KENTUCKY PEST NEWS

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*CORRECTION: THE WHEAT ARTICLE BY DON HERSHMAN WRITTEN FOR THE JUNE 29TH KPN WAS IN ERROR. THE CORRECT VERSION IS INCLUDED IN THIS ISSUE.

CORN

FALL ARMYWORM IN CORN
By Ric Bessin

High numbers of fall armyworm larvae have been reported in whorl stage corn in several Kentucky counties. Producers with late-planted corn need to watch for this insect. This is another pest that migrates from southern states each spring and early summer and is favored by late planting dates. It prefers to lay eggs on whorl-stage corn. Fields planted after June 1 and that are still in the whorl stage in late July and early August are most likely to be damaged by fall armyworm. As with the European corn borer, timing is critical. The fall armyworm is most easily controlled while the larvae are small and before they fill the whorl full of frass.

Fall armyworm larvae resemble both armyworms and corn earworms, but the fall armyworm has a white inverted "Y" mark on the front of the dark head. The corn earworm has a orange-brown head, while the armyworm has a brown head with dark honeycombed markings. Also, fall armyworms have

four dark spots arranged in a square on top of the eighth abdominal segment.

Control needs to be considered when egg masses are present on 5% of the plants or when 25% of the plants show damage symptoms and live larvae are still present. Controlling larger larvae, typically after they are hidden under the frass plug, will be much more difficult. Treatments must be applied before larvae burrow deep into the whorl or enter ears of more mature plants. Insecticide applications by ground rig using at least 30 gallons per acre and high pressure will give the best results. In pretassel corn, direct spray directly over the whorl.

Producers who are growing Bt corn will need to watch for fall armyworm. While Bt hybrids control European corn borer and southwestern corn borer well, effectiveness against fall armyworm ranges from suppression to ineffective control. However, more information on protection by Bt-corn technologies against fall armyworm is needed. Generally, producers of Bt corn will still need to monitor their fields for fall armyworm. For more

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information, see ENTFACT 110, *Fall Armyworm in Corn*.

ALFALFA

BLISTER BEETLES AND WESTERN HAY
By Lee Townsend

Recent news indicates locally high blister beetle populations on alfalfa and some other crops in parts of Kansas and Oklahoma. There is no indication of the amount of acreage affected; in fact, only a few scattered fields may be involved. This information is passed along as an advisory only. Blister beetles are a consideration when buying hay from western states and they certainly appears to be worth discussing with the seller this season.

The prospect of blister beetles in hay is especially important to Kentucky horseowners who may be buying western alfalfa hay over the coming months. Cantharadin, a chemical present in these insects, is very toxic to horses. Ingestion of several dead beetles in hay by horses can cause severe reactions and even death. Cattle are much less susceptible to this material, which occurs naturally in the insect.

There is no way to sample hay thoroughly enough to determine the level of dead blister beetles in a load. It is truly the "needle in the hay stack" situation. Only a few beetles need to be eaten by a horse to cause a severe to fatal response.

Alfalfa growers in the Kansas - Oklahoma area are receiving this information. It will allow them to check for the problem and to deal with it appropriately. Good management practices are available. The beetles prefer to feed on flowers, so cutting alfalfa before the plants or weeds bloom will reduce their incidence. Also, blister beetles can be managed culturally by using mowers that don't crimp or crush alfalfa as it is cut. Beetles in the field will fly away as the hay dries and cures. An insecticide application also is a potential option.

These blister beetles occur in Kentucky during July and August. More information on them is available in Entfact 102 or over the web at
www.uky.edu/Agriculture/Entomology/entfacts/fldcrops/ef102.htm

TOBACCO

CURRENT BLUE MOLD STATUS
By William Nesmith

The risk of blue mold is highly variable about the Commonwealth, so the local County Extension office will be the best source of information. A blue mold watch exists state wide, with warning for all counties that have confirmed blue mold this season. The greatest threat will be to rapidly growing crops located in foggy situations, especially where night temperatures are below 72F for more than 5 hours nightly.

Several County Extension Agents reported observing moderate to strong new sporulation from abandoned plant beds and canopy-closed fields late last week. All reported the disease level was highly variable about the county and from community to community within the county. Based on such reports, it is assumed that new sporulation is occurring east of a north-south line from Logan, Butler, Muhlenberg, McLean, and Daviess counties. Strongest sporulation is expected in northern and central counties due to cooler temperatures and more cloud cover.

Blue mold has rebounded from the heat of mid-late June in many areas. Nearly ideal conditions existed on the night of July 7/8 to support strong sporulation and new infection in central and northern Kentucky, and even some isolated areas of southern and western Kentucky. Conditions favored infection on the night of July 8/9, within fields where the sporulation occurred and even some distance away where cloudy cover prevailed most of the day to protect the spores from UV light. The cool, drier weather experienced over the weekend slowed new sporulation and limited new infection, but was ideal for development of lesions resulting from infections early in the week. Therefore, moderate to heavy sporulation is expected on Monday night, July 13, from infections that took place early last week. New systemic activity is also likely in newly set crops and those still within cultivation stage.

Although much weaker activity was reported from most western, west-central, and south-central Kentucky, agents there reported that the disease was still active in ideal sites, especially in low areas of fields at topping stage and in creek and river bottoms. The higher temperatures experienced in these areas of western and southern Kentucky have prevented a great epidemic from developing, because the disease was positioned to have caused great damage, otherwise. Should a protracted wet period return blue mold could rebound quickly here too.

CONTROL RECOMMENDATIONS: Maintain aggressive (5-7 day interval) fungicide spray programs in communities where blue mold is active and blue mold favorable weather persists. This is especially needed in northern, central and eastern Kentucky in crops of excellent tobacco. Remember, blue mold causes the greatest amount of foliar damage to good crops, of heavy-canopied tobacco. Yes, it will attack poorly growing crops, but much less damage is done. In addition to local sources of spores, movement of windborne spores east and north will continue to threaten this region. Adjust sprayers to obtain complete coverage of ALL tissue. Acrobat MZ is the superior product.

Longer intervals (7-14 days) are appropriate for areas with less risk. However, 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, regardless of location. Dithane DF should be consider as an alternative only for situations of low risk and where a good sprayer is available - one than will give excellent coverage of the foliage. However, the sprays should be maintained at least weekly where Dithane is used.

SORESHIN OF TOBACCO
By William Nesmith

The disease of the lower stem and root called soreshin, is caused by the fungus *Rhizoctonia solani.* This disease has always been present in Kentucky, but it was seldom a serious problem until the past few years. It is very common in tobacco plantings about the state this season.

Stressed plants are very susceptible to soreshin. First symptoms are of small reddish-brown lesions on the stem and roots, which enlarge with time unless the plant is able to stop the pathogen. Infections can occur at any plant stage, but are most common in transplants and during the first month after transplanting, especially if poor growing conditions persist. Affected plants are not normally noticed until the lesions have girdled the plant, at which time the plant begins to yellow.

This yellowing symptom is easily confused with black shank, because with both diseases the lower stem darkens and disking may occur. However, with soreshin, usually the darkened area is brown and more woody than with black shank. In addition to microscopic examination, these two diseases can be distinguished by the lighter color of sore shin lesions and the dry hard nature of sore shin lesions which results from slower disease development. Complicating the diagnosis, however, these two diseases often occur together, one the same plant or in the same planting. Which came first then becomes an important question, especially where black shank resistant varieties are involved.

In other cases the plants may be stunted, where the plant is able to out-grow the fungus, the lower stem is constricted and the plant often will re-root above the canker; but plants with these symptoms are highly prone to lodging during high winds and yield poorly. Furthermore, during dry weather, these plants often suddenly wilt and die from soreshin.

The causal agent of soreshin is a common soil inhabitant; expect to find it in all agricultural soils. It is also an early colonizer of soil-mixes and fumigated soils. It grows best in moist soils at moderate to high temperatures. It has strong saprophytic ability, so it competitively colonizes organic matter, but it is a weak parasite, so it normally needs a weakened or young host plant to cause serious disease.

Greenhouse produced transplants that experienced soreshin and / or target spot are especially prone to soreshin in the field. The fungus easily colonizes the soil media and can grow from tray to tray. Rhizoctonia infections were the most common infectious disease diagnosed in greenhouse and float systems this spring. Setting infected plants has created ideal conditions for soreshin. We are seeing a lot of soreshin in float-produced plants where the disease was not detected in ground beds.

All of the above mentioned predisposing conditions have existed this season, which probably accounts for most of the increased incidence of this disease. Some other important stress events were the following: Seedlings may have been damaged in the seed bed when higher than recommended rates of fertilizer were applied to 'push' seedlings. Plants were held a long time allowing stem infections to become well established prior to setting. Beds were damaged by flooding. Clippings served as an organic foodbase for the fungus to establish and then moved onto the seedlings. Following the rainy month, grass and weeds were incorporated just

prior to transplanting, serving as a food-base to cause a "bloom" of Rhizoctonia. Early set plants went through the poor growing conditions from mid-May through mid-June and became very stressed, allowing Rhizoctonia a long period to slowly colonized and damage the plant. Such plants grow slowly then collapse when the shallow roots become dry. Setting more and more of the crop later in the season seems to be playing a role, as well.

Expect soreshin to develop all season as scattered plants continue to succumb to infections. However, do not expect the type of secondary spread that is common with black shank. Plants with the worst infection usually die with a month of transplanting, but a few plants become stunted, turn yellow, and die all season long, especially during periods of dry weather.

Pulling soil to the lower stem during early cultivations to encourage rooting higher up on the stem sometimes allows plants with mild infections to recover, especially if adequate soil moisture is maintained during the cropping season. This cultivation step is of more benefit in crops where herbicides were not use than in those where herbicides were correctly applied.

There are no chemicals registered for management of soreshin in the field. There is a connection between soreshin and black shank. Black shank resistant varieties planted in black shank infested fields may experience high rates of black shank, because soreshin-infected plants are unable to defend themselves adequately against black shank. The result is very damaging disease complex. Plants with systemic blue mold are also often finished-off by soreshin.

County Agents are urged to use the plant disease diagnostic labs, where microscopes are available, to distinguish sore shin and black shank, especially on farms where black shank has not been reported. Assuming that a few plants in the field have died from soreshin when in fact the problem is black shank can result in serious crop failure in the future.

BUDWORM BATTLES
By Lee Townsend

There have been some serious budworm infestations in tobacco with less than acceptable control in the eyes of the growers. A visit to several fields in a Barren county community on July 10 provided a chance to look at the situation. Affected fields had about 5% infested plants but some clumping of the plants accentuated the damage. Problem fields were transplanted in the May 28 - June 2 time frame. Fields set about 3 weeks later were “clean”, indicating that they missed the moth flight.

The culprit, a budworm, was a light green larva with a light yellow to green head. It had a relatively distinct white stripe along each side and some faint wavy with marks down the center of the back. All had the same coloring, often there is a wider range of color and marking on budworms.

Most of the worms that we found were 3/4" to 1" long. About 1/3 of them, usually on the small side, were in the bud area. The rest, usually in the 1" range, were further down the plant. Many of these had done at least some feeding on or into the main stalk. Neat, 1/4" diameter or larger holes could be found and many were tunneling in the stalk like a stalk borer. A few had chewed furrows down the outer surface of the stalk. No worms were found on many of the plants with older feeding damage. It was impossible to determine if they had been killed or simply completed development and entered the soil to pupate.

Why the control problem?

Unlike the easily-killed hornworm, budworms are tough customers. Even a treatment delivered right to their dining room will not kill all of them. Dipel, Golden Leaf, and Orthene all had their turn with no readily apparent difference between products.

In addition to being tough, many of the worms were feeding near the middle of the plant. This is a more protected site so they were less likely to be hit by spray particles or to feed on treated foliage. The movement of larger larvae to the stalk may have been due to the lower nicotine concentration in that tissue as compared to the lower, fully expanded leaves. In many cases, the bud leaves, also comparatively low in nicotine had been eaten.

What seemed to help?

The infestation was noticed relatively early so timing was pretty good. The initial applications were made with a cone nozzle over the row- good nozzle selection and placement. The initial applications were made using 20 gallons of water

per acre. Later applications in some fields were made at slower speeds which in effect doubled the gallonage. Control appeared to be somewhat better in these instances, presumably due to more thorough coverage and spray material running down the stem to larvae feeding lower on the plant.

Outlook

While worms can still be found feeding in all of the fields with significant damage, most are older and larger, there were no indications of continued egglaying and small larvae. By the time that the next generation is active, the early-set plants probably will be nearly ready to top. The potential for problems is with the late-set fields that will be about knee-high when these moths fly. Close field checks, prompt treatment, and plenty of water are included in the plans for managing these insects in late July.

GRASSHOPPERS MAY MOVE FROM PASTURES
By Lee Townsend

Grasshoppers have been abundant in many parts of the state so far this year. There are still concerns in some areas, especially in grassy areas adjacent to tobacco. Walking or riding slowly through these areas will allow a crude assessment of there numbers. If there is an average of 15 or more per square yard, an insecticide application should be considered to prevent movement into tobacco. It is much easier to deal with them in a pasture or hayfield than after they have entered tobacco. Sevin and malathion (Cythion) are among the products that can be used.

SMALL GRAINS

STATE WHEAT YIELDS HIGHLY VARIABLE
By Don Hershman

Wheat yields and test weights have been highly variable in fields state-wide. In most cases, average to poor wheat yields are due to one or more unrelated factors:

Fields damaged by the early-spring freeze rebounded by initiating new tillers. In most cases, there were also tillers which were not killed. The result was that most fields had original and newly initiated tillers (in varying percentages) that flowered and matured at different times. Unseasonably hot weather occurred in late May and grain associated with late tillers was filling during this time. In contrast, most grain in original tillers had already reached maximum size by the time the hot weather hit. So, depending on the percentage of the grain that was filling during the hot weather, a field could have been little affected or the grain fill (manifested by both yield and test weight reductions) could have been significantly affected by the high temperatures.

Head scab was also a problem in some fields. I would classify 1998 as a moderate scab year, which means that some fields escaped damage, most had scab, but yields were not seriously affected; and some fields were hammered. You can tell whether grain was affected by scab by looking for "Tombstones" in the harvested grain. Head scab causes grain to appear shriveled and lighter (chalky) in color; sometimes affected kernels have a pinkish color. Kernels with these characteristics are known as tombstones. In contrast, kernels affected by high temperatures during grain fill will appear more or less normal, but will be very small. Initial data from a scab survey being conducted in Kentucky this year indicate that the average incidence of head scab was 12.3% (range was 0-46%). On average, infected heads had about 9% (range 0-23%) of their surface area diseased. However, when one considers all the heads in a field (both clean and those with head scab), the average field severity was 1.23% (range 0-6.3%). These data are preliminary since all of the data are not yet in. However, the levels of disease indicated coincide with my field observations this spring.

Finally, yields in many fields were significantly reduced by leaf and glume blotch and, sometimes, leaf rust where post-heading applications of Tilt were not applied. In some fields, powdery mildew was also a factor. Based upon what I saw, most fields that were sprayed after heading had acceptable levels of leaf and glume blotch and other foliar diseases. Our data from a foliar fungicide test on the Walnut Grove Farm in Logan County indicate the disease control and yield results when a single application of Tilt was applied just before the

onset of crop flowering and leaf and glume blotch was the main disease:

Treatment	Leaf blotch*	% Glume Blotch Incidence	Severity	Yield	Test Wt**
Non-treated	7.8b	100a	20.7b	38.3b	48.3b
Tilt (pre-flowering)	5.7a	100a	9.6a	45.7a	52.2a

* Scale of 1-9. A rating of 7.8 indicates significant involvement of the flag leaf; a rating of 5.7 indicates that, on average, leaf blotch did not involve the flag leaf and was restricted to subordinate leaves in the crop canopy.

**About half of the primary tillers in the field were killed by the spring freeze. Low yields and test weights reflect freeze damage and poor grain fill. Head scab was a minor factor in this test.

Plots were replicated six times; the letter following each value indicates if significant differences existed between the two treatments (P=0.05)

In addition to the above, there are many other possible reasons why yield and test weights might not be as good as expected in some fields. The take home message is consider all possibilities and take corrective action, when possible, next season. Planting date, variety selection, fertility, planting date, and location, for example, all had a profound effect on the level of freeze damage experienced. Some of these factors can be altered for next year, but you are stuck with location. Similarly, foliar fungicides applied in a timely manner can greatly reduce the impact of certain diseases, such as leaf rust or glume blotch, but will have little to no effect on head scab. In the end, you must assess where the weakness in the system were this season and make adjustments, where possible. However, there is no escaping an element of risk and the fact the some things will always be out of your control.

WATCH FOR SORGHUM MIDGE IN LATE PLANTED GRAIN SORGHUM (MILO)
By Doug Johnson

Late-planted grain sorghum is subject to large populations of sorghum midge. Additionally, other important factors in an outbreak of this pest are sequential planting and presence of Johnsongrass. Both of these factors allow sorghum midge populations to increase in number before they attack the flowering milo heads.

Midges may be present from about boot stage through the remainder of the season. However, only during bloom is the insect a threat. The midge must lay its eggs in the flower in order for damage to occur. At any other time it does not matter how many midges are about.

Sorghum midge is a very small fragile fly. This 1/8" long orange insect may be confused with winged aphids. However, most aphids will be black or dark green. Also, when winged aphids are found, colonies of un-winged individuals will also occur on the leaves. Sorghum midges do not produce such colonies.

Scout in the early morning hours before 10:00 am. Mid-day scouting will not work. Check twenty heads in each location as follows. Place a clear plastic bag over the head and shake the head. Carefully remove the bag. Examine the bag against a light background looking for the small orange flies. Check no fewer than five locations in each field.

If on average one or more midges are found per head an insecticide treatment should be considered. Recommended insecticides may be found in ENT-24.

FRUIT CROPS

MIDSUMMER FRUIT DISEASES ARE WIDESPREAD
By John Hartman

The following fruit crop diseases were observed on recent field trips to different parts of Kentucky:

Small fruits

* Grape - Black rot is appearing now as a fruit rot and a leaf spot. Infected fruits turn black, shrivel up and become mummified, while tiny black pycnidia, fruiting bodies of the fungus *Guignardia*, appear on the diseased fruits. Black rot also causes an angular brown leaf spot.
* Raspberry - Septoria leaf spot disease is causing

numerous small, angular, tan spots to develop on leaves.
* Strawberry - Scorch, leaf spot, and leaf blight, three different diseases of strawberry leaves, are appearing now. Scorch causes small, round purple spots, leaf spot causes somewhat larger purple spots with tan centers, while blight causes larger dead areas to develop.

Tree fruits
* Apple - Apple scab causes leaf spotting; in unsprayed trees, infected leaves are turning yellow and dropping to the ground in many locations. Cedar-apple rust is appearing as prominent yellow-orange spots on leaves of some apples. Frogeye leaf spot, the foliar phase of black rot, is also present. Sooty blotch is now appearing on apple fruits.
* Peach - Brown rot is causing a soft, brown decay of fruits on the tree and after harvest. Under moist conditions, the fungus *Monilinia* appears on the fruit surface as a brown, dusty mass of spores. Plums are also affected. Scab, appearing statewide as a dark greenish-black spotting of the fruit, is caused by the fungus *Cladosporium*.

SHADE TREES AND ORNAMENTALS

DOGWOOD SAWFLY
By Ric Bessin

We have received several reports of dogwood sawfly during the past week. The dogwood sawfly will take on several forms while in the larval form. As young larvae (late June-early July) they feed in groups and skeletonize leaves. As they grow, the larvae become covered with a white waxy coat and they disperse over the tree feeding on leaf margins. They eat the entire leaf, leaving only the midrib. The last instar is straw colored with numerous black spots along its body and can also cause some damage as it searches for an overwintering site. While they prefer to overwinter in rotting wood, they can also burrow into some types of composition siding.

Because sawfly larvae are not caterpillars, sprays containing *Bacillus thuringiensis* are not effective. Dogwood sawfly larvae can be controlled on dogwoods with sprays containing acephate (Orthene T&O), carbaryl, or cyfluthrin. There is one generation per year.

LANDSCAPE PLANT DISEASES ACTIVE NOW
By John Hartman

The following landscape plant diseases were observed in Kentucky on recent field trips and at the recently concluded Plant Health Care workshops:

Flowers
* New Guinea impatiens - Impatiens necrotic spot virus (or Tomato spotted wilt virus) was causing stunting, malformed leaves, and necrotic ring spots on leaves of New Guinea impatiens in an outdoor bed.
* Zinnia - Bacterial leaf spots caused by *Xanthomonas*, and fungal leaf spots caused by *Alternaria* are now appearing in flower beds and gardens. Many zinnias are also infected with powdery mildew.

Shrubs
* Azalea - Phytophthora root rot was causing foliage yellowing and twig and branch dieback in poorly drained shrub beds.
* Holly, 'China Girl' - Black root rot, caused by the fungus *Thielaviopsis basicola* caused leaf drop of recently planted hollies. The roots showed visible black lesions and blackened root tips.

Trees
* Dogwood - Powdery mildew, with its multifaceted symptom development - yellow older leaves, deformed new leaves, leaves with purple splotches and dead areas, and mildew signs on leaf surfaces - is again becoming serious.
* Flowering crabapple - Apple scab susceptible trees have spotted leaves which are turning yellow and dropping to the ground in many locations. Cedar-apple rust is appearing as prominent yellow-orange spots on leaves of some crabapples. Frogeye leaf spot, the foliar phase of black rot is also present.
* Maple - Verticillium wilt and abiotic problems

such as girdling roots are causing widespread dieback of maple trees in the landscape.

* Redbud - Botryosphaeria canker is appearing as individual dead branches in redbud trees. Close examination of the base of the dead limb or branch is a sunken area on the bark with stained cambium

and wood under the bark.

DIAGNOSTIC LAB-HIGHLIGHTS

By Julie Beale and Paul Bachi

A number of **soybean** diseases are being seen, including root/stem rot caused by **Rhizoctonia and Phytophthora, Diaporthe stem canker and brown spot (Septoria).**

On **tobacco,** we are continuing to see numerous cases of **black shank and soreshin (separately and in combination), Fusarium wilt, blue mold and transplant shock related problems**. In addition, this past week we began to see **target spot** in the field, **root knot nematode**, **bacterial hollow stalk, ozone damage, lightning damage and frenching.**

In the landscape, we are seeing **oedema** on **perennials** (phlox, coral bells) and **powdery mildew** on **dogwood**. Turfgrass diagnoses this week have included **brown patch** on **fescue** in lawns, **anthracnose** on **creeping bentgrass** (golf course) and **Pythium blight** on **ryegrass** (golf course).

Home fruit growers are frequently seeing **black rot** on **grape**. Collapse from spring **freeze injury** is occurring now on many fruit trees (and ornamentals), especially **peach and cherry**. **Septoria leaf spot** was diagnosed on **raspberry.**

On vegetables, we have seen **anthracnose, Rhizoctonia stem rot and root knot nematode** on **bean**; **black rot and bacterial soft rot** on **cabbage**; anthracnose and bacterial wilt on **cucumber** (wilt also on squash); and **early blight and bacterial spot, speck and wilt** on **tomato**.

INSECT TRAP COUNTS

July 2 - 10, Princeton

Southwestern Corn Borer	164
European Corn Borer	21
Corn Earworm	26
Fall Armyworm	3

Lee Townsend, Extension Entomologist