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KENTUCKY PEST NEWS

ENTOMOLOGY • PLANT PATHOLOGY • WEED SCIENCE
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WATCH FOR:

Increasing POTATO LEAFHOPPER populations in alfalfa; CALICO SCALE egg hatch; feeding by BOXWOOD PSYLLIDS causes cupping of terminal leaves; SPRUCE SPIDER MITES causing yellowing of spruce, hemlock, and arborvitae; MAPLE PETIOLE BORERS may cause leaf drop of maples.

ARMYWORMS

ARMYWORMS ON THE, WELL, MARCH!
by Doug Johnson

Armyworm flight data for the first generation is pretty much history. Both the Princeton and Lexington trap catch numbers have fallen significantly. However, these data have provided us with significant predictive data for providing a "heads up" on the caterpillar stage.

Infestations are being reported all around western Kentucky. They are active in wheat, corn and in a few soybean fields. The most significant problems are being encountered in corn that has been planted into herbicide-killed wheat. This is just as we expected and predicted several weeks ago. However, there have been a few occasions where soybean is being fed upon at alarming rates. Though not considered a normal host for armyworm, soybean is on the known plant food list for this insect. Right now the most important activity is to find the fields that are being consumed and determine if an insecticide application is necessary.

In addition to crops planted into "killed" wheat, watch for armyworms moving out of the "killed" wheat into surrounding fields of corn and grass hay. This has also been reported from more than one location. In this case, insecticide application may be need along in the borders of fields that are being invaded.

I have not received reports of armyworm activity in central Kentucky. However, the caterpillars should be obvious soon if they are going to appear in damaging numbers. As noted before, populations in the central Kentucky area will be several days to a week later than those in western Kentucky.

Economic thresholds are available for armyworm in wheat (16, ½ to ¾ "worms per 4 esq.) and in corn (one worm on 75% of plants or 2 worms per plant on 25% of plants. Soybean is not so straight forward. The most important thing is to protect the seed leaves (cotyledons), and unifoliate leaves. By the time the first trifoliate emerges the 30% defoliation may be used as a threshold. Also, note Dr. Townsend's information on armyworm in pasture / hay fields at:

http://pest.ca.uky.edu/EXT/AW/Armyworm-ENT.pdf

Armyworms are not hard to kill if the application is made properly. In wheat, control is sometimes difficult because of the lush growth and large plant stand of this crop. In 2007 good application may be even more difficult as the earlier freeze has killed a great deal of tissue. This tissue is now settling down into a mat under which the armyworms can hide.

Insecticides for use against armyworm may be found in our Field Crops Recommendations found at: http://www.uky.edu/Ag/PAT/recs/rechome.htm.

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UNIVERSITY OF KENTUCKY, KENTUCKY STATE UNIVERSITY, U.S. DEPARTMENT OF AGRICULTURE, AND KENTUCKY COUNTIES, COOPERATING

FRUIT CROPS

PHOMOPSIS CANE AND LEAF SPOT IS ACTIVE ON GRAPES
by John Hartman

Despite a relatively dry spring this year, enough cool, wet weather occurred in early spring to allow for Phomposis cane and leaf spot disease development. Symptoms of this disease have been developing in recent weeks in many Kentucky vineyards. Cane and leaf spot disease is caused by the fungus *Phomopsis viticola*. At one time, it was thought that this fungus also caused dead-arm symptoms, but it is now known that *P. viticola* only causes cane and leaf spot while another fungus (*Eutypa*) causes the dieback characteristic of dead-arm. Incidence of Phomopsis cane and leaf spot appears to be increasing in many Kentucky vineyards and significant crop losses can occur in growing seasons with disease-favorable weather.

Symptoms. On shoots and leaves, infections give rise to black spots or elliptical lesions that appear mainly on the first three to four basal internodes. Although this phase of the disease can appear quite severe, crop loss due to shoot infections has not been demonstrated. Heavily infected shoots are more prone to wind damage. Lesions on shoots serve as an extremely important source of inoculum for cluster stem (rachis) and fruit infections in the spring.

Rachis and fruit infection is the phase of the disease that causes most economic loss. Fruit rot symptoms caused by Phomopsis generally do not appear until harvest. Rotted fruit are a light brown color with black fungal pycnidia that break through the berry skin; the berry soon shrivels. At this advanced stage, Phomopsis fruit rot can be easily mistaken for black rot. Recall that the black rot fungus does not infect berries late in the growing season, and black rot symptoms develop long before harvest.

Disease cycle. The causal fungus, *P. viticola*, overwinters in lesions or spots on one- to three-year-old wood infected during previous seasons. Cool weather and rainfall favor spore (conidia) release and infection. Conidia are released from pycnidia in early spring and are spread by rain to developing shoots and leaves. Shoot and leaf infection is most likely to occur during the period from bud break until shoots are 6 to 8 inches in length. Lesions appear three to four weeks after infection and are the symptoms growers are observing now.

Most fruit and rachis infections occur early in the season although they are susceptible to infection throughout the growing season. The fungus does not appear to be active during warm summer months, and most or all of its primary inoculum is probably released and expended early in the growing season. The tiny green fruits that are infected during this critical period may appear to remain normal. The fungus remains inactive in these fruits as a latent infection. When the fruit starts to ripen near harvest the fungus becomes active and causes the fruit to rot. While the fungus is relatively inactive during the warm summer months, it can become active during cool, wet weather later in the growing season. Thus, fruit rot that appears at harvest is probably due to infections that occurred during or shortly after bloom.

Management of Phomopsis cane and leaf spot disease requires both sanitation and application of fungicides.

- During the dormant season, prune out diseased canes as a sanitation measure that will reduce primary inoculum.
- Make timely fungicide applications for disease control. The critical period to provide fungicide protection for fruit and rachis infection is now when the fruit clusters are first exposed and continuing until two to four weeks after bloom.
- Be sure that the vineyard sprayer has been properly calibrated to provide complete coverage of all grapevine surfaces including leaves, stems, and flowers.
- For suggestions of fungicides to use and application timing for grape disease management consult U.K. Cooperative Extension Publication ID-94, Midwest Commercial Small Fruit and Grape Spray Guide, 2007, available at County Extension Offices statewide.

SOYBEANS

CURRENT STATUS OF SOYBEAN RUST IN U.S.
by Don Hershman

The current soybean rust situation in the U.S. is mixed. There is minimal disease activity in the southeast because of extreme drought conditions that have existed in Florida and Georgia most of the spring. This is good news, at least as far as soybean rust is concerned, because the dry weather has kept overwintered soybean rust levels from increasing.

The bad news is that soybean rust was found in south central Louisiana (in kudzu) on May 11, which is 53 days earlier than when the disease was found in Louisiana in 2006. Although the current level of soybean rust is very low, conditions have recently been very favorable for additional disease development. Thus, I am sure it is only a matter of time until additional finds are confirmed.

In 2006, soybean rust built up to substantial levels in Louisiana during the August to mid-September time frame

(soybean rust was first detected in Louisiana on June 30). Subsequently, soybean rust was found throughout the upper Mississippi River and lower Ohio River Valleys in October. Scientists generally believe that these finds were the result of spores being picked up in Louisiana, and distributed over a 1000 mile area, by a major storm system that moved through Louisiana and into the north during September 22-24, 2006.

Spread of the disease in 2006 occurred too late in the season to do ANY damage to soybean crops north of Louisiana. However, if this situation occurs in August of this year (based on the earlier find in Louisiana), we could see significant damage due to soybean rust in some soybean fields this year. No one knows for certain how things will turn out this year – it all depends on the weather. However, the early find in Louisiana is significant and bears watching. Continue to monitor current soybean rust conditions on www.sbrusa.net and on the Kentucky Soybean Association's Soybean Rust toll-free Hotline (888-321-6771, updated daily beginning June 1). For regular email updates, go to www.uky.edu/soybeanrust and sign up for e-mail updates.

LAWN & TURF

SMUT ON TALL FESCUE
by Paul Vincelli

A smut disease is showing up in a landscape situation on heads of tall fescue in southern Kentucky. Instead of flower parts, the flower stalks of infected plants produce black, powdery material referred to as "smut" The tillers that produce the smutty stalks are systemically (permanently) infected but likely appear completely healthy until the smut appears. This is an unusual disease in Kentucky, and one that should be easily controlled in lawns by mowing regularly at a normal height of 2-2.5 inches. Regular mowing prevents the flower parts--and therefore the smut--from forming.

We have not seen this smut in tall fescue pastures in Kentucky, but I think it would be good for Extension agents to have this disease on our collective "radar screens". If you see this smut on tall fescue in a lawn, pasture, roadside, etc, please submit that for diagnostic testing through your County Extension Agent.

SHADE TREES & ORNAMENTALS

CALICO SCALE ALERT
by Mike Potter and Dan Potter

In recent years, calico scales have become rampant on several landscape plants, including honeylocust, hawthorn, hackberry, sweet gum, yellowwood, dogwood, flowering crabapple, zelkova, and sugar and Norway maples. Infestations are so heavy in some cases that entire twigs and stems are covered by the scales and the trees are in decline.

Mature calico scales, *Eulecanium cerasorum,* are large, black and white globular-looking insects about the size of a pencil eraser. They have a soft, leathery body and when crushed ooze a gummy, wax-like fluid. The immobile, adult female is the life stage observed during the spring, attached to twigs, branches, and trunks. Some people mistake them for ladybugs, which are roughly the same size. Like other scale insects, the calico scale feeds by sucking plant juices. Heavy infestations can cause premature leaf drop, branch dieback and, coupled with other stresses, eventual tree death. During April and May the maturing female scale produce copious sticky honeydew (sugary liquid excrement) that glazes vehicles and other objects under infested trees, attracts wasps and other nuisance pests, and promotes growth of black sooty mold on infested trees.

The mature females are now dying. Underneath them are thousands of eggs which have begun hatching into crawlers. The crawler stage moves to prefers to the leaves where it settles along veins and sucks juices until moving back to the bark to overwinter. Another reason to take action against the crawlers is that they can become wind borne, spreading the infestation to other trees nearby.

Management
It's too late to impact the mature females, which turn brown and die just before crawler hatch. *However, the underlying eggs are hatching, and the crawlers will be settling on the leaves.* The yellowish, newly-hatched crawlers are tiny, but under close inspection their movement will be visible to the naked eye.

Insecticide applications, timed to coincide with emergence of young crawlers, will break the cycle of development and reduce the infestation. The most effective insecticides for crawler control are pyrethroids such as Talstar-One, Tempo (= Bayer Advanced Lawn & Garden Multi Insect Killer), and Scimitar (= Spectracide Triazicide). Sevin also can be used. So-so control of crawlers can also be achieved with 2% horticultural oil or insecticidal soaps. Thorough coverage of infested twigs, branches and adjoining leaves is important. The hatching period lasts several weeks. Pyrethroids have sufficient residual to control them with one application, but a second treatment, 2 weeks later, may be needed if using Sevin, soaps, or oil

Calico scales overwinter on the bark as flattened, grayish

nymphs. Treating with a pyrethroid in late March, or early April, as soon as the scales begin to swell, has been very effective in controlling calico scale infestations. That timing prevents the tree stress and honeydew problems caused by the maturing females in the spring.

LATENT INFECTIONS OF DIPLODIA TIP BLIGHT
by Amy Bateman, Plant Pathology Grad Student

Throughout the 1990s, Diplodia Tip Blight was rampantly killing Austrian pines on the University of Kentucky's campus. Aggressive measures to treat the trees with fungicides were regularly used, but to no avail; the trees kept dying. It was thought that possibly these trees, even though healthy looking, may have had latent infections of *Diplodia pinea*. A latent infection exists when the pathogen (here *D. pinea*) infects the host, is living inside the host, but doesn't produce symptoms, at least not right away. The thinking is that if the trees on campus had latent infections, external fungicide applications would not remove the fungus already present in the tree, and this fungus would have the potential to become "active" and become a symptomatic infection.

Previous studies have shown that *D. pinea* could be recovered from asymptomatic tissue of other pines, such as Jack Pine and Red Pine. Since *D. pinea* could create latent infections in these pine species, U.K. plant pathologists hypothesized that Austrian and Scots pines would also support latent infections. To test this hypothesis, various portions (new candles, buds, female and male flowers, young cones, old cones, needles, previous year's lignified stems) of symptomatic and asymptomatic Austrian and Scots pines were cultured onto nutrient media after first being surface-sterilized to kill any *D. pinea* that may be on the surface of the tissue. This culturing method would allow for any fungus that's alive inside the plant material to grow out where it can be identified.

But because culturing the fungus out of host tissue takes days and also destroys the tissue so that no further studies can be done, a new method of detection and identification was desired. The molecular technique called polymerase chain reaction (PCR) was used to isolate and amplify specific portions of DNA unique only to *D. pinea*. This amplified DNA is visualized as a band when passed through an electrophoresis agarose gel. Only if *D. pinea* is present in the sample, will a specific sized band be present in the gel. This entire process takes only hours, whereas the culturing method can take days to weeks. Also, only a very small portion of pine tissue is needed, so the PCR method of detection is not only less invasive and damaging to the tree, it also is highly sensitive and can detect very small amounts of *D. pinea*.

Through both culturing and PCR, *D. pinea* could be recovered, at least part of - if not all of - the time from all portions of the symptomatic and asymptomatic pine tissues. It was also found that as the percentage of diseased tips throughout the tree increased, so did the occurrence of healthy shoots with latent infections. Dissection studies of both symptomatic and asymptomatic tips done at U.K. found that *D. pinea* could be found throughout the symptomatic diseased shoot, but in the asymptomatic shoots it was mainly found in the outer portions of the stem (bark and phloem as compared to xylem and pith).

To test whether or not the *D. pinea* that was recovered from these latent infections could actually produce symptomatic infections, 3-year old Austrian pines were inoculated with *D. pinea* recovered from symptomatic tissue or from asymptotic tissue. Both the fungus that came from symptomatic shoots as well as the fungus that came from asymptomatic shoots produced symptomatic infections. In some cases inoculation with either fungus produced no symptoms, but when the inoculated stems were cultured out, *D. pinea* was found to have produced latent, asymptomatic infections. This shows that there is no difference in the fungus that produces latent versus symptomatic infections. However, there is still no direct evidence showing that latent infections in the field can switch to symptomatic infections.

The detection of latent infections in both Austrian and Scots pines in Kentucky has been an important discovery because it not only provides us more insight into how this fungus interacts with its host, but also provides a possible explanation as to why previous management tactics were failing.

INSTEAD OF FASHIONABLY LATE, HOW ABOUT A YEAR EARLY?
by Lee Townsend

Brood XIV of the periodical cicada is due to emerge in 2008 across much of Kentucky. It is common for some individuals to appear early and a few to appear late. Shad Baker reported finding a periodical cicada in Letcher County last week. We may see some scattered "early birds" from other locations but the main group will be out about this time next year. A wealth of information and brood maps are available on line at the Periodical Cicada page at
http://insects.ummz.lsa.umich.edu/fauna/michigan_cicadas/Periodical/Index.html

INSECT PESTS OF HUMANS

2007 WEST NILE VIRUS OUTLOOK
by Lee Townsend

The 2007 West Nile virus (WNV) - mosquito season is underway. According an Illinois news story, West Nile virus was identified in groups of mosquitoes collected last week in suburban Chicago. Now is a good time to review Kentucky's WNV history. There has been a dramatic decrease in detected cases since the 2002 - 04 outbreak when the virus was detected throughout the Commonwealth. The table below summarizes West Nile virus activity in Kentucky from 2002 - 2006. These data came from the Ky Cabinet for Health Services, Dept of Public Health and are available in numerical and map form at http://chfs.ky.gov/dph/epi/westnile.htm.

Positives	2002	2003	2004	2005	2006
Horses	513 (78)*	102 (54)	8 (8)	9 (7)	17 (12)
Birds	603 (101)	111 (46)	22 (12)	2 (2)	8 (7)
Pools	55 (10)	10 (5)	4 (2)	1 (1)	1 (1)
Human cases	75 (32)	14 (12)	7 (5)	5 (4)	6 (4)

*no. cases (no. counties)

Pools refer to groups of mosquitoes collected by trapping programs. These mosquitoes are identified to species and tested in groups (pools) of 50 individuals. A positive pool means at least one mosquito in the group gave a positive response in the test.

The numbers of diagnosed human cases were low during 2004 - 2006 but the location of infected individuals shifted. The 7 cases in 2004 were scattered – Boone, Jefferson, McCracken (2), Nelson, and Russell (2). The 2005 cases were from Jefferson, Grant, Kenton (2), Campbell counties and shifted to Christian (3), Jefferson, Lincoln, Todd in 2006.

How can people protect themselves? The message from the Centers for Disease Control remains the same – 1) avoid mosquito bites, 2) reduce nearby breeding sites, and 3) help in community control efforts.

1) Avoid mosquito bites by using repellents on exposed skin when outdoors and cover skin during peak mosquito activity. Install or repair screens. The house mosquito, our most important WNV vector, is active from dusk to dawn and enters structures thru openings in doors or windows.

2) Reduce breeding sites around your property by draining standing water in clogged gutters, low spots, and exposed containers.

3) Help community efforts by reporting dead birds to the health department, clean up breeding sites off of your property, become informed about mosquito control programs in your area.

West Nile virus is established as a seasonal epidemic disease in North America that flares up in the summer and continues into the fall. WNV affects the central nervous system. Most people exposed will not show any symptoms. However, mild symptoms may include slight fever and/or headache, possibly with skin rash and swollen lymph glands. A rapid onset of high fever with head and body aches, neck stiffness, disorientation, stupor and muscle weakness marks more severe infections. Those who may be most at risk are persons over the age of 50 and those with compromised immune systems. According to the Centers for Disease Control (CDC) less than 1 percent of the people infected with the disease develop a serious illness, about 20 percent display mild symptoms and 80 percent will not show any symptoms.

DIAGNOSTIC LAB-HIGHLIGHTS
by Julie Beale and Paul Bachi

Agronomic samples over the past week included Leptosphaerulina leaf spot on alfalfa; and target spot, Pythium root rot, and bacterial blackleg on tobacco.

On fruit and vegetable samples we have diagnosed potassium and phosphorus deficiency on strawberry; black rot on cabbage; and bacterial canker, growth regulator/ herbicide injury, fertility problems, sunscald and flea beetle feeding on tomato.

On ornamentals and turf we have seen Pythium root rot and thrips injury on petunia; acid soil problems and oedema on geranium; black root rot on holly; petiole borer on maple; Phytophthora root rot and white pine decline on pine; Seridium twig dieback on Leyland cypress; dollar spot on bentgrass; and loose smut on fescue.

INSECT TRAP COUNTS
UKREC, Princeton KY
Kentucky — Tennessee
May 11-18, 2007

►***Jackson, TN***
Black cutworm 4
True armyworm.....4
Corn earworm.....1
European corn borer 4
Southwestern corn borer 1
►***Milan, TN***
Black cutworm 3
True armyworm.....4
Corn earworm.....2
European corn borer 0
Southwestern corn borer 0
►***Princeton, KY***
Black cutworm 0
True armyworm.....35
Corn earworm.....0
European corn borer 0
Southwestern corn borer 1
►***Lexington, KY***
Black cutworm 1
True armyworm.....112
Corn earworm.....0
European corn borer 0
Southwestern corn borer 0

This season insect trap counts will be provided for locations in Kentucky and Tennessee.
View trap counts for past seasons and the entire 2007 season at –
http://www.uky.edu/Ag/IPMPrinceton/Counts/2006trapsfp.htm
View trap counts for Fulton County, Kentucky at -
http://ces.ca.uky.edu/fulton/anr/
For information on trap counts in southern Illinois visit the Hines Report at –
http://www.ipm.uiuc.edu/pubs/hines_report/comments.html
The Hines Report is posted weekly by Ron Hines, Senior Research Specialist, at the
University of Illinois Dixon Springs Agricultural Center.

Lee Townsend

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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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