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 1150 **January 14, 2008**

ANNOUNCEMENTS

2008 IPM TRAINING – MARCH 5

The 2008 IPM Training School will be held on Wednesday, March 5, at the University of Kentucky Research and Education Center in Princeton. Registration will open at 8:30 AM with the meeting starting at 9:00 AM and ending at 3:00 PM.

Topics covered in the training will include: Soybean Rust Up-date, Corn Fungicides, Dectes Stem Borer, IPM Preventive Tools, Refinement of the UK Lime Recommendations and Herbicide Resistance.

The program is free of charge and lunch will be provided. **To guarantee a lunch, call (270) 365-7541 extension 216 or e-mail plucas@uky.edu before March 3.**

The program has applied for 5.0 CEU's for certified crop advisors and has also applied for hours for pesticide applicators.

TRAINING ON HOW TO USE INSECT TRAPS

Two trainings will be offered during the month of February on How to Use Insect Traps. The trainings will cover the different types of pheromone baited traps, how they work, trap placement, which trap to use for specific insect pests, using the data you collect and more.

Trainings are scheduled for February 13th at the Clark County Extension Office in Winchester and February 20th at the UK Research & Education Center in Princeton. Both meetings will start at 10:00AM (LOCAL TIME) and end at 2:00 PM.

The trainings are offered free of charge and lunch will be provided. **PLEASE PRE-REGISTER TO IF YOU PLAN TO ATTEND. SPACE AT EACH TRAINING IS LIMITED. To register to attend the trainings, call (270) 365-7541 extension 216 or e-mail makelley@uky.edu before February 8 and tell us if you will be attending the training at Princeton or Winchester!**

The program will apply for CEU's for certified crop advisors and hours for pesticide applicators.

CORN

FOLIAR FUNGICIDES ON CORN: SUMMARY OF RESEARCH RESULTS
by Paul Vincelli and Don Hershman

Interest in the use of foliar fungicides on corn throughout the U.S. has expanded dramatically in the past two years. Prior to 2006, less than 300,000 acres of corn were treated with fungicide. Estimates for the 2007 growing season are that a whopping 14 million acres (=10-12%) of U.S. corn crop were treated!

In an ongoing effort to address questions about the role of foliar fungicides on corn, university-based corn pathologists and agricultural professionals throughout the Corn Belt expanded their research efforts to evaluate the most important fungicides in field trials. This article gives a brief summary of the "state of the art" with respect to corn fungicides.

University Trials
A total of 89 replicated trials were conducted in 2007 in Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Minnesota, Missouri, Nebraska, North Dakota, Ohio, and Wisconsin, as well as in Ontario, Canada. Many of these

were conducted on commercial farms. Almost all trials were sprayed by ground rig; all were sprayed between VT and R1 stages, the optimal time period for fungicide application. For economic calculations, fungicide treatment was assumed to cost $20/acre and the market price of corn used in the analysis was $3.50/bu, resulting in a "break-even" yield difference of around 6 bu/acre. Dr. Carl Bradley of the University of Illinois conducted the combined analysis of these trials.

Overall, in trials conducted in 2007, foliar fungicides provided an average increase of 3 bu/acre over untreated corn; results in individual trials ranged from a 29 bu/acre yield loss to a 27 bu/acre yield increase in fungicide-treated corn. Out of the 168 different treatments evaluated , 63 (= 38% of the time) had a yield increase of at least 6 bu/acre. Thus, in these analyses, foliar fungicides did improve yield on average, but not enough to pay for the application in the majority of instances.

Looking at the performance of individual products, Headline applied at 6 fl oz/acre provided a yield increase exceeding the break-even point of 6 bu/acre in 39 out of 89 (=44%) trials. Quilt applied at 14 fl oz/acre exceeded the break-even point in 13 out of 37 (=35%) trials, whereas Stratego applied at 10 fl oz/acre exceeded the break-even point in 11 out of 42 (=26%) trials. These results suggest that Headline may provide a most consistent benefit of these fungicides, though future studies on this question are needed.

Not surprisingly, the benefit of fungicide application was greater in corn hybrids which were more susceptible to disease. In hybrids with good to excellent resistance to gray leaf spot, foliar fungicides produced an average yield increase of 3 bu/acre. In contrast, in hybrids with fair to poor resistance to gray leaf spot, foliar fungicides produced an average yield increase of 6 bu/acre.

Interestingly, corn-after-corn did not increase the yield gain obtained by foliar fungicide. In trials with corn following corn, the break-even point was exceeded in 28% of trials, whereas it was exceeded in 41% of trials where the previous crop was something other than corn.

Pioneer Analysis

Scientists from Pioneer conducted an analysis similar to that done by university scientists, using data from a total of 189 studies, including university tests from 2006 plus on-farm strip trials from 2006 and 2007. Their results were generally more favorable for the fungicides. For example, the Pioneer results reported an overall yield benefit of 8.7 bu/acre from fungicide application, with 60% of trials providing a yield boost exceeding the break-even value. (In the Pioneer analysis, a market value of $3.75/bu was assumed, as was a fungicide cost of $20.00/acre, resulting in a break-even value of 5.3 bu/acre.) Compare this—60% of trials exceeding the break-even point—with 38% for the university data for 2007. Certainly some of that difference is due to the higher market price assumed in the Pioneer analysis ($3.50/bu in the university analysis vs. $3.75/bu in the Pioneer analysis), but that doesn't account for the entire difference. The Pioneer analysis incorporated data for 2006 and 2007, whereas the university analysis only considered results obtained last year. It is possible that some of the difference is due to the fact that 2007 was a rather dry season in many areas, and that a stronger yield benefit will show up in university testing if we get a more normal weather pattern in 2008. This remains to be seen, but it is a possibility.

Another interesting aspect of the Pioneer analysis is that it compared the yield "boost" from a fungicide in trials with vs. without significant disease pressure. Where disease pressure was significant, the average yield boost from fungicide was 15.3 bu/acre. Where disease pressure was insignificant, the yield boost from fungicide was only 3.5 bu/acre, less than the break-even point. This is consistent with UK studies conducted in 2007 and previously, in which we found no significant yield increases in corn crops where disease pressure was insignificant. This is important because certain fungicides are being marketed both for disease control as well as for improving the overall health and physiology of the plant (Plant Health™ and Plant Performance™ trademarks). While products containing strobilurin fungicides (Headline, Quadris, Stratego, Quilt) provide excellent disease control, so far, there seems to be little third-party evidence that these fungicides improve the health of corn unless diseases are active.

Misc. Note

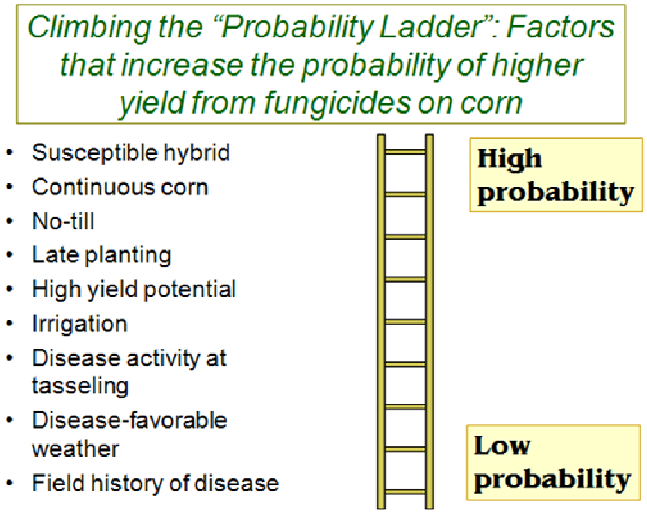
In a very low percentage of cases, pretassel applications of strobilurin fungicides on corn have been associated with damage to the ears, called "beer can ears", "blunt ear syndrome", or "hollow husk". You can see images of these symptoms at a web resource called *Abnormal Corn Ears,* produced by The Ohio State University (http://agcrops.osu.edu/corn/documents/AbnormalCornEarsPoster.pdf). This symptom forms when male flower parts form on the upper half of the ear instead of female parts. This is thought to occur only in a very low percentage of treated fields, but it does raise concerns about applying fungicides prior to tasseling.

Conclusions

As it stands now, the benefit of foliar fungicides in corn rests on their ability to control diseases. Therefore, growers should consider the risk of disease in their fields be-

fore deciding whether or not to treat. Figure 1 lists factors that are associated with increased risk of foliar diseases, particularly gray leaf spot and northern leaf blight. The most important factors are listed at the top. The more of these are in place by the time of tasseling, the greater the possible benefit of a fungicide spray.

Figure 1. Climbing the "Probability Ladder": Factors that increase the probability of an economic return from a fungicide application on corn



FRUIT CROPS

MANAGING BLUEBERRY STEM CANKER DISEASES
by John Hartman

During the 2007 growing season, weather extremes including the early April freeze and summer-long drought took their toll on blueberry crops in Kentucky. These environmental stresses created opportunities for several canker diseases develop. By season's end, canker diseases resulting in dead twigs and branches were appearing in many blueberry plantings. Continued winter freezing and thawing now could initiate further stem cankers and dieback. Growers will want to take action this winter to prevent spread of these canker diseases.

The main blueberry stem diseases we see in Kentucky include:

- Phomopsis canker and dieback caused by the fungus *Phomopsis vaccinii*,
- Botryosphaeria stem canker caused by the fungus *Botryosphaeria corticis* and,
- Fusicoccum canker caused by the fungus *Fusicoccum putrefaciens* (perfect stage is *Godronia cassandrae*). This disease is perhaps less common here than the other two.

Symptoms. Cankers on blueberry stems disrupt the flow of water and mineral elements to the distal parts of the twigs and branches. Most growers notice as first symptoms, the sudden wilting and death of leaves on infected twigs or stems. Leaves often turn a reddish color and remain attached to the stem.

- Phomopsis Canker and Dieback - Wilt and dieback of new shoots from the tips down is typical. In the first year, cankers can be found as brown areas between the ground and 3-4 feet high along the stem. Old cankers will appear flattened, grayish, and covered with tiny fungal fruiting bodies called pycnidia. In the heat of summer, sudden wilt and death of infected canes can occur, while healthy canes remain productive.
- Botryosphaeria Canker - Soon after fungal infection, small red spots can be observed along succulent stems. The canker grows slowly, but after six months the spots are swollen and conical. However, in some cultivars of blueberry the canker becomes brown and sunken. After several years the cankers are cracked and very visible, sometimes girdling the entire stem on susceptible varieties. Resistant blueberries will have cankers that are less visible and swollen.
- Fusicoccum Canker - In spring and summer, water-soaked lesions appear on one to two year old canes, from ground level to 3 feet high usually found near a leaf scar. The first year of infection, the lesions appear water soaked and later turn red by winter. The following spring the cankers enlarge (½ to 2 inches long) and become target like, turning reddish brown. With the onset of hot and dry weather, the leaves and twigs above the canker will wilt and die.

Disease Development. The canker-causing fungi overwinter as mycelium in diseased canes or as specialized fruiting structures called apothecia where they occur on dead stems. Generally, in the spring and summer ascospores or conidia are produced along the cankered area each time it rains. Conidia are spread via the wind or by rain-splash and can infect new growth on nearby plants as long as there is free water and temperatures are moderate. The canker diseases are most severe in seasons following winters with mild spells interspersed with cold weather. In addition, periods of hot, dry weather during the growing season may predispose plants to cankers. Infection is more likely to occur on plant canes that are wounded from mechanical injury or freezing than healthy, undamaged plants. Once the initial infection has taken place, the fungus slowly grows through the plant cells, invading the wood and creating a cankered area, killing the stem.

Disease management

- Choose a planting site with well-drained, high organic matter, acidic soil, and which is not prone to spring frosts.
- Purchase only disease-free nursery stock from reputable suppliers.
- Avoid mechanical damage such as careless pruning and cultivating.
- Improve air circulation by pruning out the weakest stems and controlling weeds.
- Prune out and destroy diseased canes, now, before spring weather allows the canker fungi to develop further, as these are the source of spores.
- To avoid stressful growing conditions, keep the plants well-watered through prolonged periods of dry weather in the summer. Mulch plants to retain soil moisture.
- Dormant sprays of lime sulfur may help to reduce inoculum of the pathogen.
- Chemical control of canker diseases during the season is not very effective.

VEGETABLES

PEST WRAP-UP FOR 2007
by Ric Bessin

Well, 2007 was an unusual year as usual! April freeze followed by hot dry weather from mid spring until fall. The insect pest problems were unusual as well. With the prolonged hot, dry weather that seemed desert-like at times, we did see a new insect in central Kentucky that prefers those types of conditions, the silverleaf whitefly. Another insect pest that was at high levels in some areas is one that we seen a lot of the last few years, the western flower thrips. But the year was not all bad either, at least in terms of insect problems, corn earworm was at low levels until mid season and spider mites were not as serious as they could have been considering the hot, dry weather. European corn borer has remained at lower levels the past several years, this may be due in part to the use of Bt corn. Many corn producers will switch to a Bt hybrid when in a late planting or high risk situation that would normally result in high ECB moth production.

As I noted earlier, silverleaf whitefly appeared in Central Kentucky. This is the first time we had observed problems with this pest in our state. It was first seen on squash where it was causing a silvering of the upper leaf surface on the new growth. On tomatoes it caused a type of abnormal ripening of the fruit on some heirloom varieties, one side of the fruit would ripen normally while the opposing side would remain green. The injury is a result of the enzymes injected in the plant while the nymphs are feeding, and in some instances, only a few nymphs were able to cause these problems. Once the silverleaf whiteflies were controlled, the new growth appeared to develop normally.

Thrips, in particular western flower thrips, have been common the past several years. They are known as disease vectors in that they transmit the viruses that cause tomato spotted wilt and impatiens necrotic spot. We have had problems in the field with these viruses on tomatoes and peppers in the western region of the state. This past summer, we observed another type of damage to vine-ripened tomatoes that is called gold flecking. This type of damage doesn't appear to occur when the fruit are harvested at the breaker stage, but can be a problem when they are left in the field to fully mature. The thrips feed in the surface of the near ripe fruit causing numerous 'golden' spots and rings in the surface. This is not a result of virus transmission, rather this is a result of the direct injury during feeding.

Corn earworm, also known as the tomato fruitworm, soybean podworm, and cotton bollworm, has been a serious problem the past several years on sweet corn and late-season tomatoes. Entomologists throughout the Midwest have noted that on sweet corn the pyrethroids do appear to be as effective in controlling corn earworm as they were just 10 years ago. These observations have been made from small plot fields trails that compare performance of commercially available insecticides. The drop in performance for the pyrethroid-insecticide class has been substantial. Entomologists have been reluctant to label this as resistance (at least for now) as control failures in commercial fields have not appeared yet. This is a very serious issue that you will be hearing more of in the future because the pyrethoids have been the only economical and effective class of insecticide to control corn earworm in sweet corn. There is at least one promising new insecticide that has been effective in research trials, but it is not yet been approved for commercial use.

Other insect pests that were common in 2007 included striped and spotted cucumber beetles, squash bug, beet armyworm, stink bugs, European corn borer, cabbage looper, diamondback moth, imported cabbageworm, flea beetles, yellow striped armyworm, and Colorado potato beetle on various vegetable crops. But these pests generally appear each year, although their intensity varies somewhat from year to year.

One pest that has been rare in Kentucky the past 10 or more years has been the Mexican bean beetle. This is a type of lady beetle that feeds on beans leaves rather than

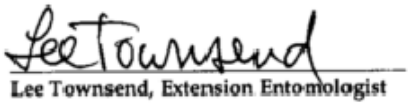
other insects. The yellow larvae are found on the undersides of bean leaves and cause a skeletonizing of the leaves. While I don't know why their numbers have dropped the past decade, it's good news when any pest population crashes in numbers.

LIVESTOCK

USE NON-SYSTEMIC INSECTICIDES FOR WINTER LICE CONTROL
by Lee Townsend

Lice thrive in the winter and can spread easily through the herd as cattle bunch together in response to cold temperatures. Steps taken now with newly purchased cattle can reduce problems later. Keep new animals separate from the rest of your herd until after they have had a thorough louse treatment. This generally means two applications of a pour-on contact insecticide. The first kills active adult and immature lice but does not kill nits or eggs on the hide. The second application is targeted at new hatchlings from the nits and any escapees that may still be around. After the treatment course, the new animals can be added to the herd with a minimal chance of problems. See ENT-11 for louse control options.

Application of systemic insecticides to cattle now can cause host-parasite reactions if cattle grubs are present. Cattle grubs are migrating through the bodies of infested animals now. Depending on the cattle grub species present, the maggots can be in or near the spinal canal or the walls of the esophagus at this time of year. Cattle may have an adverse reaction if the grubs are killed by a systemic insecticide while in these sensitive areas. No grub treatments should be applied now. Unless certified as treated, any animals purchased at this time of year should be treated twice for cattle lice before being added to the herd. If a grub treatment was not applied, be sure to use a non-systemic insecticide. Products containing permethrin or cyfluthrin are examples of safe choices. If the treatment history of the animals in not known, assume that cattle grubs are present and do not use a systemic product.



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.

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