UNIVERSITY OF KENTUCKY
COLLEGE OF AGRICULTURE
Lexington, Kentucky 40546-0091

COOPERATIVE EXTENSION SERVICE

KENTUCKY PEST NEWS

ENTOMOLOGY • PLANT PATHOLOGY • WEED SCIENCE

On line at - http://www.uky.edu/Agriculture/kpn/kpnhome.htm

Number 929 August 13, 2001

ANNOUNCEMENTS

The 31st Annual UK Pest Control Short Course will be held September 25 - 27, 2001. Call Darlene Thorpe (859) 257-5955 for more information.

TOBACCO

CURRENT BLUE MOLD STATUS

by William Nesmith

Most of the region remains under either a blue mold warning or watch, so keep controls in place in tobacco that has not reached the topping stage. The return to cooler temperatures could result in a sharp increase in blue mold activity.

Blue mold development is highly variable in the region, ranging from no activity to hot spots in fields, to major crop damage. Had the region not experienced the hot nights starting in late July, widespread damage from blue mold probably would have occurred. However, because of the hot weather and wounded plants (storm damage and leaf diseases), considerable bacterial soft rot is associated with much of this crop, which will greatly increase the potential for houseburn in this crop, requiring growers to increase their attention to details of harvesting and housing.

Several have requested an explanation for why blue mold has not destroyed the crop like it did with a similar wet period in late July 1996. Yes, we had the same rain and fogs, but there are two big differences. First, in 1996 we set a lot of blue mold with the transplants, so inoculum was more uniform. This time, transplanting infested plants did not occur until mid-June or so, for the most part. Most of the early blue mold in Kentucky was metalaxyl-sensitive, which was quickly controlled with the use of Ridomil Gold and Ultra Flourish, especially in communities with black shank concerns. But more important, was the difference in night temperatures. Blue mold is a cool, wet weather disease and the night temperatures this time around were about five degrees too high during the wet events. What blue mold likes is the type of weather we experienced on July 8 of this year, a late afternoon rain followed by cool nights into the 60's and heavy fog. During the recent 20-day wet event, we had cloud cover at night and saturated soils and saturated air, causing the temperatures to remain warm and above ideal for the disease, but not totally outside its range. This recently weather pattern was much more favorable for target spot and frogeye, than it was for blue

mold. Consequently, fields located in cooler sites, have been hit hard, while warm sites escaped serious damage from blue mold, sometimes to be hit hard with either target spot or frogeye.

Harvest is well under way and in most areas the early-set crop has mild leaf spotting, but escaped serious damage from blue mold. The damage in mid-set crops is confined mainly to foliage spotting, especially in the lower leaves, and systemic vein and mid-rib damage in the upper leaf positions, with some fields having scattered to 30% incidence of systemic blue mold. In late-set crops, some fields have been set with systemically infected plants, and in such, damage is near total. Most of this type damage is in small plantings in northern and eastern counties, however.

The cooler weather predicted for this week should result in a marked increase in new blue mold activity in fields that have not been topped or very recently topped crops of lush tobacco. Be especially watchful in lush tobacco in bottom-land fields or other areas of depression. Remember that much of Kentucky remains under a blue mold warning, as does southern Ohio. Most areas have had the recent moisture to drive blue mold, but fortunately, the night temperatures during those rainy events were just a little too high for ideal blue mold development. Where night temperatures are below 72°F by midnight, with fog and lush tobacco, there should be concern, especially when the night temperatures are below 70°F at midnight. The cooler nights, into the mid 60's, expected this week could cause blue mold to increase markedly.

BACTERIAL SOFT ROT (HOLLOW STALK, LEAF ROT AND LEAF DROP) IN TOBACCO
By William Nesmith

As a consequence of the wet growing seasons being experienced, tobacco growers should expect increased activity from a bacterium called *Erwinia carotovora* subsp. *carotovora*. The diseases it causes are blackleg in transplants, hollow stalk in the stems, and bacterial soft rot / drop of leaves - all occurring as a stinking, slimy rot that develops very quickly under hot, humid conditions, especially in wounded and over-fertilized crops. This same organism can also cause houseburn of tobacco, especially the slimy rot that occurs prior to yellowing. So, expect greater houseburn potential in crops harvested with hollow stalk and soft rot. These diseases are very sporadic in occurrence from season to season and farm to farm, but can cause extensive losses at times.

This soft rot bacterium is a natural inhabitant of all soils and also hosted by most weeds. It also develops on leaf and stem surfaces during wet weather and awaits an opportunity to enter through wounds. Although highly effective controls are not available, there are some cultural steps and attention to curing management that will help reduce losses from these diseases. Since there are no rescue treatments, certain alternative practices warrant consideration during protracted wet seasons.

Hollow stalk in the field is usually seen shortly after topping through cutting time. Most infections occur during topping through wounds made by the topping process, especially rough wounds that hold water. The bacterium begins to rot the stalk pith, spreading rapidly downward. The leaves begin to wilt and droop, starting at the top of the plant, and most fall off before or during cutting. Blackened areas are often present on the outer parts of the stalk. The disease can begin, however, at any point of wounding on the stalk, i.e. hail injury, dead suckers, other diseases, etc.

Bacterial soft rot, caused by this same bacterium, can occur on leaves at any stalk position, especially the lower leaves after the canopy has closed. When it develops in this form, the bacterium often does not invade the stalk at this stage, because the leaves drop off, due to hormonal changes, before the bacterium invades the leaf traces. But in some seasons, the bacterium can invade the stalk before leaf drop can occur, resulting in cankers and hollow pith in the lower parts of the plant, but not the top. Fields at greatest risk of this leaf phase of the diseases are those with very poor air movement, experiencing very rapid growth - being pushed with nitrogen - or those with hail injury or blue mold.

The alternative practices worth consideration may complicate normal production methods, so growers are not likely to make adjustments unless they appreciate the potential for crop loss and understand the basic pathology involved. There are two key factors of pathology driving this disease: One - The pathogen is a wound invader, so wounds are needed for the pathogen to cause disease. Two - this pathogen becomes a resident of the tobacco leaf

surface during wet weather, living on the leaf surface and in small wounds. It will remain there and multiply as long as humidity remains high. Little can be done about this second point. Consequently, reducing wounding and improving wound healing are very important. Be especially aware of its explosive potential when wounding succulent crops during hot, humid, overcast weather or in shady sites. Wound healing is tied in with maturity.

These diseases are difficult to control, and no rescue treatments are available once infections have occurred. Taking steps to reduce wounding during topping offers the best means of prevention. Top at the recommended stage and carefully remove any suckers that might be present. Suckers left on the plant and killed by sucker control chemicals become ideal sites for hollow stalk to occur. Plants with fully expanded flower heads require special attention, because breaking out such tops usually leaves a wound that will hold water. Tops of advanced maturity should be removed with a knife, with the cut made on an angle sloping towards the sunny side of the plant to aid drying. Yes, I know that slows you down, but that is the price paid for not topping when the plant was younger - at the recommended stage. Topping and suckering during damp or cloudy weather increases hollow stalk activity - yes , I know it is easier to do in the cool of the day but remember the plants are wet. Workers rubbing soil on their hands to remove excess gum increase the spread of the hollow stalk pathogen. If plants with hollow stalk are encountered during topping, they should not be touched by those doing the topping in order to reduce the chances of spread. Such early infections are most likely to occur in low, wet or shady areas of the planting.

The method of sucker control can affect the potential for hollow stalk. Sucker control chemicals that actually kill the suckers, those with contact type activity, tend to increase hollow stalk in wet seasons. Apparently, the dead sucker becomes an ideal site for the bacterium to attack and enter the stem. We have observed some very serious episodes where mineral oil, fatty alcohols, or Prime+® have been used to kill suckers, especially when the sucker is large. Also, serious hollow stalk and soft rot of leaves has been observed when crops of succulent tobacco were damaged with high rates of MH-30. In other words, take steps to avoid stalk and leave damage where possible and realize that the damage you can get by with in drier seasons can become costly in wet seasons.

STINK BUGS ON TOBACCO
by Lee Townsend

Single wilted leaves on tobacco plants usually are the result of feeding by stink bugs. Most commonly the damage is done by either the brown or the one-spotted stink bug. Both are about 1 " long brown, shield-shaped insects with a light yellow underside.

Enzymes injected into the plant by the sucking mouthparts as stink bugs remove sap will cause that leaf to wilt or collapse. On hot sunny days wilted leaves can be scalded. Frequently the leaf will recover and the only permanent damage is death of tissue in about a quarter-sizes or larger area immediately around the feeding site. The dead tissue will drop out leaving holes surrounded by yellow to brown areas.

Initial symptoms require several minutes to an hour or more to develop so the culprit may be long gone by the time the injury is apparent. Consequently, insecticide sprays in response to symptoms may be useless. Stink bugs are good fliers and move frequently from plant to plant, as well as into and out of the field. Because of their transient nature and generally minimal damage, insecticide applications specifically for stink bug are rarely justified.

CORN

ESTIMATING POTENTIAL YIELD LOSS DUE TO GRAY LEAF SPOT OF CORN
by Paul Vincelli

Due to the expansion of conservation tillage practices, gray leaf spot has become a significant threat to producing top yields of corn on many farms. Fortunately, many hybrids are now available with partial resistance to the disease, so yield loss is not as common as it was five years ago. While this disease can cause significant yield loss (up to 70% in very severe outbreaks on a susceptible hybrid), the disease often develops as the crop approaches maturity, such that dramatic yield loss

is uncommon in Kentucky. Nevertheless, yield loss does occur from reduced grain fill, particularly if disease develops above the ear leaf within two weeks of silking. In addition to direct loss of kernel size and lower test weights, a severe outbreak of gray leaf spot may lead to reduced stalk strength and standability, predisposing the crop to lodging.

Some have asked whether it is possible to estimate expected yield loss in the field. This is a difficult task, since many factors affect yield loss due to gray leaf spot: timing of the disease, stage of crop development, susceptibility of the hybrid, distribution of symptoms on the plant, ability of the hybrid to partition stored reserves from the stalk, other pests and environmental stresses, and so on. Nevertheless, there is value in having some guidelines for estimating potential yield loss. Based on field work conducted in a variety of locations including Kentucky, the following is offered as a rough guideline for estimating potential yield loss at the dent stage (Table 1).

Table 1. A set of tentative guidelines for estimating yield loss due to gray leaf spot at the dent stage.

% blighted tissue on the ear leaf at dent	Range of expected yield loss
5% or less	0 to 2% yield loss
6 - 25%	1 to 10% yield loss
Over 25%	Loss of at least 10% is likely, with more possible depending on severity and timing of symptoms. Yield losses of over 70% are possible in the worst outbreaks, although losses of this level are uncommon in Kentucky.

Dr. Don Scott from Purdue University has also developed tentative guidelines for estimating potential yield loss from gray leaf spot in corn. These guidelines are provided below (Table 2), and may also be useful to producers and others concerned about the impact of this disease. Please note that these guidelines are tentative, and are subject to modification as more research is conducted on gray leaf spot.

Table 2. A set of tentative guidelines for estimating yield loss due to gray leaf spot over a range of crop development stages.

Crop stage at which several to numerous lesions occur on all leaves	Yield reduction expected
Milk stage	Approximately 30%
Early dough stage	Approximately 15%
Mid-dough stage	Approximately 7-10%
Hard dough stage	Approximately 2-5%

Reviews of previous versions of this document were kindly provided by Dr. Eric Stromberg at Virginia Polytechnic Institute and State University, Dr. Pat Lipps at the Ohio State University, and Dr. Don Scott at Purdue University.

13 Aug 01

SOYBEAN

SOYBEAN APHID BECOMING MORE COMMON IN KENTUCKY. KEEP YOUR EYES OPEN!
by Doug Johnson

The soybean aphid has not been too hard to find during our limited survey of Kentucky fields. It is likely that the insect can be found most anywhere in the state where soybeans are grown. In most cases, the numbers of aphids per leaf have been very small but we are beginning to find some populations that are obviously increasing. In one case, the population was quite large with some plants having up to 100 aphids per leaf. It is still too early to know if the aphid will affect yields but it is time to check fields to see if the insect is present. In my opinion, the greatest potential for problems will be on the late-maturing varieties; however, we have no history to call upon to help us understand this pest.

We are faced with three big questions- What

should be used as a "threshold" to determine the need for treatment? How do we measure that threshold? and What should be done if we reach the threshold?

In the more northern states, many soybean aphid populations have been kept in check by natural enemies, most commonly lady beetles. However, other general aphid predators, parasites and fungal diseases are common in heavy infested fields. If these "good guys" are not able to keep the population in check, an insecticide application may be needed.

When does one need to make an insecticide application? The complete answer to this question will require considerably more research. However, Dr Christina DiFonzo of Michigan State University, and other colleagues in states to our north, have seen fields with much larger and earlier aphid populations, and have been working on this question. The following suggestions for making a pesticide application come from Dr. Chris DiFonzo of Michigan State University. (See http://www.msue.msu.edu/ipm/CAT01_field/FC07-26-01.htm)

- 1,000 or more aphids per plant are needed to justify treatment. This means that aphids are covering leaves **and** stems and that honeydew and sooty mold are visible on leaves
- Dry conditions (plants water-stressed)
- Pathogenic fungus not observed killing aphids

In Dr. DiFonzo's opinion, fields not exhibiting these characteristics and that also harbor numerous natural enemies, do not need a treatment. If you do treat, leave unsprayed strips as a refuge for beneficial insects and to check yield at harvest. This is very good advice from Chris. Until considerably more research is available on this insect, the only way you will be able to judge if your application is doing any good is to leave an unsprayed test strip.

How should we estimate aphid populations? Since you are really only interested in very large populations, a procedure being used in Michigan to evaluate plots might be a good method. It is relatively quick and simple, since it requires little counting. The scale rates populations on the middle leaflet from fully expanded trifoliate leaves from the middle part of the plant canopy as follows -
0 = no aphids; 1 = 1-10 SBA / leaflet; 2 = 11 — 25 SBA / leaflet; 3 = 26-100 SBA / leaflet;
and 4 = 100 or more aphids per leaflet.

If you find leaves rated in the 3 to 4 range, you should examine the entire plant. If you find a plant with a leaflet containing more that 100 aphids it will not take you long to find out if the plant has more than a thousand aphids per plant. As with all scouting procedures, you should examine plants at several different locations within the field. I would suggest that you examine no fewer than five plants at each of five locations.

If you judge that your field has a large enough population to warrant an application, what do you use? This is a really tricky question, with two major considerations. First what is legal to use and second what is best to use.

The Current Situation.

- There are currently no insecticides labeled (Federal Section 3) for use on soybean that list soybean aphid as a target pest.

- There are eight insecticides that are registered (Federal Section 3) for use on soybean which have aphids listed as a target pest on some other crop See Table 1.

- It is my understanding that application of an insecticide which holds a Section 3 federal label on a site (e.g. soybean) is a legal application for any rate up to the maximum rate listed on that label for that site. However, the company does not carry any liability for control for a pest that is not listed on the label.

- A company can issue a section "2ee label extension" if they wish to make a claim of control for a pest on a crop for which they already have a label. Thus far, only FMC for Furadan 4F makes such a claim. However, to the best of my knowledge this has not yet been done in Kentucky. You must have a copy of this 2ee label extension in you procession for it to be in force.

Table 1. Insecticides labeled for use on soybean that are also labeled for use against aphids on some other crop. These products DO NOT carry a claim for soybean aphid.

Insecticide	Manufacturer	Chemical Class	Waiting Days to Harvest
*Ambush 2E	Syngenta	Synthetic Pyrethroid	60
*Asana XL	DuPont	Synthetic Pyrethroid	21
dimethoate	various suppliers	Organophosphate	21
Lorsban 4E	Dow	Organophosphate	28
*Furadan 4F	FMC	Carbamate	21
*Penncap-M	Cerexagri	Organophosphate	20
*Pounce 3.2 EC	FMC	Synthetic Pyrethroid	60
*Warrior T	Syngenta	Synthetic Pyrethroid	45

* Restricted Use Pesticide

It appears from insecticide trials done in states to the north that all the insecticides will reduce the number of aphids. However, it appears that the older organophosphate insecticides are doing a little better job than the new synthetic pyrethroids.

It is critically important that you do not make an application unless you really need it. This aphid has an incredible reproductive capacity. Once an insecticide application is made, most all the natural control agents will be killed. The soybean aphid appears to have a much greater potential for "rebounding" than any pest we have faced in Kentucky.

If you would like to keep up with the information that is being generated on this aphid please view the following web page:
http://www.pmcenters.org/Northcentral/Saphid/Aphidindex.htm

You can view a nice fact sheet put together by our working group at:
http://ipm.uiuc.edu/publications/20425.pdf

FRUIT CROPS

PIERCE'S DISEASE OF GRAPES AND BACTERIAL LEAF SCORCH
by John Hartman

Symptoms of bacterial leaf scorch are now appearing on shade and landscape trees (mainly oaks) in Kentucky. Leaf scorching symptoms associated with this disease have regularly appeared in early August for many years. Symptoms being seen now are quite striking on pin and red oaks with individual leaves turning 1/3 to 2/3 brown on the leaf ends and margins. The causal agent of bacterial leaf scorch is a leafhopper-vectored bacterium called *Xylella fastidiosa.*

Another strain of *Xylella fastidiosa* causes a similar leaf scorching disease of grapes called Pierce's disease. This disease is favored by the hot weather found in the southeastern U.S. Although Pierce's disease has not yet been reported from Kentucky, it is present in some other southern states. The fact that bacterial leaf scorch can be so devastating to landscape trees here suggests that if the *Xylella* causing Pierce's disease were present in Kentucky, it would thrive.

Symptoms of Pierce's Disease. Symptoms vary with the different species and cultivars. Symptoms in spring and early summer include delayed shoot growth, leaf mottling, and dwarfing of new shoots. Late summer and fall symptoms are more dramatic and include burning, scorching, or drying of leaves; wilting or premature coloring of fruit; and uneven cane maturity. Scorching begins near the margin of the leaf blade where tissues become completely desiccated and die. As summer progresses into fall, scorching progressively spreads inward in concentric zones until the entire leaf blade is

affected. Leaves often fall from the vine at the point of attachment to the petiole, leaving the petiole still attached to the shoot.

The disease progresses along the grape vine with symptoms developing in adjacent leaves along the shoot both above and below the point of initial infection. Flower clusters on infected vines usually dry up. Late in the season, wood on affected canes fails to mature normally, leaving green "islands" of tissue which persist into the dormant season and can be seen on canes throughout the winter. Tips of shoots often die the first year the vine is infected. Initially, only one or a few canes on a vine show foliar and wood symptoms. Symptoms are more pronounced in vines that are stressed by high temperatures and drought conditions.

Grape susceptibility and disease spread. Some grape cultivars are very susceptible, usually dying within two years. Most French (vinifera) varieties die within two to five years while American (labrusca) varieties often live longer than five years. Pierce's disease is spread by several types of sharpshooter leafhoppers, by spittlebugs, and by grafting. As far as is known, the grape pathogen is the same as, but not identical to the tree leaf scorch pathogen. Thus, the disease would not be spread from trees to grapes. There is no effective control known for this disease.

With an emerging grape industry developing in Kentucky, it is important that growers and County Extension Agents be on the lookout for this disease. Personnel in the U.K. Plant Disease Diagnostic Laboratory can run specialized tests to determine the presence of the Pierce's disease bacterium as well as the strains from landscape trees.

DIAGNOSTIC LAB HIGHLIGHTS

by Julie Beale and Paul Bachi

Samples in the Diagnostic Lab this past week included gray leaf spot (Pyricularia) on millet; soybean cyst nematode and sudden death syndrome on soybean; bacterial soft rot / hollow stalk, black shank, soreshin, Fusarium wilt, blue mold, frogeye and alfalfa mosaic virus on tobacco.

On fruit and vegetable samples, we diagnosed crown gall on grape; Phytophthora blight on ginseng; tomato spotted wilt virus and sunscald injury on pepper; scab on potato; Microdochium blight, manganese toxicity and the potyvirus complex on pumpkin; and anthracnose, early blight, Botrytis canker, Septoria leaf spot, Fusarium wilt, root knot nematode, and blossom end rot on tomato.

On ornamentals, we saw Aureobasidium leaf blight on daylily; Rhizoctonia root / stem rot on delphinium, impatiens, petunia, and scabiosa; gray leaf spot on perennial ryegrass; brown patch on tall fescue; Pseudonectria (Volutella) dieback on boxwood; anthracnose (Kabatiella) and Marssonina leaf spot on maple; tar spot and powdery mildew on tuliptree; and Verticillium wilt on smoketree.

INSECT TRAP COUNTS

UKREC, Princeton, August 3 - 10, 2001

True armyworm	11
Fall armyworm	6
Beet armyworm	0
Corn earworm	18
European corn borer	7
Southwestern corn borer	37

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.