Tobacco is plagued by a number of leaf spotting diseases other than blue mold, and these are often confused with blue mold, which can cause errors in late season management. Such is happening this year and the “other” diseases are now causing much more damage than blue mold. Moreover, because very different factors related to plant development drive these “other” diseases, late season management is very different for fields with them than for handling blue mold fields. Basically, the blue mold epidemic is over, except for very late tobacco that has yet to be topped, but these “other” leaf spots are developing rapidly.

Late season management of crops with these “other” diseases is very different than management of blue mold. Why, because blue mold prefers young tissues while most of the others prefer the more mature or injured tissues. Consequently, as the plant ages, the potential for these other leaf spots increases at an increasing rate, while blue mold potential declines rapidly. With blue mold, it is recommended that the crop remain standing to recover yield, while with these other diseases timely harvesting is critical to preserving yield, as these plants also have a reduced potential to increase their yield if wet weather persists.

Blue mold gets most of the attention, because it attacks young, healthy tissues and is the most damaging, overall, but these other leaf spotting/blighting diseases are also important, especially in mature tobacco during damp weather. These other leaf spotting diseases occur every year, but they are worse in seasons when the roots have been damaged by something, (this year heavy rains have damaged roots in many areas) followed by long periods of humid weather -“dog days. These other diseases can build rapidly if wet weather persist after the leaves begin to mature, because they move up into the mid-stalk and upper leaves. Since that is what has happened this year, the leaf

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TOBACCO

OTHER FUNGAL LEAF SPOTTING DISEASES OF TOBACCO
By William Nesmith

Tobacco is plagued by a number of leaf spotting diseases other than blue mold, and these are often confused with blue mold, which can cause errors in late season management. Such is happening this year and the “other” diseases are now causing much more damage than blue mold. Moreover, because very different factors related to plant development drive these “other” diseases, late season management is very different for fields with them than for handling blue mold fields. Basically, the blue mold epidemic is over, except for very late tobacco that has yet to be topped, but these “other” leaf spots are developing rapidly.

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CORN

• Reminders about selected ear and kernel rots
• Evaluate corn for borers now

SOYBEANS

• Green cloverworm: the second generation
• Soybean aphids continue to become more common
• Apple fruit diseases can be devastating
spotting diseases are building fast, and great damage could occur if harvest is not timely. Fields with such leaf spots should not be left standing long after the sucker-control preharvest interval has been met.

These other diseases are present to some degree in most fields, but the importance of each disease in the mix varies greatly from site to site. These diseases are especially serious in non-rotated fields with root diseases, especially those located below about 700 ft above sea level in river or creek bottoms. Many of these same fields were hit by blue mold, target spot, and/or bacterial soft rot earlier while the tissues were younger. Areas that received the heavy rains a few weeks ago are especially at risk.

Brown spot, frogeye, and ragged leaf spot are all very active now and escalating rapidly as the crop ages. Fields of lush growing tobacco continue to have active blue mold, target spot, and bacterial soft rot, however, but most fields are past the stage where the diseases of young, succulent leaves are present. Most areas of the state are experiencing one or more of these “other” leaf spotting diseases of the mature, over-mature, or weakened leaves. These “other” diseases could cause significant crop damage if harvesting is not timely, because unlike blue mold which declines with plant maturity, these other diseases are favored by maturity. In some fields, at least 25% of the leaf surface has already been destroyed by blue mold, bacterial soft rot, and these other leaf spots. Consequently, harvesting decisions are critical. Fungicides are not labeled for these diseases, and if they were, applying them in topped tobacco into the lower leaves where it would be needed would be very difficult.

Below is a brief review of the “other” major diseases involved:

**Brown Spot** is caused by the fungus *Alternaria alternata*, is worse in hot, wet seasons and can cause extensive damage in stressed plants experiencing frequent moisture late in the season. In Kentucky, it is present all the time to a limited degree, but develops very rapid with “dog-days” weather of late summer in over-mature crops and root-stressed crops. This year, it has been especially active in early set crops that have been left standing and allowed to become over-ripe. Crops with poor sucker control and those with full flower heads are also at greater risk, because these deplete leaf reserves. Lesions start as small, dark colored water-soaked spots that round-up and become brown with concentric rings in time, often surrounded by a yellow halo. Once present in the crop, the disease progresses up the plant and continues at an increasing rate during periods of high humidity. It also attacks the veins and midribs.

In addition to leaf spotting, it is associated with premature leaf defoliation, the result of inducing an abscission layer between the stem and leaf. Consequently, leaf drop can be high during harvesting and handling. This fungus is carried over between seasons on crop debris, leaves and stalks from the previous season, and is usually worse in non-rotated crops so rotation is a recommended control. The following factors also favor brown spot development: Maturity of the plant or practices that delay harvesting of mature plants; root stress, such as black root rot, tobacco stunt, flooded soils, nematodes, etc.; splashing rains, especially those that splash mud onto the leaves - which is carrying the spores; and, delayed nitrogen availability enhances the disease in seasons when strong activity is occurring.

**Ragged-Leaf Spot** is cause by *Ascochyta nicotiana* and severe cases can trash the older leaves. It is favored by cool, wet weather and often found following blue mold epidemics if the cool weather persists. Consequently, the hot weather of late July and early August checked its development, up the stalk, but it will return with the cooler nights. Lesions are irregularly circular spots with concentric rings of ashy-gray to brown centers, that usually fall out giving the lesions a very ragged appearance. If halos are present, they are usually very small, but sometimes the lesion develop down small veinlets on one side of the lesions. A few scattered black flecks (fungal fruiting bodies) may be present as the lesion ages, but cool conditions are required for this sign to develop and it often is not present. Ragged-leaf spot is often associated with blue mold, frequently invading small blue mold lesions and expanding them, during prolonged cool weather. We usually see this as a fall disease in Kentucky, but this year it established on the blue mold lesions with the cool weather in June and early July, but has slowed with the heat. Where Acrobat MZ was used well for blue mold control, this disease was also controlled.
Frogeye, caused by the fungus, Cercospora nicotianae, is very common and at damaging levels in many fields. It has exploded in central and western Kentucky. Like blue mold, it too requires free water on the leaf for infection, with symptoms within one to four weeks, depending on temperatures. The disease is highly weather dependent, worse during periods of hot, humid weather with multiple rain events. Initially, the lesions are small fleck to pencil diameter, then they expand. Lesion expansion is highly dependant upon light - with small lesions in an abundance of light vs large lesions in lower light situation. The hotter weather, the faster the symptoms develop.

This is a weak parasite, and mainly attacks plants that are physiologically declining, especially those with late season root disorders. Consequently, almost anything that upsets the plant’s physiology and causes premature aging of the leaf can favor this disease during hot, humid weather. At the same time, the fungus appears to be worse on plants that have had adequate to excess nitrogen prior to the physiological disturbance - suggesting leaves that have high total N are better hosts.

The disease occurs as a leaf spot while plants are in the field, but development can continue during the curing process resulting in green spots on the cured leaves. The disease works its way up the plant, starting on the lowest leaves near the soil, because older or senescing leaves are more susceptible. The lesions on field plants occur mainly as circular spots with orange halos with the dead area papery thin and usually white. In the center of each lesion is a gray to black mass, which is the reproductive parts of the fungus causing the disease. The disease is mainly associated with the lower leaves, but as affected plants approach harvest, the disease can flash up the stalk during humid weather causing significant leaf damage from “trashing” of the leaf. This usually does not happen until topping has occurred and the top leaves have been stressed. Infections that occur before harvest, but that have not developed into lesions by harvest, can result in green spotting of cured leaf. This green results from the fact that toxins in the fungus have fixed the chlorophyll preventing normal chlorophyll degradation during curing.

A long wet period is required for infection, but the length of the infection periods is reduced as temperatures rise. Symptom appearance is also very temperature dependent, requiring two to three weeks during cool weather but a week during hot, humid weather.

The following conditions favor frogeye development by either favoring fungal development or predisposing the leaf to infection: Prolonged leaf wetness is needed for infections, so the following should favor frogeye - high plant populations, dense plant canopy, bottom-land sites, night-time irrigation, and fog pockets in the field. High populations of the fungus building on lower leaves increase severity to upper and mid stalk leaves, especially if harvesting is delayed until the plants become thoroughly ripe. Senescing or aging tissues are more susceptible to infection than are young tissues. Therefore, growing or cultural conditions that cause premature ripening or aging of leaves should favor the disease. Conditions where physiological imbalances suddenly occur, such as breaking drought with heavy rains and excessive absorption of sucker controls appear to favor development. High nitrogen fertilization has long been known to favor frogeye. Allowing crops to become over-mature in the field when infections are already active, good fertility, and heavy rains that damage root systems can lead to a serious problem with frogeye. Consequently, timing harvest for fields with active frogeye should be considered carefully, considering the above factors of predisposition.

CORN

REMINDERS ABOUT SELECTED EAR AND KERNEL ROTS
by Paul Vincelli

Diplodia Ear Rot
Symptoms of Diplodia ear rot are present in corn fields where the disease has been active. Look for premature drying of the shuck. When husks are stripped back, one can find a white, moldy growth between kernels, usually progressing from the base of the cob upwards.

The fungus that causes Diplodia ear rot survives in infected stalk and cob residues, and its only significant host is corn. Thus, pressure from Diplodia ear rot is highest in continuous corn under conservation tillage. Even a one-year rotation can help reduce disease pressure significantly, but a two-year rotation away from corn is probably
advisable following severe epidemics. Bushhogging the residue following harvest may also contribute to disease control, by promoting faster decomposition of the infested residue. Certain seed companies have been evaluating their hybrids routinely for susceptibility to this disease. Thus, it is possible to select hybrids with reduced susceptibility, or “partial resistance” to the disease.

Scout fields now for the disease. Where 2-3% or more of the ears show symptoms of the disease, consider implementing some sort of management program against Diplodia ear rot next year. For more details, see the UK Extension publication PPA-43, “Ear Rot of Corn Caused by Stenocarpella maydis (=Diplodia maydis)”, available from Extension Agents or on the web at www.ca.uky.edu/agc/pubs/ppa/ppa43/ppa43.htm.

Aspergillus Kernel and Ear Rot and Aflatoxin
Infection of corn by the fungus Aspergillus flavus can lead to contamination with aflatoxins. These naturally occurring toxins are very uncommon in Kentucky, but occasionally they do occur and cause significant problems in marketing and utilizing corn.

Aflatoxin contamination can occur in the field, but normally does so only in sporadic instances during seasons with high temperatures, drought, and heavy insect feeding during grain fill. Weather conditions in most areas have not been favorable for preharvest aflatoxin this year. The fungus grows well on corn at 18% moisture stored at 86°F. Thus, fields which have experienced these conditions should be harvested at around 25% moisture and dried within 24 hours, in order to arrest any developing Aspergillus infection.

Postharvest contamination is a significant risk most years. Harvest operations create wounds which allow the Aspergillus fungus to infect kernels. Harvesting without a prompt drydown may lead to fungal growth and contamination. Shelled corn should be dried to 15.5% or below within 24-48 hours of harvest, to minimize the risk of mold growth and mycotoxin contamination. Natural air and low-temperature drying systems do not always achieve this when corn moisture exceeds 18% and are generally not recommended above this level.

For more information, see the UK Extension Publication ID-59, Aflatoxins in Corn, available through your Extension Agent or on the web at www.ca.uky.edu/agc/pubs/id/id59/id59.htm.

EVALUATE CORN FOR BORERS NOW
by Ric Bessin

Corn borer numbers have been variable this year with much of the state only lightly infested. In part this is due to the dry weather early in the spring which allowed producers to get most of the corn planted relatively early. In the past, the worst corn borer problems, both European and southwestern, have been associated with late planted corn. Moth trapping records from Princeton this summer have indicated a very small moth flight in that area. Traps in other parts of the state have revealed higher moth numbers.

Now is the time to begin evaluating corn fields for late-season European and southwestern corn borers. These late season larvae feed primarily in the ear zone of the plant and below, but may be found in leaf axils over the entire plant. Leaf axils, leaf sheaths, and ear shanks should be examined for live larvae or the sawdust like frass that signals their damage. Ear shank tunneling or stalk tunneling below the ear may lead to increased harvest losses this fall. Severity of the infestations will vary from field to field on a farm, so fields should be scouted individually.

Identification of heavily-infested fields and their early harvest (where possible) may be an effective strategy to harvest reduce losses due to broken or lodged plants and ear drop. It may be most profitable to harvest heavily infested fields early and dry the grain rather than risk harvest losses due to dropped ears and broken stalks. Heavily infested fields will also be more at risk to stalk rots which will also increase harvest losses.

Special attention should be given to late planted fields in the western half of the state, particularly near the Ohio River, as southwestern corn borer continues to be a serious problem in that area. In September, southwestern corn borer larvae that will overwinter travel to the base of the stalk, make a chamber in the stalk below ground, then girdle the base of the stalk. For this reason, fields that are heavily infested with southwestern corn borer should be identified and harvested as early as
appropriate. Late planted fields are most likely to be attacked by these late season infestations. Fields planted in early to mid May in western Kentucky should be considered late plantings.

**SOYBEANS**

**GREEN CLOVERWORM: THE SECOND GENERATION**

by Doug Johnson

Several individuals have noticed an unusual number of dark grey moths flying around the edges of soybean fields. These are adult (moths) green cloverworms. Although most people have not noticed, we have already had one generation of this pest. It is now about time for the second generation.

In most years neither generation of green cloverworm is of interest to most people. However, this pest can occur in “outbreak” numbers. It is worth checking your fields.

Larvae are slender and light green caterpillars with three pairs of white stripes running the length of the body. There are three pairs of legs near the head, three pairs of fleshy legs near the middle of the body and a pair of fleshy legs at the tail end. Green cloverworms wiggle violently when disturbed. These caterpillars are often parasitized or diseased. Parasitized larvae will have small eggs on their body often near the head. Disease larvae may appear “watery” and behave sluggishly or be covered in a fungal growth.

Green cloverworms feed extensively on soybean leaves. Young larvae skeletonize the underside of the leaf. Older larvae eat all of the leaf except the largest veins.

In wide row beans sampling can be done using the shake cloth sample. Make one four foot shake-cloth sample per location. Do not count the parasitized or diseased larvae. In large narrow row beans you will probably be better trying to estimate the percentage of defoliation the worms have caused.

Treatment decisions are based on a variable threshold scheme: either the number of green cloverworms per row foot or the percentage of defoliation. These tables can be found in ENT-13, Insecticide Recommendations for Soybeans and in IPM-3, IPM Scout Manual - Soybeans.

Green cloverworms are not hard to kill. The important part of control is finding populations before they have caused too much defoliation and insuring that a treatment is not made to a population too small to cause economic problems.

**SOYBEAN APHIDS CONTINUE TO BECOME MORE COMMON**

by Doug Johnson

We continue to find soybean aphid populations across the state of Kentucky. Agents, producers and consultants should be aware of the presence of this pest and be on the look out for them. In most cases the numbers of aphids remain low. However, in a couple of areas numbers are increasing at least in the small samples we have taken.

If you have not heard of this insect pest please see the articles in previous issues of Kentucky Pest News:

KPN #928 Aug. 8,
http://www.uky.edu/Agriculture/kpn/kpn_01/pn010806.htm#soyaph
and
KPN #929 Aug. 13,
http://www.uky.edu/Agriculture/kpn/kpn_01/pn010813.htm#soysoy

If you would like to keep up with what is happening in states to the north of us visit the 2001 Aphid Watch Site at:

http://www.pmcenters.org/Northcentral/Saphid/Aphidindex.htm

Remember this data will always be a little behind as it takes time and effort to collect and enter the information.

**FRUITS**

**APPLE FRUIT DISEASES CAN BE DEVASTATING**

by John Hartman
This is the time of year when apple fruit diseases appear with great frequency in orchards and backyard trees. Although early spring weather was dry, wet weather during some parts of the summer have both favored disease development and prevented timely applications of pesticides. Orchard and tree sanitation and vegetation management programs may have also suffered. The following list describes some of the fungus-caused diseases of apple fruits we expect to see now.

**Apple scab** -- Look for dark gray to brown, corky spots, uneven or deformed fruit growth, and skin and flesh cracking. Pin point scab with rough, black, circular spots may develop in storage following late season infections. We are seeing less apple scab on the fruit this year because of the early spring dry weather.

**Bitter rot** -- Usually, bitter rot infections produce slightly sunken, circular brown spots that may be surrounded by a red halo. When the spot becomes nearly an inch in diameter, spore-bearing structures appear in concentric circles on the diseased apple surface. Spore masses may be seen as orange to pink sticky material on the rotted spots. A brown decay beneath the diseased spot extends towards the fruit core in the shape of a cone. Kentucky growers sometimes have severe problems with bitter rot.

**Botryosphaeria rot (white rot)** -- The disease first appears as sunken, circular, tan to brown spots, often with a reddish or dark halo. Scattered clumps of tiny dark fungal pycnidia (fruiting structures) may appear on the surface. As the decay expands, the rotted area extends towards the core as a cylinder of affected tissue. The decay is soft and watery, having a clear to light tan color under warm weather conditions. These decay characteristics separate this disease from black rot and bitter rot.

**Black rot** -- On mature fruit, diseased spots, surrounded by a red halo, appear black (often with alternating concentric rings of black and brown) and are not sunken. The decay is firm and dark; the surface of diseased fruit may show scattered black fruiting structures of the causal fungus. Another phase of this disease, frogeye leaf spot, can be observed in early summer.

**Sooty blotch and flyspeck** -- Colonies of the sooty blotch fungus may appear on the fruit surface as circular to irregular areas of dark fungal growth having a sooty appearance. Flyspeck colonies appear as well-defined clusters of shiny, black superficial dots. These two fungi often appear on the surface of the same fruit. Although the fungi are superficial, infections affect the keeping quality of the fruits and makes them less salable. Sooty blotch and flyspeck are already present on unsprayed fruit.

**Cedar quince rust** -- A large, dark green diseased area appears on the calyx end of the fruit, causing puckering and distortion. The brown, spongy tissue beneath the affected skin may extend to the core. If high levels of cedar apple rust are observed on apple leaves this year, one might expect more cedar quince rust as well.

**Powdery mildew** -- The surface of the fruit may be covered with a network pattern of russetting (cork cells). Powdery mildew levels appear to be fairly low this year.

**Cork spot** -- This problem is not caused by fungi, but by calcium deficiency. The symptoms, small, circular, reddish sunken spots with brown flesh beneath, are similar to some fungal diseases.

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**GRAIN FUMIGATION**

TAKE CARE WHEN FUMIGATING GRAIN FOR DELIVERY

by Doug Johnson

All over Kentucky producers are delivering wheat to buyers. As this unloading begins many producers notice that their wheat contains insects. Unfortunately discovering this problem when one is under pressure to deliver grain only compounds the problem. Some producers in a rush to deliver their wheat will attempt to fumigate the grain on the truck while in transit to the buyer. This is dangerous and illegal. It is permissible to fumigate a truck load of grain. A truck load of grain is treated just like any other flat storage. However, it is illegal to move the truck during fumigation and before it has be properly aerated. Attempting to fumigate on a moving truck endangers the driver and passengers, drivers and passengers in other vehicles and those persons...
inspecting the grain at the point of delivery. Many buyers will reject a load if they detect the presence of fumigant during their inspection.

In addition attempting to fumigate on a moving truck is likely to result in a very poor result. Fumigants are easily moved by air currents, and are likely to be sucked from the truck bed by the least little air leak. The best course is to monitor grain through the storage period and if problems are found to address them within the bin. If this is not practical then plan to fumigate on the truck bed with plenty of time to load the truck, fumigate, and aerate the grain, using all the standard precautions.

Every fumigant available for use by producers has a detailed label and a use manual available with the product. Read and understand these documents before you ever try a fumigation. Fumigants are very good at what they are designed to do if applied correctly. They are however, among the most toxic compounds a producer will ever handle. Don't endanger yourself and others by getting in a hurry.

CHANGE IN SPECTRO LABEL FOR GRAY LEAF SPOT
by Paul Vincelli

The labeled rate of Spectro 90WDG against gray leaf spot has been lowered, as a result of an effort to reduce exposure to chlorothalonil under the Food Quality Protection Act. For more information, see http://www.uky.edu/Agriculture/kpn/kpn_01/pn010326.htm#lawcha.

The maximum labeled rate against gray leaf spot is now 5.76 oz/M, instead of the 8 oz that has been widely tested. While this reduced rate lowers the overall exposure to chlorothalonil, this also means that less thiophanate methyl is being applied than before. We are testing lower rates of this product this year, but in the meantime, golf courses experiencing high pressure from gray leaf spot should make their own tank mix of a product with thiophanate methyl (such as Cleary's 3336 at 6-8 oz) plus a chlorothalonil product at its highest rate under the current label. This type of treatment has provided excellent protection as well as good curative activity in previous spray trials.

CRICKET WARS
By Mike Potter

"Hundreds of black, ½ -inch long bugs are hopping out of my grass, flower beds, and onto my patio. When I open the garage door in the morning, a bunch more jump inside. What are these critters and how do I get rid of them? Several homeowners have called with this complaint in recent weeks. The culprits are field crickets. Warm, humid conditions often produce outbreaks of field crickets during late summer in Kentucky. Infestations are especially common in thatchy lawns and around buildings that are heavily mulched, landscaped or overgrown. Crickets lay their eggs in moist soil; consequently, homeowners who irrigated regularly during July appear to be having the worst problems. Immatures (nymphs) pass through several stages or instars, and there may be 1 to 3 generations per year.

Management -- Field crickets are primarily a nuisance pest; they do not bite, transmit diseases or infest foodstuffs. Since they are dependent upon moisture, they typically do not survive indoors more than a few days. One option is to do nothing other than vacuum or sweep up those that manage to get inside. Removing excess mulch (a 2 to 3-inch layer is plenty for landscaping), weeds and debris close to the foundation will make the area less attractive to crickets. Installing tight-fitting door sweeps, sealing cracks, and performing other forms of exclusion (see Entfact-641 How to Pest-Proof Your Home) will further limit the entry of crickets, spiders, ground beetles and other unwanted pests. For clients demanding immediate relief, pest proofing can be supplemented with exterior insecticide treatment. Homeowners will get the most for their efforts by applying longer-lasting liquid formulations containing synthetic pyrethroids (e.g., Bayer Advanced™ Lawn & Garden Multi-Insect Killer Concentrate, Spectracide Bug Stop™, Ortho Home Defense System™). Sevin (carbaryl) also is effective. Apply with a pump up sprayer, hose end sprayer, etc. treating along the bottom of exterior doors, up underneath siding, and around the outside perimeter of the foundation in a 2 to 6-foot wide band along the ground, and 2-3 feet..."
up the foundation wall. Pay particular attention to the crack where grass meets the foundation. Homeowners or businesses who choose not to tackle these activities may wish to hire a professional pest control firm. Field cricket problems subside with the onset of cooler weather.

**DIAGNOSTIC LAB HIGHLIGHTS**

by Julie Beale and Paul Bachi

Diagnostic samples this past week have included corn with southern leaf blight and Stenocarpella ear rot; sudden death syndrome of soybean; black shank, blue mold, brown spot, frogeye, and target spot on tobacco.

On fruits and vegetables, samples included bitter rot and fireblight on apple; scab on peach; internal breakdown (physiological) on pecan; anthracnose and Pythium stem blight on bean; anthracnose on melon; alfalfa mosaic virus and tobacco mosaic virus on pepper; Microdochium blight and downy mildew on pumpkin; and bacterial canker and bacterial spot on tomato.

On ornamentals, samples included black root rot on fuchsia; powdery mildew on sedum; Phytophthora aerial blight on vinca; Pythium root rot on poinsettia; gray leaf spot on perennial ryegrass; brown patch on tall fescue; Cercospora leaf spot on hydrangea and willow; Phytophthora crown rot on rhododendron; scab on crabapple; Marssonina leaf spot on birch; Cylindrosporium leaf spot on mulberry and walnut; and brown spot needle blight on pine.

**INSECT TRAP COUNTS**

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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.