



# KENTUCKY PEST NEWS

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## CORN

### **SOUTHWESTERN CORN BORER UPDATE**

**By Ric Bessin**

Initial indications are that this could be a record year for the second generation southwestern corn borer moth flight. (Last weeks' trap catch was 258 compared to 164 during the previous week). What does this mean for corn producers? Southwestern corn borer appears to be a very serious threat this year, particularly with the large amount of late-planted corn this year. With the flooding early this past spring, there is a high percentage of river bottom fields that were planted late and are potentially at risk to this pest.

While both generations of the Southwestern corn borer can cause yield loss to corn producers, it is the second generation that is the most damaging. These larvae begin feeding in the mid- and lower zones of tassel-stage corn in mid to late July. Typically, they feed between the layers of husk on the primary ears. After about two weeks, the larvae begin tunneling in the stalk. Characteristically, they make a straight line through the middle of the stalk. The second generation will overwinter as larvae. These larvae move to the base of the plant and girdle the plant before tunneling downward. This is the most serious damage caused by this insect.

Larvae girdle the stalk by chewing an internal groove around the stalk about an inch above the soil line. This leaves only a thin outer layer of the stalk for support.

Now is a good time to monitor fields that have had a history of Southwestern corn borer, or fields in the western portion of the state that were planted late. Producers should try to distinguish between European and Southwestern corn borers. The European has a dark head, a pinkish white body, and faint gray stripes running the length of the body. The southwestern corn borer has a dark head and a creamy-white body with many black spots.

Producers should identify fields with high southwestern corn borer levels. Because the larvae attack the base of the plant, insecticidal control is difficult. These fields will need to be harvested as early as possible to minimize losses from lodging. For more information on southwestern corn borer, see **ENTFACT 108, *Southwestern Corn Borer***.

## TOBACCO

### **CURRENT BLUE MOLD STATUS**

**By William Nesmith**

A blue mold warning exists statewide in Kentucky, southern/southeastern Indiana and southern Ohio.

Disease levels are increasing very fast in this three-state region with damaging levels of activity being reported from most tobacco producing communities. Moreover, in many communities this blue mold epidemic is occurring in complex with two other foliar diseases, target spot and angular leaf spot. Should this complex of diseases continue, loss of leaf could be great, because the other two diseases are using tobacco leaf tissues weakened by blue mold as their infection courts. Target spot is likely to be the more serious disease in areas that received the flooding recently. Unlike blue mold which attacks mainly excellent crops of tobacco, target spot will also attack less vigorous crops. Major crop damage has occurred this past week and weekend from flooding and saturated soils.

Acrobat MZ will not control either of the other two foliar diseases. Where developing blue mold lesions are checked by fungicide or heat, the weakened tissues are ideal infection sites for either of the other pathogens as long as the foliage remains wet and the soils saturated. What this region needs now to control the diseases is dry sunny weather, but when that happens, expect scalding of tobacco foliage if the soil is saturated. It is rough on the tobacco farm right now!

Let's keep in mind, however, that the level of blue mold/complex is highly variable within communities about the Commonwealth, so the local County Extension Office will be the best source of status information. The situation could change rapidly with the weather events currently being experienced. The strongest activity was occurring in foggy areas of northern and central Kentucky, but hot spots were reported from most counties. The last 7 days have provided near ideal conditions for the blue mold fungus and the complex to operate in almost all of the Ohio River Valley; furthermore, fields have been too wet to support spray equipment in many areas. Sporulation has been heavy and infections rates should have been high on Tuesday, Wednesday, and Thursday nights throughout the region. On July 22, expect to see the lesions developing from activity that started last week. Where other diseases are involved in a foliar complex, leaf loss should already be evident.

Expect strong activity in the lower and mid stalk leaves of crops at all stages up to 7 days post-topping, plus extensive vein/midrib strikes in the upper portions of plants between knee-high and button stage. Some fields of lush tobacco have

already sustained serious leaf damage from the July 4-7 episode. New systemic activity is also likely in newly set crops and those still within cultivation stage. Target spot, alone or in complex, will be worse on the lower half of the plant, while new angular leaf spot activity will be stronger in the mid to upper stalk positions. Target spot and angular leaf spot, plus other bacterial diseases, can also become very active in topping stage tobacco should the crop foliage become damaged with excessive rates of sucker control chemicals.

Although much lighter blue mold activity is being reported from western Kentucky, agents there reported increasing activity, too. Even if higher temperatures check blue mold, target spot and angular leaf spot could still be serious problems, especially in areas receiving the heavy rains on Tuesday and Wednesday. Very strong activity was reported on Thursday from the foggy areas of Meade, Hardin, Grayson counties and on south to Allen and Barren counties.

**CONTROL RECOMMENDATIONS:** Maintain aggressive (5-7 day interval) fungicide spray programs in communities where blue mold is active and weather favorable to blue mold persists. Crops of rapidly growing, uniform tobacco are at greatest risk. Adjust sprayers to obtain complete coverage of ALL tissue. Acrobat MZ is the superior product, by far, when applied correctly and timely. Dithane DF should be considered as an alternative only for situations of low risk and where a good sprayer is available - one that will give excellent coverage of the foliage. However, the sprays should be maintained at least weekly where Dithane is used.

No labeled fungicides are available to assist in the control of target spot. Streptomycin at the 200 ppm rate, applied at the same gallons and methods as for Acrobat MZ, is excellent in the control of angular leaf spot. However, best results occur when it is applied alone, not tank mixed. The Acrobat MZ label does not authorize tank-mixing with streptomycin.

We have been flooded with calls about Quadris fungicide. This fungicide is NOT labeled on tobacco. Yes, UK and NC State plant pathologists, and others, are researching it. It does have some ability to control blue mold, but it is NOT equal to Acrobat MZ. Acrobat MZ has the ability to prevent infection and stop sporulation of active lesions. Quadris basically operates by preventing infection with limited impact on sporulation. It has caused

light to moderate phytotoxicity in several studies, including mine. Hopefully, it will become useful as a replacement for mancozeb in tobacco fungicides, not to replace dimethomorph.

## **EXPECT HOLLOW STALK IN TOBACCO, TAKE STEPS TO MINIMIZE IT** **By William Nesmith**

Tobacco growers should expect increased hollow stalk and bacterial soft rot as a consequence of the wet growing season being experienced. This disease is very sporadic in occurrence from season to season and farm to farm, but can cause extensive losses at times. It is caused by the bacterium, *Erwinia carotovora* subsp. *carotovora*, a natural inhabitant of all soils and also hosted by most weeds.

This same organism causes blackleg and house burn of tobacco. So also expect higher levels in fields set with plants experiencing blackleg. Also, expect greater houseburn potential in crops harvested with hollow stalk. Although highly effective controls are not available, there are some cultural steps that will help reduce losses from this disease. Since there are no rescue approaches, certain alternative practices warrant consideration during protracted wet season.

The alternative practices in consideration may complicate normal production methods, so growers are not likely to make adjustments unless they appreciate the basic pathology involved. There are two key factors of pathology driving this disease: The pathogen is a wound invader, so wounds are needed to drive the disease. And, this pathogen becomes a resident of the tobacco leaf surface during wet weather, living on the leaf surface and in small wounds and ready to invade any major wounds. It will remain there and increase its numbers as long as humidity remains high. Be especially aware of its explosive potential when wounding succulent crops during hot, humid, periods of overcast weather or in shady sites.

Hollow stalk in the field is usually seen at cutting time, but most infections occurred at topping time. The bacterium infects through wounds made by topping, especially rough wounds that hold water. The bacterium begins to rot the pith, spreading rapidly down the stalk in the pith. 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 stem. The

disease can begin at any point of wounding on the stem (i.e., hail marks, dead suckers, leaf spots, etc).

It is 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, when 50% or fewer plants in the field have one flower per inflorescence open. Carefully remove any suckers that might be present, those left on the plant and killed by sucker control chemicals become ideal sites for hollow stalk to begin.

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. Topping and suckering during damp or cloudy weather increases hollow stalk activity. Workers rubbing soil on their hands to remove excess gum increases 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, to reduce the chances of spread. Such early infections are most likely to occur in low wet areas or shady areas of the planting.

The method of sucker control can affect hollow stalk activity. Sucker control chemicals that actually kill the suckers, those with contact type activity on the sucker, tend to increase hollow stalk. 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. Also, serious hollow stalk and soft rot of leaves has been observed where crops of succulent tobacco were damaged with high rates of MH-30. In other words, take steps to avoid stalk and leaf damage where possible and realize that damage you can get by with in drier seasons can become costly in wet seasons.

## **DROWNING OF TOBACCO** **by William Nesmith**

Recent storms have resulted in drowning of tobacco in much of Kentucky. Crop losses from drowning are high. The purpose of this article is to help growers understand how the damage occurs because it takes many forms.

When soil temperatures are high tobacco plants are

damaged quickly when in saturated soils. The problems result from low oxygen levels in the root zone, which prevents adequate water uptake to supply the foliage as well as death of critical root and vascular system cells. Standing water is not necessary, only saturation of the soil, so the damage is not confined to low spots. Furthermore, the effects from drowning events can form a complex that last for the rest of the season.

The above ground symptoms vary depending on which roots are damaged, the evaporation rate, and when the affected plants are observed relative to the drowning event. Furthermore, symptoms of drowning over-lap with several infectious diseases such as black shank, soreshin and the vascular wilt diseases. The most acute symptoms relate to sudden wilting (flop), yellowing and death. However, equally damaging, are the symptoms developing more slowly such as stunting, yellowing, and secondary infectious disease development.

Tobacco is very susceptible to low oxygen levels in the root zone. Where soils remain saturated for several hours at high temperatures the oxygen level is depleted quickly. As a result, respiration levels of deep roots are slowed markedly which results in death of the tissue systems requiring the greatest amount of oxygen, such as cortex and cambial areas. This impairs the root system's ability to work, so the above ground symptoms relate to inadequate water and or nutritional problems. When transpiration from the leaves is high, rapid wilting occurs and can result in plant death if the plants are large. Crops often flop as soon as the sun appears following this event. However, the plant may experience only temporary wilting followed by yellowing and stunting where either root damage is limited, the evapo-transpiration rates remain low until the soil drains, or the plants are smaller. In these situations, however, plants often become infected with *Fusarium* resulting in reddish brown rots of the vascular system and cankers on the lower stem, resulting in serious stunting and even death later in the season.

Black shank, *Fusarium* wilt, and *Rhizoctonia* often appear in site with drowning. It is important to properly diagnose what is going on, especially for making plans for future crops on the site. Do not just assume all is drowning or all is black shank. Race 0 of black shank can be especially serious on L8 hybrids, where flood water carrying the fungus contacts the stem. So where drowning has occurred, plants should be checked again for infectious diseases if plant death continues.

In fields with a history of black shank, additional applications of Ridomil Gold at 1 pt/A applied to the soil should help reduce losses from black shank. Labels allow application until layby stage. It is important to get these supplemental treatments applied as soon as possible after the flooding event, even if they must be walked-on. In small tobacco, cultivation and additional applications of nitrogen should be considered to stimulate new root development on the stem and replacement of leached nitrogen.

## **CHECK TOBACCO BARNs FOR HORNETS AND BUMBLE BEES BEFORE HOUSING TIME**

**by Lee Townsend**

Paper wasps, hornets and yellowjackets, and bumble bees often nest in and around barns but also can occur in some unexpected places. Last week at the Princeton Field Day, a nest was discovered in the hollow tongue of a wagon. In addition to painful stings, people working high up on rails in a barn can be injured as they try to escape these angry insects. As if this were not enough, some people can have a severe allergic reaction to the venom of these insects. Wasps, hornets and yellowjackets are more dangerous and unpredictable than honey bees and should be treated with respect; nests should be eliminated with great care and in a specific manner.

Paper wasps, hornets and yellowjackets construct nests of a paper-like material which is a mixture of finely chewed wood fragments and salivary secretions of the wasps. Paper wasps typically build their umbrella-shaped nests under eaves and ledges. These wasps are not as aggressive as yellowjackets or hornets, and can be eliminated rather easily with a wasp and hornet spray sold at most grocery and hardware stores. These formulations have an added advantage in that they often spray as far as 20 feet.

Treatment of wasps, hornets, and yellowjackets is best performed at night; paper wasps can be eliminated during the daytime provided you do not stand directly below the nest during treatment. Most wasp and hornet sprays cause insects to drop instantly when contacted by the insecticide. Standing directly below a nest increases one's risk of being stung. Following treatment, wait a day to ensure that the colony is destroyed, then scrape or knock down the nest. This will prevent secondary problems from carpet beetles, ants and other scavenging insects.

Hornets are far more difficult and dangerous to

control than paper wasps. The nests resemble a large, inverted tear-drop shaped ball which typically is attached to a tree, bush or side of a building. Hornet nests may contain thousands of wasps which are extremely aggressive when disturbed. Treatment can be accomplished by applying a wasp freeze-type, aerosol insecticide or dust formulation (Sevin) directly into the nest opening.

Hornet nests have a single opening, usually toward the bottom, where the wasps enter and exit. It is essential that the paper envelope of the nest not be broken open during treatment or the irritated wasps will scatter in all directions, causing even greater problems. Following treatment, wait at least a day before removing the nest to ensure that all of the wasps are killed. If hornets continue to be observed, the application may need to be repeated.

Bumble bees can nest in small piles of hay, paper, or other similar materials, usually at ground level. Look for activity around the barn and deal with it before the rush of housing begins.

## **LIVESTOCK**

### **JULY 31 - OPENING OF CATTLE GRUB TREATMENT SEASON** **by Lee Townsend**

Application of a cattle grub treatment is one of the Kentucky CPH requirements. Cattle grub infestations necessitate more trimming of carcasses and decrease the value of hides. Grubby carcasses are routinely docked by packers.

Cattle grub control is a part of producing quality steers for the feedlot. While the damage (cysts or swellings long the back line) will not be evident for several months, control measures must be applied to Kentucky cattle before October 31 to kill the pest without harming the animal.

#### **Host Reaction to Cattle Grubs**

Depending upon the species, cattle grub larvae move either to the esophagus (common cattle grub) or spinal column (northern cattle grub) during their migration to the back. The grub larvae are in these sensitive areas during November and December. If large grubs are killed there, the surrounding tissue can become severely inflamed and additional

symptoms can develop.

In animals infested with the common cattle grub, the esophagus can swell shut, and produce difficulty swallowing, drooling, or bloat. Northern cattle grubs killed in the region of the spine can put pressure on the spinal column. This results in stiffness in the hind quarters, loss of balance, or inability to lift the hind feet.

Be careful when treating for grubs. Use accurate weight estimates to determine the proper dose. Undertreating may not provide satisfactory control. At best, overtreatment will waste money; at worst, it may cause the animal to become sick.

There are a variety of formulations of cattle grub insecticides. Pour-on or Spot-On products are convenient if good handling facilities are available. High pressure sprays are a good choice when chutes or working pens are not an option. Animals must be wet to the skin when high pressure sprays are used. Ivomectin or related products, used as a dewormer in the fall, will also control cattle grubs. There is no need to treat with an insecticide, too.

## **FRUIT**

### **JAPANESE AND GREEN JUNE BEETLES** **by Ric Bessin**

It's time again to fight our annual battles with the Japanese beetle and green June beetle in fruit crops. Japanese beetle numbers have been down in eastern and east central Kentucky but they are increasing in some western counties. Typically, adults begin to emerge in damaging numbers during the first week of July. Activity is most intense over a 4 to 6 week period beginning in late June.

Japanese beetles feed on about 300 species of plants, devouring leaves, flowers, and overripe or wounded fruit. The beetles are most active on warm, sunny days, and prefer plants that are fully exposed to the sun. While a single beetle does not eat much; group feeding results in severe damage.

The green June beetle does not feed on foliage, it feeds directly on ripening fruit. Although damage to peaches is most commonly noted in our area, the fruits of apple, cherry, peach and plum trees may also be attacked. Ripening or diseased fruit is particularly attractive to the beetles.

Fruit and foliage may be protected from damage by either of these pests by spraying an insecticide such as Sevin when the first beetles appear. If large numbers are present in the area, it may be necessary to reapply the insecticide if the beetles reinfest the plants. Sevin usually provides 3-5 days of residual control, and the XLR formulation should provide even longer residual control. Control of the grubs in the orchard and surrounding pasture has no effect on the adults attacking fruit trees because they are such strong fliers.

## VEGETABLES

### TOMATO DISEASES APPEARING IN THE HOME GARDEN

by John Hartman

County Extension Agents are reporting increased outbreaks of home garden tomato diseases. These reports are bolstered by numbers of specimens sent to the plant disease diagnostic laboratory and on field observations. The following are some of the garden tomato maladies observed.

Fungal Leaf Spots. Both early blight (*Alternaria solani*) and Septoria leaf spot (*Septoria lycopersici*) diseases are widespread. The diseases have been favored by the rain and leaf wetness we have had this summer. Early blight is characterized by the brown, somewhat target-shaped leaf spots, often becoming a half-inch or more across. As the lesions coalesce, the leaves turn yellow, become blighted and may hang from the plant as curled, brown dead foliage. For Septoria leaf spot, the end result is the same, but the spots are tan, fairly circular, and usually remain under one fourth-inch in size. Close examination of the spots may reveal tiny brown to black pycnidia, the fruiting bodies of the fungus. These two diseases can be prevented by application of fungicides containing chlorothalonil, available at garden stores. However, little benefit is achieved if one waits until strong activity exists, before starting spray programs. In wet seasons like this one, weekly sprays are needed from the first lesions until fall.

Fruit Rots. Blossom-end rot is not as common as in most years; perhaps uneven soil moisture supplies that promote this problem have not been as common as in the past. There is some buckeye rot (*Phytophthora* spp.) which causes dark brown to black areas to develop on the fruit surface followed by

decay. Unlike blossom-end rot, the blackened area is not sunken, and it may appear anywhere on the fruit, but usually on that part touching the soil or closest to the ground. Mulch can be used to reduce exposure of the fruits to the soilborne fungus and will also help reduce the occurrence of blossom-end rot. The late blight fungus, *Phytophthora infestans* can also cause blackened areas of the fruit, but may be rough and sunken at the margins compared to buckeye rot. Late blight also attacks the foliage, blighting leaves, petioles and stems. Home garden fungicides containing chlorothalonil can be used to prevent fruit rots cause by these two fungi.

Wilt Diseases. Walnut wilt has been observed. Whole plants wilt and die due to exposure to the toxin, juglone, produced usually by the roots of walnut trees growing near the garden. The toxin can even be produced by roots decomposing in the garden soil after the trees have been cut down. A brown staining of the xylem tissues in the stem can be seen when cut open. A similar dark staining of the xylem may occur when Fusarium wilt (*Fusarium oxysporum* f.sp. *lycopersici*), Verticillium wilt (*Verticillium dahliae*) and even with root-knot nematode (*Meloidogyne* spp.). Use of VFN tomato varieties will prevent the latter three diseases, and provide helpful information for disease diagnosis.

Bacterial Spots. Bacterial spot (*Xanthomonas campestris* pv. *vesicatoria*) and bacterial speck (*Pseudomonas syringae* pv. *tomato*) have been observed in commercial fields, and sometimes in home gardens. In some cases, the microbe causing bacterial spot may have been splashed to tomatoes in the garden from infected pepper transplants which were being sold at some garden stores this spring. Bacterial spot appears as dark, somewhat angular moist-looking spots on leaves and fruits. Disease-control chemicals containing fixed copper, such as Bordeaux mixture may help suppress this disease, but copper-containing chemicals are only partly effective and may be phytotoxic.

Stem Cankers. Bacterial canker (*Clavibacter michiganensis*) is occurring in commercial tomatoes, but less commonly in home garden tomatoes. Look for brown lesions on petioles and stems and wilting and drying of foliage associated with the cankers. The early blight fungus also causes brown lesions on leaf petioles and stems, and as is seen on the leaves, the typical concentric texture of the lesion should be visible.

Mosaic. Tomato mosaic virus can cause mottling and

mosaic symptoms and somewhat deformed growth of the leaves and uneven ripening and gray wall of the fruit. Where TMV occurs in the home garden, look at the practice of saving tomato seeds from tomatoes harvested one season and planted the next as a possible practice which perpetuates the disease.

## PLANT DIAGNOSTIC HIGH-LIGHTS

By Julie Beale and Paul Bachi

We have seen a number of cases of **zinc deficiency** on **corn** lately; this condition is typical under high soil pH.

On **tobacco**, foliar diseases are common--**blue mold, target spot, and angular leaf spot**, as well as **frogeye leaf spot** occasionally. We are continuing to see the **black shank/soreshin complex** and have also diagnosed several cases of **root knot nematode**.

In the landscape, we have diagnosed **black root rot** on **petunia, geranium rust, maple anthracnose**, damage from **azalea lace bug** on **azalea** and Japanese beetle on a number of landscape plants.

On fruits and vegetable we are seeing a number of infectious diseases and other disorders, including **anthracnose and Septoria leaf spot** on **raspberry; cane blight on blackberry; white rot and scab on apple**; anthracnose on cucumber and **gourd; bacterial canker, buckeye rot, early blight, Fusarium stem rot, tomato mosaic virus, Septoria leaf spot and walnut wilt** on **tomato**.

## PESTICIDE NEWS AND VIEWS

### AT LAST, ZOOLOGISTS MAY KNOW WHAT IS KILLING THE WORLD'S AMPHIBIANS; A GREAT LEAP FORWARD

New Scientist press summary:

Frogs and toads throughout the world are being killed by a fungus that is new to science. The fungus, which coats their undersides and legs, is thought to be suffocating the animals, which breathe through their skins. It could be a major factor underlying the decline in amphibian populations reported worldwide. The fungus has been found independently by teams in the US and Australia. It belongs to a new genus of chytrid, a group thought to be related to the earliest fungi. Although other chytrids parasitize a range of organisms, from microscopic algae to

insects, they have never before been found to cause disease in vertebrates. The fungus, which has yet to be given a scientific name, is known to have struck down 10 species of frogs and toads from 10 locations in Australia, seven species from two locations in Panama, a toad from southern California, and six species of frogs in four American zoos and aquariums.

"There's little doubt that this is a worldwide phenomenon," says Allan Pessier, a veterinary pathologist at the National Zoological Park in Washington DC. The scientists don't yet know if the fungus is the primary cause of death, or is killing animals weakened by other factors, such as ultraviolet radiation penetrating the atmosphere due to the thinned ozone layer or agricultural chemicals. "Many factors could be at work, but the fungus is probably right up there," says Pessier.

Nobody knows where the fungus came from, or how it is spread. It was first noticed by Don Nichols, a colleague of Pessier's at the zoo in Washington DC, in arroyo toads, *Bufo microscaphus californicus*, from a captive colony in California. At first Nichols didn't recognize it as a fungus. Because infected skin contained a proliferation of round cells, rather than fungal filaments, Nichols thought it was a protozoan. Earl Green of the Maryland Animal Health Laboratory in College Park made the same mistake when he examined specimens collected in 1996 and 1997 from western Panama by Karen Lips of St Lawrence University in Canton, New York. By 1996, Nichols and Pessier had begun to doubt the protozoan diagnosis. Then an outbreak of the infection began to ravage the National Zoological Park's population of blue poison-dart frogs, *Dendrobates azureus*, which come from Surinam. Nichols and Pessier teamed up with Joyce Longcore, a chytrid taxonomist at the University of Maine in Orono, who described her findings to the Mycological Society of America in Puerto Rico last week.

## INSECT TRAP COUNTS

July 2 - 10, Princeton

Southwestern Corn Borer	258
European Corn Borer	15
Corn Earworm	103
Fall Armyworm	32

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Lee Townsend, Extension Entomologist