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KENTUCKY PEST NEWS

ENTOMOLOGY • PLANT PATHOLOGY • WEED SCIENCE
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WATCH FOR:
CUCUMBER BEETLES, SQUASH BUGS and SQUASH VINE BORERS; COMMON STALK BORER damage; GALLS apparent on shade trees, especially oaks; BAGWORMS on deciduous and evergreen landscape plantings

TOBACCO

BLUE MOLD UPDATE
by Kenny Seebold

Active blue mold was found June 13 in Fayette County on plants in the field. A small number of plants were affected, and the severity of the disease was low. All tobacco on the farm in question was treated with Quadris as a preventive measure. Since that time, no new reports of blue mold have been found in the field in Kentucky. However, blue mold was observed in the Greenville TN area on field-grown tobacco and these plants had come from the greenhouse where blue mold was reported on June 7.

The overall risk to tobacco in Kentucky appears low at this time. The hot, dry weather that has dominated our climate in recent weeks is unfavorable for infection or of spread of blue mold; however, we have had periods of rain and cooler temperatures in some parts of the state. To be on the safe side, growers (particularly those east and south of Fayette County) need to scout tobacco in the field and for the presence of disease. Begin preventive applications of fungicide if disease is found. Unused tobacco transplants should be destroyed to eliminate a potential source of inoculum should they become infected.

Please let me know if you find blue mold or suspect it in your area. You can visit the Kentucky Tobacco Disease Information page for regular updates on blue mold and other diseases (http://www.uky.edu/Ag/kpn/kyblue/kyblue.htm).

BLACK SHANK AND THE DROUGHT OF 2007
by Kenny Seebold

The 2007 growing season has been a difficult one for Kentucky's tobacco farmers, particularly because of the drought that has gripped the state. As would be expected, dry conditions are beginning to take a toll on tobacco in the field from a physiological standpoint. We also have seen a significant increase in the number of reports of black shank over the past week to ten days. In early June, a relatively small amount of black shank had been reported across Kentucky; however, during the week of June 18 the number of cases of the disease increased dramatically. Although we consider black shank to be a wet-weather disease, severe damage can occur during a drought and this is the scenario we now face. The plants that are now dying from black shank were likely infected during one of the few rain events that took place earlier in June. Under dry conditions, plants with moderate levels of disease will not be able to take up enough water to survive and will wilt quickly. Once wilted, heat and a lack of soil moisture result in sudden and widespread mortality of plants. Wilting and death can be so sudden that plants remain green when they die, not showing the yellowing that is characteristic of black shank. The classic blackening of the stem from which

black shank takes its name can be less pronounced as well during a drought because of the quick disease cycle. It is not uncommon to find few symptoms above the soil line. Instead, girdling lesions can be observed at or near the root tip and this is why water uptake is restricted, causing plant death during the drought. Even a tobacco variety with high levels of resistance to the black shank pathogen (*Phytophthora nicotianae*), such as 'KT 204', will suffer greater-than-anticipated losses during a drought. Infected plants pose another risk to healthy plants around them because they represent a source of inoculum that can explode should significant rainfall occur later in the season.

Growers with black shank can apply the soil fungicide mefenoxam as a rescue treatment. Two products, Ridomil Gold EC and Ultra Flourish, are available and can be applied at first cultivation (if applicable) and at layby. Rescue applications of mefenoxam will be most effective if a variety with moderate-to-high levels of resistance has been planted, such as 'TN 86', 'TN 90', or 'KT 204'. Varieties with little or no resistance to Race 1 of *P. nicotianae* in particular will likely not benefit from mefenoxam if the incidence of black shank is moderate to high in a field. The rate for Ridomil Gold is 1 pt/A (per treatment), while Ultra Flourish, which contains half the amount of mefenoxam found in Ridomil Gold, is labeled at 1 qt/A (per treatment). Applications should be directed at the soil and stems of plants. The fungicide should be incorporated as quickly after application as possible, either mechanically or by irrigation (natural rainfall or overhead irrigation). Soils need adequate levels of moisture to activate mefenoxam and permit its uptake into the plant. Secondary spread of black shank is considerably less likely in a drought than in rainy weather; however, heavy rains or irrigation could result in heavy losses to black shank in fields with even low levels of disease, so mefenoxam should be applied in advance of anticipated moisture events. The black shank pathogen can be moved easily on equipment and feet! Growers need to sanitize properly when moving between infested and clean fields.

STALK BORERS CAN HIT PLANTS IN BORDER ROWS
by Lee Townsend

Stalk borers are caterpillars that feed inside a wide range of plants. Small larvae can easily fit into grass stems but must move as they get larger or as their host plant declines. Displaced stalk borers will tunnel into the first plant they find that will accommodate them and will stay there as long as the plant remains relatively healthy. As a result, they can cause wilting tobacco plants along field borders or waterways. The larva first may chew into a stem causing a single leaf to wilt and turn yellow, then move into the stalk affecting the entire plant. While an infested plant is stunted, the borer usually remains in it rather than attacking others. This helps to minimize what appears to be a potentially significant loss.

Foliar sprays will not enter the plant and kill borers. It would take a very lucky application to catch wandering borers before they enter plants, well before symptoms appear. Check wilted plants to rule out other causes.

CORN

WATCH FOR CORN ROOTWORM BEETLES TO MAKE DECISIONS FOR NEXT YEAR
by Ric Bessin

Western corn rootworm beetles have begun emerging throughout the state. Unlike other corn producing states to our north, western corn rootworm continues to be a problem only in continuous corn in Kentucky. Each year in late June the adults begin to emerge after a just less than a month of feeding on corn roots. Over the next several weeks the adults will be active in and about corn fields, mating and laying eggs in soil cracks around the bases of corn. These eggs will remain dormant until next spring when they will hatch and the larvae will search again for corn roots.

During the next few weeks, corn producers should routinely monitor their fields for adult corn rootworm activity as this information is needed to determine rootworm risk in 2008. If at anytime during the next few weeks, the number of rootworm beetles per plant exceeds an average of one then a control for rootworms will be needed next year. Possible options consist of rotating to another crop, using a soil insecticide or seed treatment, or using a Bt hybrid that controls corn rootworm.

In some fields large numbers of rootworms are emerging before corn has pollinated. The beetles can feed heavily on corn attacking the upper surfaces of leaves and, when available, the corn silks. If there are sufficient numbers of beetles that are keeping the silks clipped back to 1/2 inch or less and the corn has not yet pollinated, then an insecticidal control for the adults may be warranted. Generally this may require 10 or more adults per silk and has not bee common in Kentucky.

FRUIT CROPS

GRAPE POWDERY MILDEW IS A THREAT EVEN IN A DRY YEAR
by John Hartman

Although drought and absence of rainy weather has slowed the development of many grape diseases in Kentucky this year, powdery mildew is not slowed by lack of rain. Powdery mildew can infect all green parts of the grapevine including leaves, fruits, and young stem tissues. If not controlled on susceptible cultivars, the disease can reduce vine growth, yield, quality, and winter hardiness. Disease losses due to fruit infection can be severe and can result in complete loss of the crop. Cultivars of *Vitis vinifera* and its hybrids (French hybrids) are generally much more susceptible to powdery mildew than are native American cultivars such as Concord. On susceptible cultivars, the use of fungicides for powdery mildew is important for disease management. Failure to provide adequate control of powdery mildew early in the growing season can result in increased levels of other fruit rots such as Botrytis bunch rot and sour rot. Powdery mildew is caused by the fungus *Uncinula necator*.

Symptoms. Infected leaves are most easily recognized by the dusty appearance or white powdery growth in spots or areas on the upper leaf surface. Young expanding leaves that are infected may become distorted and stunted. Severely affected leaves may curl upward during hot dry weather. Infected berries often are misshapen or have rusty spots on the surface and severely affected fruit often split open. When berries of purple or red cultivars are infected as they begin to ripen, they fail to color properly and have a blotchy appearance at harvest. Berries are susceptible to infection from bloom through a few weeks after bloom. Concord grape berries are quite resistant within two to three weeks after bloom.

Disease history. The fungus overwinters as fungal fruiting structures called cleistothecia lodged primarily in bark crevices on the grapevine. In the spring, airborne spores (ascospores) released from the cleistothecia are carried by wind and they germinate on any green surface of the developing vine, resulting in primary infections. After infection, the fungus develops and forms conidia (another type of spore) over the infected area after six to eight days. The conidia and fungal mycelium give a powdery or dusty appearance to infected plant parts. The conidia serve as secondary inoculum for new infections for the remainder of the growing season. Infection and disease development are favored by temperatures of 68□ to 77□F, but the fungus may be active from 59□ to 90 □F. Hotter temperatures inhibit the fungus. High relative humidity, 40 to 100%, is conducive to germination of conidia and infection. Free moisture, especially rainfall, is detrimental to the survival of conidia.

This need for high humidity but not free moisture is in contrast to most other grape diseases, such as black rot and downy mildew that require free water on the plant surface before the fungal spores can germinate and infect. Low, diffuse light also favors powdery mildew development. Note that powdery mildew can be a serious problem during growing seasons such as this when it is too dry for most other diseases, such as black rot or downy mildew to develop. Cleistothecia are formed on the surface of infected plant parts in late fall. Many of them are washed into bark crevices on the vine trunk where they overwinter to initiate primary infections during the next growing season.

Powdery Mildew Disease Management. The primary focus of disease management is to be aware of cultivar susceptibility and to select appropriate fungicides. Consult with U.K. Cooperative Extension publication ID-94, Midwest Commercial Small Fruit and Grape Spray Guide - 2007, available at County Extension Offices statewide.

- Control primary infections early, especially on susceptible cultivars. If primary infections are controlled until all the ascospores have been discharged, the amount of inoculum available for causing late-season (secondary) infections is greatly reduced. A primary infection caused by one ascospore will result in the production of hundreds of thousands of conidia, each of which is capable of causing secondary infections.
- Use fungicides to control fruit infection from immediately prior to bloom through two to four weeks after bloom. Even though the berries become resistant with age, cluster stems (rachis) and leaves remain susceptible throughout the season. Infections allowed to progress even after harvest will reduce winter hardiness of the vines.
- Effective fungicides include Abound, Bayleton, Elite, Endura, Flint, JMS Stylet Oil, Nova, Pristine, Procure, Quintec, Rubigan, Sovran, and Sulfur. Follow label directions and be sure to alternate fungicides with different modes of action over the course of the season.
- Plan for a full-season fungicide program for powdery mildew control on susceptible cultivars.
- Cultivars that are highly susceptible to powdery mildew include: Cabernet Franc, Cabernet Sauvignon, Chancellor, Chardonnay, Chelois, Einsett Seedless, Gewurtztraminer, Jupiter, Leon Millot, Limberger, Merlot, Moore's Diamond, Muscat Ottonel, Pinot Gris, Pinot Meunier, Pinot blanc, Pinot noir, Riesling, Rosette, Rougeon, Sauvignon blanc, Seyval, Vidal blanc, Vignoles, and Villard Noir.
- Cultivars that are only slightly susceptible to powdery

mildew include: Canadice, Cayuga White, Chambourcin, Cynthiana/Norton, Ives, Marquis, Mars, Melody, Steuben, and Traminette.
- Thin out the canopy to reduce humidity and reduce powdery mildew infections.

VEGETABLES

SQUASH VINE BORER MOTHS ACTIVE
by Ric Bessin

Squash vine borer moths are active and preventive sprays may be needed in some squash and pumpkin fields in Central and Eastern Kentucky. Squash vine borer is a day-flying clear wing moth (however, this species does not have clear wings, it is a paper wasp mimic) that will deposit eggs on the stems of some cucurbit crops in late June and July. Once the eggs hatch and after the larvae tunnel into the stems of the plants, insecticides provide no control. For that reason, insecticides need to be in place before the eggs begin to hatch.

Many growers are using soil applied neonicotinoid insecticides at planting in cucurbit crops to control cucumber beetles and reduce squash bug, however, these treatments have no effect on squash vine borer. In addition, these treatments has mostly run out, so producers will need to resume scouting for cucumber beetles and squash bug again.

SHADE TREES & ORNAMENTALS

BEWARE OF BAGWORMS
by Lee Townsend

While arborvitate, juniper, and cedar are preferred food plants, other conifers and deciduous species also are fair game for bagworms. These easily overlooked, camouflaged caterpillars can cause a lot of damage before they are detected. Bagworms wear what they eat, their silken cases are covered with bits of foliage as they feed, and their bags provide physical protection, as well as making them difficult to see.

Bagworms can be controlled with foliar sprays of Bt products or other insecticides labeled for shade trees and ornamentals if infestations are detected in time to take action. Bt products (Dipel, etc) provide a selective means of treatment which preserves natural enemies that may also be present. However, Bt generally works best on the smaller stages of caterpillars and is not as effective against larger larvae (bags 1 inch or more in length).

Timing is a big factor in preventing serious defoliation in landscapes. It is easy to overlook infestations unless plants are checked carefully for this cryptic insect. If the cone-shaped bags are abundant, then an insecticide application can be used to reduce their numbers. Most feeding occurs during the last stage of development so damage can appear "overnight". Early detection helps to reduce this complication. Complete spray coverage is important because most bagworm control probably comes from their consumption of treated leaves. Their bag protects them from direct contact with spray droplets and treated surfaces.

FATE OF AUSTRIAN AND SCOTS PINES IN KENTUCKY
by Amy Bateman, Plant Pathology Grad Student

Over the past decade, Diplodia Tip Blight, caused by the fungus *Diplodia pinea*, has decimated the Austrian pine population on the University of Kentucky campus. At one point, there were over 500 Austrian pines on campus, and now over half of these trees have been removed due to tip blight, and almost all of the trees left are showing symptoms of tip blight.

In Scots pine Christmas trees, the devastation can be just as bad as that seen in Austrian pines. Overall, the trees aren't as diseased as the Austrian pines, but this is mainly due to the fact that the Scots pines do not live as long as the Austrians because they are removed typically after 7 years, with or without disease, and growers will remove trees well before the disease levels get extremely high. For an industry based on aesthetics, just a small amount of diseased tips is a problem.

This disease is known to infect young, non-lignified tissue early in May as the candles elongate. The fungus is believed to produce toxins that destroy the host tissue, and even before severe symptoms appear, the fungus has almost completely colonized the shoot. Many new infections can occur each spring. Due to the large amount of spores that are produced on this dead material that is often left on the tree or surrounding ground. many new infections can occur each spring.

Symptoms do not necessarily occur every time that the fungus infects the tree. Some infections are walled off by the tree and create latent infections. It is believed, however, that these latent infections have the potential to break past the host barriers and kill the host tissue, creating symptoms. One such factor that may enhance this is stress, especially drought stress. Unfortunately, drought stress is very common in Kentucky, and has been so over the past 10 years. It is believed that drought stress may weaken the trees so that the fungus can proliferate and kill more tissue than it originally would have, thus creat-

ing devastation throughout the tree.

Many management tactics have been tried, such as fungicide sprays, fungicide injections, Cambistat drenches, and pruning dead branches, but nothing has stopped infections from occuring and spreading. The one management tactic that may have some effect on young trees is to greatly reduce stress, especially drought stress. But on the UK campus, all of the Austrian pines are mature and fairly heavily diseased, so reducing stress would generally not be that effective. Also because trees are spread out all over campus, it is impractical to water all of these trees, and to water them sufficiently so as to greatly reduce any drought stress. Most Christmas tree farms do not water their trees once they are established after transplanting. Watering on a regular basis is one recommendation that would be beneficial not only to reducing drought stress, but also to increase overall tree health, which in turn could decrease the number of symptomatic infections.

In general, the overall fate of Austrian and Scots pines in Kentucky is not good. Many landscape trees are already stressed by growing in non-natural urban conditions, and the amount of drought, such as we are experiencing this year, only adds to that stress. Unless new management tactics are found to be effective for reducing the amount and spread of infections, it would be best to not plant Austrian and Scots pines in Kentucky and expect them to remain healthy for a long time.

WEATHER

HOT DRY WEATHER AND ARTHROPOD / INSECTICIDE PERFORMANCE
by Lee Townsend

Higher than normal temperatures can affect insecticide performance and target pest behavior, things to keep in mind when treatments are necessary. Unfortunately, the relationships vary so it is hard to make blanket statements. Forewarned is forearmed so it does allow follow-up and evaluation to catch potential problems in time to take other steps.

Arthropods are cold-blooded, their body temperature is usually close to the air temperature in their environment. As their temperature increases so does the rate of their biological processes, metabolism, digestion, etc. Within normal ranges, these rates double with every 10 C temperature increase. This can result in an increase in insecticide toxicity as temperature increases. In general, the toxicity of organophosphate (Orthene, malathion, etc) and carbamate (Sevin) insecticides follows this pattern while the opposite can be true for pyrethroid insecticides. Their effect on insects can decrease with higher temperatures. This is not always the case but it is something to watch. During sustained periods of temperatures above the mid-80s, it may be better to use OP or carbamate insecticides or to wait for temperatures to moderate before making an application. In addition, low humidity and high temperatures may cause small spray droplets to evaporate before the land on their target. This can be avoided by spraying during cooler periods of the day or changing nozzles to get larger droplets. Finally, hot weather may cause insects or mites to move down the plant to find shade and higher humidity. This can increase control problems, especially when using contact insecticides, because the pests are more protected by plant foliage.

Since responses vary with pest species, check plants 3 to 5 days after treatment to assess control effectiveness. This can keep you from being surprised if control was less than you expected.

DIAGNOSTIC LAB-HIGHLIGHTS
by Julie Beale and Paul Bachi

Agronomic samples over the past week included Leptosphaerulina leaf spot on alfalfa; black shank (numerous samples), soreshin, tomato spotted wilt virus, potassium deficiency, and Fusarium wilt on tobacco.

On vegetable samples we have diagnosed root/stem rots caused by Fusarium sp. and Rhizoctonia sp. on bean; Rhizoctonia, Pythium and Fusarium root rots, southern blight, Fusarium wilt, tobacco mosaic virus and blossom end rot on tomato.

On ornamentals and turf we have seen leaf streak disease on daylily; Rhizoctonia stem/root rot on snapdragon; Stigmina needle cast on spruce; drought stress, transplant shock and spider mite injury on many tree and shrub samples; and summer patch on annual bluegrass.

INSECT TRAP COUNTS
UKREC, Princeton KY

Kentucky — Tennessee

June 15-22, 2007

►***Jackson, TN***

Black cutworm	0
True armyworm	100
Corn earworm	0
European corn borer	0
Southwestern corn borer	0
Fall armyworm	0

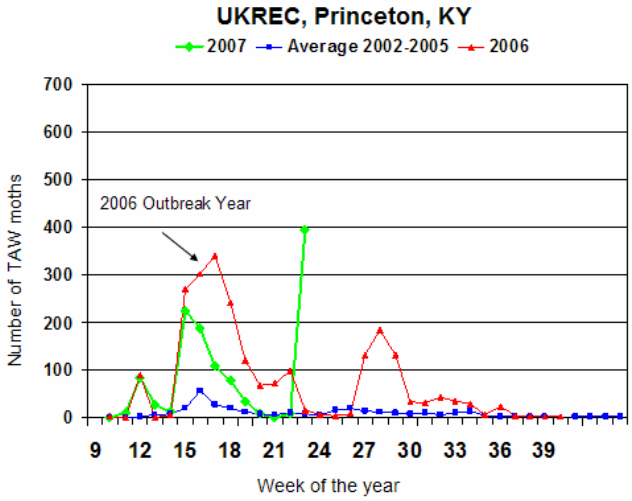
►***Milan, TN***

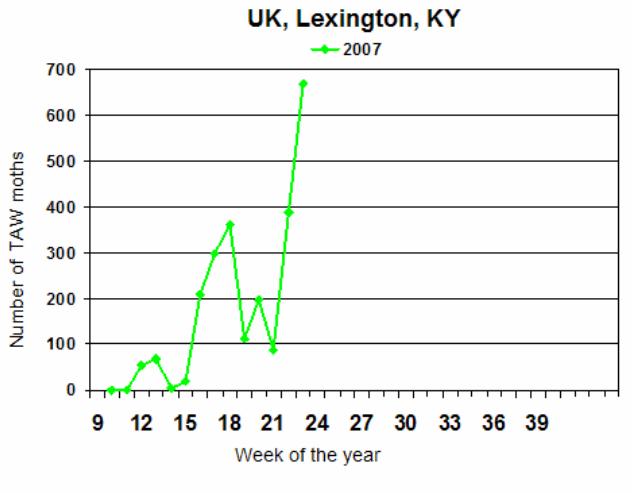
Black cutworm	0

True armyworm.....0
Corn earworm.....0
European corn borer 0
Southwestern corn borer 3
Fall armyworm 0

►*Princeton, KY*
Black cutworm 10
True armyworm.....139
Corn earworm.....33
European corn borer 0
Southwestern corn borer 3
Fall armyworm 0

►*Lexington, KY*
Black cutworm 117
True armyworm.....501
Corn earworm.....8
European corn borer 1
Southwestern corn borer 0
Fall armyworm 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.