



# KENTUCKY PEST NEWS

ENTOMOLOGY • PLANT PATHOLOGY • AGRONOMY

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### TRAINING WORKSHOPS & SEMINARS:

**IPM & Fumigation Workshop** for Food Processors, Grain & Milling Industry Fumigators. August 11, 1998. Evansville, IN. For further information contact Ms. Della Simmons, (800)467-5530. Kentucky CCH Categories 1C, 7A, 7C, 8, 10. Registration fee.

## TOBACCO

### CURRENT BLUE MOLD STATUS

By William Nesmith

Since June 23, weather favorable for blue mold development has generally not been present in Kentucky, except for June 29 and 30 when a strong weather system moved through, dropping heavy rain in some communities. Even with all that moisture, most areas escaped significant risk of a newly developing epidemic, because the preceding hot, dry weather had greatly reduced the ability of the fungus to sporulate immediately. Therefore, only a moderate-level risk existed through the July 4th holiday period. The weather forecast for most of the coming week should not support much activity.

Rapidly developing tobacco tissues will continue to be highly susceptible to infection. However, in most

communities, the leaves are not wet long enough in the cooler parts of the night for much infection to be taking place. The cooler temperatures experienced late last week should have allowed some established blue mold colonies to regrow, but night temperatures were high enough most nights in areas with the strongest disease to slow development. Northern counties and fields near hills and heavy woods could have experienced much cooler temperatures, and therefore, have experienced more blue mold activity.

It takes live spores to beget new blue mold! The key limiting factor is low spore levels, resulting from the hot weather of late June. Lesions that experienced the high temperatures have demonstrated very little or no ability to re-sporulate even when returned to ideal conditions. County Extension Agents statewide reported very little new sporulation, late last week. Until new spores develop, a key driving factor is missing, regardless of how favorable the weather or the susceptibility of the plant.

Some expansion of old lesions was observed late last week, especially where lesions involved larger veins. The fungus probably was able to remain alive, buffered in these veins. Agents need to check such areas closely for new sporulation, as well as from new growth in systemically infected plants. These are the most likely sources of new spores. A key regulating event for future outbreaks will be

when and how much sporulation occurs. So appreciate the following: Although blue mold activity subsided greatly with the hot weather of late June, it has the ability to recover with cool, moist nights. Also, the blue mold fungus can remain viable in tissues of systemic infections, especially veins and mid ribs. Shady areas along edges of fields, bottoms adjacent to hills/knobs, or lower leaves in heavy canopy could serve as inoculum-producing sites in any community. It is very important that we remain aware of developments statewide. County agents need to keep their communities and me posted on new sporulation events for the remainder of the season.

Northern and eastern counties, though having less blue mold, could be the key staging areas, because they experienced fewer hours per day at the high temperatures. Systemically-infected transplants are also potential staging sites, and they have been moved statewide in recent weeks - even to areas not reporting blue mold. Growers (especially those in eastern and southeastern Ky) need to also remain alert to changing blue mold situations in the southern Appalachian area, where cooler day temperatures have prevailed. This source could quickly threaten with changing weather patterns.

**CONTROL RECOMMENDATIONS:** Do not abandon controls, but the vigor can be reduced until sporulating sources are present or threaten the community. Fields should be scouted very carefully for evidence of newly developing lesions, expansion of older lesions, and new sporulation from either. If active disease is present in the community, crops should continue to be sprayed weekly with foliar fungicides. Acrobat MZ is the superior product.

For growers with adequate spray equipment in counties with blue mold this season, fungicide sprays should be maintained until no sporulation or new lesion development/ expansion has been observed for 10-14 days. Afterwards, the spray interval can be extended from 5-7 days to 10-14 days as long as low-level blue mold potential exists. Immediately return to weekly intervals, once the sporulating sources are identified or should watches or warnings be posted for the area.

In counties without a blue mold history this season, sprays are not needed currently until sporulating sources are threatening and favorable weather exists. However, application intervals of 10-14 days should provide good insurance for growers preferring some protection.

If a farmer has less than good spray equipment, sustaining a spray program at 7-10 day intervals is justifiable regardless of the location. Burley tobacco is highly susceptible to blue mold development during this period of rapid growth, especially those crops between layby and topping, and poor spray equipment performs best when the disease pressure is low, but is very inadequate when the disease potential is high. Sustaining the spray program now may help to delay the disease, especially if major inoculum does not come from outside the planting.

Any transplant not needed should be destroyed immediately. Abandoned transplant sites will serve as staging areas for blue mold to be harbored during periods when it is too dry or sunny for the disease to operate in the field. Be a good neighbor and destroy abandoned plant beds/transplants.

It should be assumed that blue mold remains active at some level in all counties listed with activity in last week's Kentucky Pest News. Only one additional county was added, Owsley County in the Quicksand Area, which involved systemic blue mold that had been present for several weeks.

## **BUDWORMS** **by Lee Townsend**

Budworms can cause serious damage to tobacco at this time of the season. Their eggs are laid singly on the underside of the leaves at the top of the plant. The larvae feed for 3 to 4 weeks and are about 1.5" long when full grown. Feeding is generally confined to the bud area and the small larvae and early signs of feeding damage are often undetected. Feeding holes enlarge and become obvious as the leaf continues to expand. The larvae are usually very large by this time and most of the feeding damage has been done.

Examine the bud area of tobacco plants at weekly intervals for small feeding holes on the bud leaves and the small black insect droppings (look like ground black pepper) that collect on the leaves. Budworm control can be accomplished by properly timed sprays, when there are 5 or more larvae per 50 plants. (See ENT-15 for recommendations)

## **JAPANESE BEETLES AND TOBACCO** **by Lee Townsend**

While they don't make the "Top 5 Pests" list for the crop, Japanese beetles are not strangers to tobacco

fields. Often, they may be seen sitting and “sunning” on plants without feeding. Presumably, many of these have just emerged from the soil in the field and are resting prior to moving off in search of food. Occasionally, they will feed on a plant and will attract other beetles to join them.

Tobacco plants attacked by many Japanese beetles may be severely skeletonized with the remaining tissue turning brown. These plants look much worse than those with smooth-edged holes caused by a hornworm, at least what is left behind by the hornworm generally looks better.

Sevin is the only insecticide with Japanese beetle on the label as a tobacco pest. The beetle is on Orthene labels for ornamental plants but not on the tobacco label because, so far, it has remained a very minor pest. Orthene should be effective against this insect if a treatment is necessary.

### **SOLARIZATION OF TOBACCO GREENHOUSES CAN AID DISEASE CONTROL**

**By William Nesmith**

Solarization during the midsummer and early fall has long been practiced in the greenhouse industry as an aid to disease control. However, this valuable disease control method has been lost with most modern greenhouse operations due to the tendencies toward year-round production and the use of heat sensitive items in the construction. Few tobacco farmers are using this control method, yet their operations are well situated to benefit, because the houses are not operational during the hottest part of the season.

Closing up the greenhouse completely during hot sunny periods will cause temperatures to reach 120 to 150 F for several hours a day. The resting stages of many pathogens (but not all) can be killed at such temperatures with sufficient time. The longer the exposure time the greater the kill. Significant control has been achieved with as little as one week when temperatures reached 140 F for four hours or more each day, for seven consecutive days. However, if the operation will only be closed up for a week, be sure to use a thermometer inside the greenhouse to insure the temperatures are reaching 140 F for four hours or more daily. During the solarization period, the materials should be kept moist to improve kill. Do not expect kill deep inside objects. Soils will be penetrated about 0.5 inch.

Some materials in the greenhouse may be sensitive to high temperatures during solarization, so growers should check with suppliers to determine what items would be heat-sensitive and damaged by solarization. We have observed serious damage to some heat-sensitive items not suggested/approved for greenhouse construction or use.

A good sanitation program should be coupled with solarization, otherwise the house will be recontaminated quickly. A general clean up should proceed the solarization, eliminating all materials not scheduled for reuse, and all items reintroduced should be sanitized prior to placing them back into the house.

### **ANGULAR LEAF SPOT IN THE FIELD** **By William Nesmith**

Angular leaf spot is primarily a plant bed disease in Kentucky, but it also occurs in nearly every field to some degree and seldom causes serious damage. However, it does occasionally cause significant damage in the field to both burley and dark tobaccos, mainly during prolonged wet periods with heavy storms. Last week was one of those periods of high activity in the field, reaching epidemic levels in some sites. The weather patterns this season have favored build up and development. Angular leaf spot could increase rapidly and cause economic crop damage until a drier weather period prevails.

What favors development? During wet seasons, the bacterium causing angular leaf spot colonizes the leaf surface, moving from leaf to leaf by rain splash. When the population of the angular leaf spot bacterium is high, the potential for damage is great. If dry weather prevails, this event does not happen and is reduced greatly by even short periods of leaf drying. Furthermore, as long as the bacterium remains on the leaf surface little disease develops, but once inside, disease results. Water-soaking of the leaf tissue is the key factor in introducing the bacterium inside the leaf. Driving rains in the early morning hours or later on cloudy days are usually responsible for serious angular leaf spot outbreaks in the field. In addition, plants low in potassium and high in nitrogen are damaged more by the disease than plants properly fertilized.

During periods prone to serious angular leaf spot problems, we release special advisories - such as

this one. It is normally not necessary to make applications of pesticides for the control of angular leaf spot in the field in Kentucky. When it is warranted, streptomycin (0.5 to 1.0 lb/100 gallon per acre) is the product of choice. The objective is to cover the leaf in order to reduce the bacterial population on the leaf. Repeated applications are required and good spray coverage is essential. Best results will occur if the material is applied to achieve complete coverage of the leaf and under conditions of slow drying, such as late in the day. High rates of streptomycin are toxic to tobacco, so follow labeled rates closely. The first spray should be made at the higher rate of 200 ppm (1.0 lb/ 100 gallons) and the preventive rate is 100 ppm. The curative rate is usually necessary if the disease is well established before sprays begin.

A new wrinkle in the angular leaf spot situation is the concern that new strains of it or related bacteria may be appearing. In particular, we remain watchful in the commercial transplant industry. Should angular leaf spot-like disease develop in plants obtained from out-of-state sources, samples should be sent to the Diagnostic Lab for confirmation. Recall that one such issue surfaced this spring, but we have not seen evidence of it in the field, so far this year. We need to be very watchful for new strains of wildfire for which current burley and dark varieties are not resistant.

Some communities have had difficulty finding adequate supplies of streptomycin, apparently due to a distribution problem. There is not an alternative pesticide.

## **SHADE TREES AND ORNAMENTALS**

### **DYING MAPLES IN THE LANDSCAPE**

**By John Hartman**

We are receiving laboratory specimens and getting numerous reports of maple trees or parts of trees dying in landscapes throughout Kentucky. The problem most often involves well-established sugar maples. Homeowners usually report a sudden wilting and death of their trees; in some cases this is true, but in others, twig growth and tree ring analysis suggest that some of the dying maple trees have not been growing well for some years.

There does not seem to be a single cause for the decline and death of landscape maples this year. We have observed a number of factors that have

caused death or triggered decline and death of maples, including:

\* Verticillium wilt. Often developing on one side of the tree first, branches progressively wilt and die throughout the tree during the growing season. Where infections occurred late in the previous season, trees may not have even leafed-out this year, or if they did, they immediately died. Mild winter temperatures may have allowed this soil-borne fungus to be more active than usual, but we also saw considerable activity from this disease last summer.

\* Girdling roots. Offending roots may not be visible above ground, but if the tree trunk does not have the normal buttress root flare at the base, and instead, goes straight into the ground like a telephone pole, self-girdling roots should be suspected. Trees with girdling roots may decline over a period of years, but then may collapse suddenly.

\* Canker and collar rot. We have diagnosed some cases of *Phytophthora* bleeding canker and collar rot on maples this year. Water-soaked bark spots have been observed on trunks of affected trees. Collar rot, causing bark decay and wood staining, if well developed, can cause death of the top of the tree. Usually, collar rots and bleeding cankers lead to gradual decline of infected trees. The fungus *Phytophthora* is favored by high soil moisture levels, especially temporary flooding.

\* Restricted rooting space. Sugar maples planted as street trees sometimes lack space for their roots to exploit. Such trees with inadequate root systems would be especially vulnerable to drought and temporary flooding stresses.

\* Soil compaction from foot traffic, construction, or other activities crushes small roots and makes soils impervious to invasion by new roots. Affected maples may decline.

\* De-icing salts. Sidewalk and road salt were not used much this past winter, but where they were used and where treated snow is piled over the root system, accumulations could reach levels injurious to maples which are fairly sensitive to excess soil salts.

\* Mechanical injuries. Construction, such as laying utilities, severs roots and triggers decline. Wounds to the trunk or large branches can also have

negative effects on maple tree health.

\* Opportunistic fungi. Root, butt, and trunk rotters such as *Ganoderma lucidum* are found on some declining trees. In addition, canker and canker-rot fungi such as *Botryosphaeria obtusa*, *Nectria cinnabarina*, *Cerrena unicolor*, and *Stegonosporium pyriforme* are capable of invading weakened plants and causing branch dieback.

Although some infectious diseases are involved in the current wave of maple declines and death, much of the problem lies with urban stresses. In addition, recent hot weather, wet spring conditions, mild winter temperatures, drought last summer, and any number of weather extremes from several years ago could be involved. In almost all cases, there is no reversing the decline. For those with still-healthy maples, continue to provide good growing conditions and be observant for the first indications of maple distress such as premature fall color, branch tip dieback, and girdling roots.

## HOUSEHOLD

### WET-WEATHER PESTS INVADING BUILDINGS

By Mike Potter

Wet conditions have led to many calls from clients, complaining about pests invading their homes and businesses. The most common culprits have been sowbugs, pillbugs and millipedes.

All three pests live in moist environments outdoors but occasionally end up in buildings. While they sometimes enter in large numbers, they do not bite, sting, or transmit diseases, nor do they infest food, clothing or wood. They are simply a nuisance by their presence.

#### Recognition and Habits

Sowbugs and pillbugs are similar-looking pests which are more closely akin to shrimp and crayfish than to insects. They range in size from 1/4 to 1/2 inches long and are dark to slate gray. Their oval, segmented bodies are convex above but flat or hollow underneath. They possess seven pairs of legs and two pairs of antennae (only one pair of antennae are readily visible). Sowbugs have two tail-like appendages which project out from the rear end of the body. Pillbugs have no posterior appendages and can roll up into a tight ball when disturbed, for which they are sometimes called "roly-polies." Millipedes, also known as thousand-leggers, are brownish, wormlike and segmented. Each body segment has two pairs of very short legs.

Millipedes that commonly invade homes are about 1/2- 1 inches long and tend to coil up like a watch spring when disturbed.

In nature these critters are scavengers and feed mainly on decaying organic matter. They occasionally feed on young plants but the damage inflicted is seldom significant. Sowbugs, pillbugs and millipedes thrive only in areas of high moisture, and tend to remain hidden under objects during the day. Around buildings they are common under mulch, leaf litter, compost, boards, stones, flower pots, and other items resting on damp ground. Another frequent hiding place is behind the grass edge adjoining sidewalks and foundations.

Sowbugs, pillbugs and millipedes may leave their natural habitats at night and crawl about over sidewalks, patios, and foundations. They often invade crawl spaces, damp basements and first floors of houses at ground level. Common points of entry include door thresholds (especially at the base of sliding glass doors), expansion joints, and through the voids of concrete block walls. Frequent sightings of these pests indoors usually means there are large numbers breeding on the outside, close to the foundation. Because of their moisture requirement, they do not survive indoors more than a few days unless there are very moist or damp conditions.

#### Management Options

*Minimize Moisture, Remove Debris* - Recent complaints about these pests can be attributed to the excessively wet weather. Patience and drier conditions will correct much of the problem throughout Kentucky. Nonetheless the most effective, long-term measure for reducing indoor entry of these and many other pests is to minimize moisture and hiding places near the foundation. Leaves, grass clippings, heavy accumulations of mulch, boards, stones, boxes, and similar items laying on the ground beside the foundation should be removed, since these often attract and harbor pests. Items that cannot be removed should be elevated off the ground.

Don't allow water to accumulate near the foundation or in the crawl space. Water should be diverted away from the foundation wall with properly functioning gutters, down spouts and splash blocks. Leaking faucets, water pipes and air conditioning units should be repaired, and lawn sprinklers should be adjusted to minimize puddling. Homes with poor drainage may need to have tiles or drains installed, or the ground sloped

to so that surface water drains away from the building. Humidity in crawl spaces and basements should be reduced by providing adequate ventilation, sump pumps, polyethylene soil covers, etc.

*Seal Pest Entry Points* - Seal cracks and openings in the outside foundation wall, and around the bottoms of doors and basement windows. Install tight-fitting door sweeps or thresholds at the base of all exterior entry doors, and apply caulk along the bottom outside edge and sides of door thresholds. Seal expansion joints where outdoor patios, sunrooms and sidewalks abut the foundation. Expansion joints and gaps should also be sealed along the bottom of basement walls on the interior, to reduce entry of pests and moisture from outdoors.

*Insecticides* - Application of insecticides along baseboards and other interior living areas of the home are of little use in controlling sowbugs, pillbugs and millipedes. Most of the critters which end up in kitchens, living rooms, etc. soon die from a lack of moisture. Removal with a broom or vacuum is all that is needed. Insecticides may help to reduce inward invasion of these and other pests when applied outdoors, along the bottom of exterior doors, around crawl space entrances, foundation vents and utility openings, and up underneath siding. It may also be useful to treat along the ground beside the foundation in mulch beds and ornamental plantings, and a few feet up the base of the foundation wall. Heavy accumulations of mulch and leaf litter should first be raked back to expose pests for treatment. Insecticide treatment may likewise be warranted along foundation walls in damp crawl spaces and unfinished basements.

Various insecticides sold in hardware/lawn and garden shops are effective, including Sevin, Dursban, and permethrin (Spectracide Bug Stop). Treatment can be accomplished with a compressed air pump up or hose end sprayer.

## DIAGNOSTIC LAB-HIGHLIGHTS

By Julie Beale and Paul Bachi

This was a very busy week in both diagnostic laboratories--typical for this time of year. Note that Rhizoctonia diseases are prevalent-- in field crops, landscape plantings and home gardens.

Fusarium crown rot of alfalfa and Rhizoctonia stem rot of soybean were diagnosed. On tobacco, a wide range of infectious, as well as non-infectious problems are being seen: angular leaf spot, black

shank, soreshin (plus the combination of black shank and soreshin), blue mold, frog-eye leaf spot, target spot, nutritional problems and root problems resulting from transplant shock/hostile root environment.

Many diseases are being to appear in the landscape, especially as temperatures rise. Southern stem blight was diagnosed on hosta; Rhizoctonia stem rot on Oriental lily and petunia; powdery mildew on phlox; and bud blast (physiological) on peony. On turfgrass, we saw several cases of brown patch on fescue, as well as the first case of gray leaf spot (Pyricularia) this year on perennial rye (unusually early). On woody ornamentals Cryptodiaporthe canker was diagnosed on willow and pine wilt nematode was diagnosed on Scots pine. Powdery mildew is now beginning to be apparent on dogwoods.

Fruit diseases found this week included black rot and anthracnose on grape; the black root rot complex on strawberry; bacterial canker and powdery mildew on cherry; scab on peach; and cedar-apple rust on apple.

On vegetables, we are seeing Septoria leaf spot, early blight and Rhizoctonia stem rot on tomato. Rhizoctonia stem rot is also common on beans at this time. Bacterial diseases on vegetables have also been common, including black rot on cabbage and collards; bacterial crown rot (Erwinia) on rhubarb; and Erwinia top and stalk rots on sweet corn.

## INSECT TRAP COUNTS PRINCETON JUNE 26 - JULY 2

Corn Earworm .....	0
European Corn Borer .....	0
Southwestern Corn Borer .....	15
Fall Armyworm .....	0

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Lee Townsend, Extension Entomologist