors when the wood is burned. A better plan is to:

1. *Store firewood outdoors, only bringing in what you plan to burn immediately or within a few hours.* Storing firewood for extended periods inside the home, garage or basement allows pests in the wood to emerge within the structure. Firewood stacked indoors can also become a harborage for rodents.

2. *Position the woodpile away from the house and off the ground.* Firewood stacked against the side of a building impedes ventilation and encourages moisture problems. Storing the wood in this manner also provides a direct, hidden avenue for termites and carpenter ants into the structure. Stacking firewood off the ground (e.g., on poles suspended between concrete blocks) increases air circulation and drying.

3. *Burn older wood first.* This shortens the time during which pest infestations can become established.

4. *Shake or knock logs together to dislodge any pests clinging to loose bark.* Don't forget to check bottoms of log carriers, since pests often crawl into these when the logs are transported into the home. The occasional insect emerging from firewood can easily be eliminated using a broom or a vacuum.

PESTICIDE LAWS

10 COMMON PESTICIDE INFRACTIONS – A REVIEW

Listed below are 10 common infractions of pesticide laws as found by inspectors in one EPA region. The list provides some good points for pesticide training classes because it serves as a reminder of some of the simple things that can be overlooked. The points are valid for both private and commercial applicators.

1. **Invalid business or applicator license** - Do you know where your card is? If so, check the expiration date. If not, well ...

2. **Label violation** - This includes the use of a product on plants (or sites) no longer supported by the label or not following label instructions. For example, the labels for many pesticides have been changed over the past 4 to 5 years as a result of the EPA's re-registration program. Consequently, many uses for products, such as diazinon and malathion, have been eliminated. Some applicators may continue to buy and use products on plants (sites) that are no longer on the label. Reading the label before purchase and use is imperative.

3. **Improper mixing** - Read compatibility statements and other directions carefully. Problems here can be due to prohibited tank mixes that cause interactions. There can be plant reactions from combinations of certain classes of pesticides that are applied days, or even weeks, apart.

4. **Failure to survey the site before applying a pesticide** - This can range from overlooking or forgetting a sinkhole in a field to accidental spraying of a pet's water bowl or children's toys by a lawn care applicator.

5. **Poor preparation for spills or other emergencies** - How many application rigs carry some soap, water, disposable towels, and an eyewash kit? Worker protection standards now are very specific about providing decontamination materials. Applicators should be familiar with how to handle spills of the pesticides they are transporting or applying.

6. **Drift complaints** - Particle and/or vapor drift can result in off-target movement of a pesticide. Knowledge of product characteristics and attention to environmental conditions such as wind speeds or inversions will reduce the potential for problems. Be aware of sensitive nearby crops or plants.

7. **Incomplete or missing records** - Private and commercial applicators must keep appropriate records of pesticide applications. Dealers who sell restricted use pesticides also must maintain records that contain specific information about products and purchasers.

8. **Spray tank not properly cleaned; applicator not familiar with tank's history** - This can lead to crop damage or illegal residues. Purchase of used spray equip-

ment should include determining the types of products that had been applied by the previous owner. Solvents in some EC formulations can serve as tank cleaners. This can result in inadvertent crop injury by the new owner.

Applicator makes erroneous product safety claims - While there could be cases of overselling a product, lack of familiarity with the label may be a major reason for unrealistic claims. Read beyond just the crop and rate information. Look critically for cautions or warnings, such as crop or variety sensitivity or effects of specific weather conditions on applications or product efficacy.

PESTICIDE SAFETY

PESTICIDE APPLICATOR SHOPPING LIST

Need last minute shopping ideas for the pesticide applicator on your list? Hand and eye protection are two very important considerations. People who handle and use pesticides can always use good protective equipment to reduce their potential for exposure.

Risk of pesticide exposure can be reduced by over 90% simply by using the appropriate gloves. Any residues of pesticides on the hands can be transferred easily to the mouth or eyes. From there, the chemicals can enter the body, possibly with harmful results.

Pesticide labels frequently specify use of either waterproof or chemical-resistant gloves. Rember, waterproof materials are not necessarily chemical-resistant. Select unlined gloves but never ones made of cotton, leather, or canvas. Investing in a pair of chemical-resistant gloves can go a long way toward preventing hand contamination.

Glove thickness is described in units of mils (1 mil = 1/1,000 inch). Thicker gloves are harder to tear and last longer. Avoid getting very thick gloves that make it hard to handle anything. Commercially available gloves range in thickness from 1 to 60 mils. The most commonly used chemical-resistant gloves range from 12 to 22.

Gloves are sized either numerically or qualitatively. A numerical scale ranges from men's sizes 7 to 12. The size designation refers to the circumference of the hand, in inches, measured around the palm and below the knuckles. Gloves sized qualitatively may carry labels such as "large," "men's size," or "one size fits all." Gloves are manufactured in a variety of lengths, measured from the tip of the middle finger to the edge of the cuff. Longer gloves that extend to the upper arm area are available.

Protecting the hands is very important but eye protection is valuable, too. Many of the solvents and other ingredients in pesticide formulations can burn sensitive eye tissue. Some products can cause permanent damage. There is a wide variety of eye protection available, ranging from safety glasses to totally protective goggles. Selection should be made according to the hazard and risk.

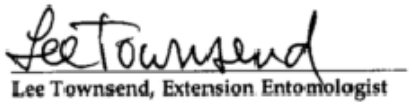
Prescription glasses and safety glasses no not give much protection when working with chemicals that can splash or spread like fumes do. Safety glasses with side shields are a little better but these usually do not meet label requirements for pesticide safety.

Goggles offer more protection than safety glasses. They are shielded all around the lens, preventing entry of particles from any angle. Adequate protection is provided if the right type of venting is selected

There are a few extra items that are very useful to have around during the field spray season. All are simple but few people have them where they need them in an emergency. A bottle or two of contact lens wetting solution makes an excellent eye wash to flush a pesticide splatter out of the eyes. A clean, disposable spray suit can be put on quickly if a pesticide is spilled on the clothing. And, a bag or two of cat litter is perfect for containing and cleaning up a liquid pesticide spill.

DIAGNOSTIC LAB-HIGHLIGHTS
by Julie Beale and Paul Bachi

November samples in the PDDL have included anthracnose on blackberry; rust on raspberry; anthracnose crown rot on strawberry; and Botrytis blight on greenhouse tomato. On ornamentals we have diagnosed black root rot on pansy; Phomopsis gall on forsythia; and bacterial scorch on oak. We have seen many samples of needle drop and twig dieback on spruce, which appears to be related mostly to adverse environmental conditions—see article on spruce decline in this issue of KPN.



Lee Townsend, Extension Entomologist

NOTE: Trade names are used to simplify the information presented in this newsletter. No endorsement by the Cooperative Extension Service is intended, nor is criticism implied of similar products that are not named.

COOPERATIVE
EXTENSION
SERVICE

UNIVERSITY OF KENTUCKY
College of Agriculture

Cooperative Extension Service

University of Kentucky
Entomology
S-225 Ag. Science Center North
Lexington KY 40546-0091