



KENTUCKY PEST NEWS

ENTOMOLOGY • PLANT PATHOLOGY • AGRONOMY

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TOBACCO

CURRENT BLUE MOLD STATUS

By William Nesmith

*BLUE MOLD WARNING: for SHELBY County in central Kentucky and CLAY County of southeastern Kentucky.

** BLUE MOLD ADVISORY: for all remaining counties in Kentucky.

SITUATION IN KENTUCKY: Weather conditions in most of Kentucky have not been conducive to support the general development of blue mold in the field, so I have greatly reduced the area under both warnings and watches. However, a statewide advisory exists, because conditions remain favorable for development in the transplant production systems, plus major intrastate movement of transplants is occurring about Kentucky. Some growers are reporting shortages of transplants due to extensive resetting of crops that died from transplant shock. It is anticipated that infected transplants are being set to the field and moving intrastate, but probably at a very low incidence of infection and below the level readily detected by the agricultural community.

Blue mold has been confirmed in Clay and Shelby counties of eastern and central Kentucky, respectively. These outbreaks are centered around

greenhouse operations and the setting of infected plants from those greenhouses to the field. These two sources presented SERIOUS THREATS of airborne spores on Tuesday night through Thursday morning, especially to nearby crops north or east of the sources. But a low level of viable spores may have moved as far away as southern Ohio, northeastern Kentucky, and western West Virginia. Infections resulting from this spore-release should be evident by June 10, so scout fields carefully. The growers involved in Shelby County conducted very aggressive spray programs last week, and some fields of systemically infected transplants were destroyed and reset, plus the remaining diseased greenhouse plants were destroyed promptly.

In Clay County, many transplants were destroyed and commercial distribution of the diseased transplants was voluntarily stopped by the grower. However, some plants had already been set and others will be from the greenhouses involved. Since County Extension Agents in neighboring counties that received plants from this operation have not reported finding blue mold a week after notification, the warning area was reduced to include only Clay County, considering the dry conditions experienced in the region.

Blue mold outbreaks in the field should be directly related to the setting of infected transplants, with minimal secondary spread. Field conditions have

just been too dry and sunny to support much secondary (airborne) spread within and between fields, except near diseased transplants. Be especially watchful of situation with field plantings located adjacent to transplant operations.

CONTROL TIPS:

Continued action is still needed for growers near (within five miles), and north or east of the plantings involved in Clay or Shelby counties, or anywhere else that active blue mold is present. Growers in those communities have been advised to make three applications of Acrobat MZ at five day intervals, even during this dry weather, in order to get these localized epidemics under control. Dry weather will greatly reduce blue mold spread, but it will take multiple fungicide applications to get it under control where outbreaks are already under way.

Efforts should continue to: Avoid introduction with transplants (intrastate movement of Kentucky produced transplants is risky); keep transplant sites protected with fungicides until through transplanting; promptly destroy all transplants once transplanting is over, lest they become sites to harbor buildup; remain alert to changing blue mold situations; and, start spraying fungicides in warning and watch areas and be prepared to make immediate field fungicide applications in the advisory areas should the status change. If the levels of blue mold being reported to the Kentucky Blue Mold Warning System are accurate, it is highly unlikely that a major outbreak of blue mold could develop until a major change in weather occurs - a return to cool and wet weather.

EARLY-SEASON FIELD PROBLEMS AND TRANSPLANT SHOCK

By William Nesmith

Several County Extension Agents report they have basically two situations with fields already set - Good and Bad. Most of the problems being reported relate to abiotic factors (centered around transplant shock and dry soil conditions), rather than infectious diseases. However, several infectious diseases are active and causing serious problems for some.

Where infectious diseases are involved, three factors are mainly driving the situation:

* Setting of plants already infected with the

pathogens;

* Setting of susceptible varieties into sites where high levels of the pathogens await them in non-rotated land;

* or, weak plants being attacked by weak parasites.

Setting Pythium infected transplants-

Pythium has been very active in float beds in some areas this year, especially of late, as it has in recent years. We have generally not had the type of weather where Pythium directly kills plants in the field, like the past three seasons, due to inadequate moisture. Instead, plants with Pythium rotted roots just do not have adequate root systems to keep up with the water demands from high evapotranspiration and they die of transplant shock before developing secondary roots. This is not unlike what is happening with immature plants, however, it is just a different cause. Under this year's dry condition, using Ridomil Gold in the field has not helped very much in Pythium control. Ridomil Gold used in the field helps with preventing serious soft rot, damping off, and root rot development during wet periods.

Unfortunately, some have the misconception, developed over the past three years of wet springs, that if they can just get them set into the field treated with Ridomil Gold and out of the water, the problems are over. A better concept to have is: "you reap what you sow", especially when setting plants with dead roots into dry soils in dry weather!

*** Rhizoctonia/soreshin moving in to finish-off the plants**

Most tobacco sites have an abundant population of the Rhizoctonia fungus. Once plants are weakened, this fungus often attacks the roots and lower stem causing soreshin. Plants may die a slow death of several weeks in dry weather, or when rains come, they re-root above the lesion and grow slowly. Transplants that have soreshin or target spots in the beds are likely to experience soreshin in the field at an even higher rate than others. The extent of soreshin in the field in Kentucky is usually related to the amount of stress in the field, however. Where infected plants are set into dry soils, or compacted soils serious loss may occur shortly after transplanting. We also often see problems when the root system is set into the herbicide treated zone, resulting from either setting too shallow or from incorporating the herbicide too deeply. But, the field problem may not show up until the heat of July, when it often gets confused with black shank.

Black shank in a black shank resistant variety.

Several County Agents have already report strong black shank activity, often with the questions: "Why early? Why even with resistant varieties? Most of this is in non-rotated sites with a history of black shank. We have observed over the past several years serious failures in black shank control in black shank-infested fields, even with resistant varieties and Ridomil or Ridomil Gold, where the transplants used had problems with Pythium, soreshin or target spot. So, diseased transplants are part of the problem. We are not sure what happens in these cases, but most likely one or more of following is occurring: The diseased plants are unable to adequately develop their black shank resistance, roots damaged from other diseases are unable to pick up adequate fungicide, or the diseased sites serve as invasion sites for the black shank fungus.

Black root rot.

Where varieties with low to medium resistance to black root rot have been set into non-rotated fields, black root rot is often very active. Plants appear stunted. This problem is more obvious in the early set crop, because cool soils favor development and it takes several weeks for the symptoms to become evident.

BUDWORM BATTLES - WILL THEY BE BACK?

By Lee Townsend

Some serious budworm infestations were found in early July of last year with less than acceptable control in the eyes of the growers. Problem fields were transplanted in the May 28 - June 2 time frame. Nearby or adjacent fields set about 3 weeks later were clean, indicating that they missed the moth flight.

It is wise to anticipate budworms in the earliest set fields this year. Field checks are necessary to detect budworm activity and to time an insecticide application properly. Carefully examine the bud area of groups of 10 plants in 5 different areas of the field. Look carefully in the bud for small holes in the leaves, young budworms, and their pepper-like droppings. An insecticide should be applied if a total of 5 or more budworms are found per 50 plants.

Keys to effective budworm control.

☞ Early detection - this catches larvae before they have done most of their feeding damage.

☞ Good coverage of the bud area with 30 gallons or more of finished spray per acre. This will help to get the product to the pest.

☞ Use hollow cone nozzles placed directly over the row. Additional nozzles on 6" drops and angled in from the side will improve coverage, as well.

☞ Be sure the bud leaves are open when the field is sprayed. Bud leaves will close over to protect the bud during very hot periods. Bud closure will keep the treatment from reaching the target.

☞ Check back in about 48 hours to evaluate the degree of control achieved. Anything over 70% should be considered good. Research trials last year showed Orthene (Acephate) and Tracer to be effective in properly timed sprays with good coverage. Thiodan (Golden Leaf Tobacco Spray) was not as effective against this insect.

☞ Budworm checks now also will allow a look at the build up of tobacco aphids. These insects generally begin to build at about 4 weeks after transplant.

CORN

CORN INSECT UPDATE

By Ric Bessin

As the summer begins to heat up, so does the insect pressure in corn. We are still receiving a few reports of cutworm activity in late planted corn. With the dry conditions this year, much of the cutting has been below the soil surface. However, as corn continues to grow past the 18" stage, it outgrows the ability of the cutworms to do damage. Until plants reach this stage, corn should be scouted for cutworms at least twice a week.

Reports of European corn borer activity are increasing. Moth flights have been intense in parts of the state. Generally, it is thought that the single most important factor that can reduce European corn borer infestations is the occurrence of severe weather during the spring moth flight. Conditions this year during moth flight, mating and egg laying were favorable for this insect. Corn producers should monitor fields for this pest weekly and use the following table to make control decisions.

Growth stage	Percentage infested plants				
	40%	50%	60%	70%	80%
Early whorl	4.9	6.5	8.3	10.3	12.6
Late whorl	3.9	5.2	6.6	8.3	10.1
Pretassel	5.9	5.2	10.0	12.4	15.0
Pollen shed	3.9	5.2	6.6	8.3	10.1
Kernels initiated	2.7	3.6	4.5	5.6	6.9

This table allows the use of (1) % infested plants found by field scouting, (2) anticipated yield from the field (bu/a), (3) crop value (\$/bu) and (4) the control cost (\$/a for insecticide + application cost) to make control decisions. See ENT-49 for an example using this table.

While all Bt-corn hybrids are highly resistant to attack by the first generation of European corn borer, producers need to monitor these fields, as well as refuge areas.

Reports counties using Southwestern corn borer traps indicate that there is a strong moth flight underway in some western counties. Once regarded as the worst insect pest attacking corn in Kentucky, the Southwestern corn borer has been rebounding in the western portion of the state, particularly in counties along the Mississippi River and Ohio River west of Owensboro. While the damage caused by the first generation is very similar to that caused by the European corn borer, fall damage to late planted corn can cause severe lodging and harvest losses.

During the next few weeks, producers should monitor their corn for this pest. While damage is similar to European corn borer, the treatment threshold is lower. An insecticide is recommended for control if 35% of the plants are infested and live larvae are found in the whorl. See ENT-16 for a list of insecticides recommended for control of Southwestern corn borer.

WHEAT

WHEAT DISEASE UPDATE

By Don Hershman

This has been a somewhat unusual year for wheat from a disease perspective. Environment represents one-third of the disease triangle and the mild fall and winter followed by a long, cool, but mostly dry spring has certainly impacted disease development

in wheat. By the same token, warm, humid weather as of late has also significantly affected late season disease development.

Powdery Mildew:

This disease has recently built up in susceptible varieties in some areas, but levels have been significantly below normal. Mild winter conditions probably allowed the powdery mildew fungus to become active in late winter and, I suspect, one of our famous late winter cold snaps reduced levels of the fungus in what had been actively growing leaf tissue. The end result was that the local powdery mildew epidemics were likely delayed until sufficient powdery mildew inoculum returned to critical levels in mid- to late-May.

Leaf Rust:

Leaf rust levels were lower than normal during most of the season and then exploded during the last three weeks in susceptible varieties that had not been treated during heading with Tilt or Quadris. Rust activity is even high in the Bluegrass Area, which itself is unusual. Fungicide-treated fields are generally free of leaf rust, but as the crop matures, even those fields will show evidence of increased leaf rust activity. This increase in rust will occur as fungicide active ingredient “runs out” and is no longer able to protect the crop from new rust infections.

Speckled Leaf Blotch:

As I indicated in a previous KPN article, levels of this disease have been much greater than normal. Most of the “firing up” of leaves in the lower canopy in most fields is due to the effects of this disease before fungicides were applied. Resistance to the causal fungus, *Septoria tritici* is, at best, weak so nearly all fields are showing significant disease. I have even seen a few non-fungicide-treated fields where the disease has nearly destroyed the flag leaves of most plants. Prior to this year, I had not experienced such highly destructive episodes of speckled leaf blotch in Kentucky. Nonetheless, fungicides and warmer, dry weather through mid-May have limited the development of the disease on flag leaves in most fields.

Stagonospora Leaf and Glume Blotch:

Leaf blotch levels have been exceptionally low so far this season. Glume blotch, however, is quite common, albeit not as severe as usual in most fields. Normally, there is fairly close linkage between the levels of leaf blotch and glume blotch in a field, but not this year. Apparently spores of *Stagonospora nodorum* are blowing in from some local or distant source; I just do not see the evidence that splash-borne inoculum is a significant factor this year like it is during most seasons.

Tan Spot:

This has not been a banner year for tan spot and levels are just now beginning to build in some fields. Damage should be light because of the lateness of infections.

Take All:

Generally, take-all disease is not a serious problem in Kentucky. Crop rotation to corn and soybean tends to do a good job of limiting the extent of the disease. This year is no exception, but there was definitely a much greater incidence of take-all occurring as small clumps of take-all-affected plants in many fields this year. Although not enough to cause much yield damage, there is enough to indicate that potential for take-all problems are just one crop year away if a field is not rotated properly.

Barley Yellow Dwarf:

Barley yellow dwarf (BYD) started to show up in many fields around late flag leaf emergence to early heading stages. In some fields disease is extensive. However, levels have been moderated somewhat, statewide, because most farmers did not plant their wheat early (early planting predisposes fields to BYD) in the fall and/or the use of insecticides during late fall to early winter.

Fusarium Head Blight (Head Scab):

It appears as though most of the wheat and barley in the state has dodged the Fusarium head blight (FHB) bullet this season. Why? I suspect most fields escaped serious FHB damage because the crops flowered during dry conditions (both in terms of humidity and rainfall). This lack of moisture during the most FHB-susceptible period for the crop probably reduced both spore release of the

fungus from infested crop residue and infection of heads by the FHB fungi. There is definitely more FHB the further north you look, which suggests a greater overlap between crop flowering and disease-favorable conditions.

PREPARING BINS FOR SMALL GRAIN STORAGE

By Doug Johnson

Time is short. Most of the corn planting is done but beans are still going into the ground and it's about time to side dress early-planted fields. Production practices just never seem to let up this time of year. Small grain harvest is not far off, and many producers will decide to keep that crop in their on-farm bins at least for a short time. Making sure you have provided a safe storage for your already made yield is just as important as all the practices that go into producing the crop.

The number one Law of Grain Storage is: Put clean, dry grain in clean, dry bins. It seems so simple, yet as always, the devil is in the details. The grain may come out of the field clean but what was in your combine, trucks, auger and bins? Any place that last year's grain can be found is a place that grain destroying insects can be found.

A good overview of preparing a bin for storage as already been published in this newsletter (KPN (#848) 24 May 99). This article, *Economical Wheat Storage Tips*, by Sam McNeill may also be found on the web at:

http://www.uky.edu/Agriculture/kpn/kpn_99/pn990524.htm#wheeco

You can also get grain storage tips from Ent-19, *Controlling Insects in Stored Grain*.

One of the most often asked questions about stored grain is "What insecticides can I use to treat the grain?". Options for treating stored grain are found in the individual crop insecticide recommendations, in this case ENT-47, *Insecticide Recommendations for Small Grains*. However, an insecticide application will not prevent all your problems. More importantly, such an application will not overcome established applications in improperly prepared bins. Additionally, because this crop is stored during the hottest, most humid part of the year, it is questionable that insecticides applied at binning will provide more than a few weeks protection. Under these conditions insecticides will break down very rapidly.

Once the grain is safely in appropriate storage, there is no replacement for checking on the grain once in a while. Although, insects and diseases can cause considerable problems inside bins, it really more likely that spoilage will result from excess water. This may result from a leak in the bin or from poor temperature management. Whatever the reason, often the simple use of eyes and nose at the bin hatch can save many a bushel. As always, NEVER go into a bin without a second person to help and other precautions. Bins may be common but they are dangerous.

SHADE TREES AND ORNAMENTALS

MULCHES, MUSHROOMS AND MOLDS

By John Hartman

Mulches are used in Kentucky gardens and landscapes for many reasons. By suppressing vegetation near trees and shrubs, they keep mowers and string trimmers from damaging the bark. In landscape beds and in the garden, they control weeds, improve drainage, prevent soil water loss, lower soil temperatures, prevent soil erosion and, as they decompose they release minerals and leave behind humus which benefits the plants. Organic mulches generally suppress plant pathogenic fungi and enhance beneficial mycorrhizal fungi. For continuing benefits, mulches need to be reapplied periodically.

Based on recent calls and inquiries, there seems to be a concern about nuisance fungi growing from mulch applied to landscape plants. There are many examples of fungi that grow on or from landscape mulch. Examples include stinkhorns (*Mutinus* and other related species), bird's nest fungus (*Crucibularium*), earth stars (*Geastrum spp*), assorted toadstools, slime molds (*Physarum* and other species), and the shotgun, or artillery fungus (*Sphaerobolus*). Of these, only the shotgun fungus is truly a nuisance because it shoots tiny black spore masses onto nearby surfaces such as home siding and cars. Fungi also permeate thick layers of dry mulch, creating a hydrophobic mulch which is not easily penetrated by water, thus causing irrigation problems. Fertility problems can result when the fungi decomposing mulch remove from the soil, nitrogen needed by the plants.

Can mulches transmit plant diseases? The fungi that cause Verticillium wilt and Phytophthora root

rot can be carried in fresh mulch, but would not be a problem in composted mulch. Similarly, although the Rhizoctonia root rot fungus can use mulch as a food base before causing damping-off of seedling plants, it can be destroyed by six weeks of composting where mulch reaches 130-160 degrees F. Most organic mulches do not contain plant pathogens. Beneficial mycorrhizal fungi are active in shallow (1-2") layers of mulch, but are inhibited by deep mulch layers (4-6").

With proper manipulation, mulches can be prevented from developing nuisance fungi while maintaining the benefits of mulch. Much work on microbes and mulch has been done in the laboratory of Dr. Harry Hoitink at Ohio State University. They have found that hardwood bark mulches (most commonly used in Kentucky), especially if finely ground, contain a large amount of cellulose which decomposes fairly rapidly and leads to nuisance fungi. Such mulches, if composted for a few weeks with added nitrogen, and maintained at moisture levels over 40% will not develop nuisance fungi. Such moisture levels allow bacteria and other fungi to compete with the nuisance molds. Moisture contents of organic products up to 50% will not present excessive transport weight problems.

The following are suggestions for the landscape industry and for homeowners wishing to avoid nuisance fungi:

- Purchase composted mulch products.
- Use mulches low in wood and high in bark.
- Avoid finely ground woody products unless composted first.
- If using fresh wood chips such as those from a tree maintenance firm, add water to the mulch and allow the pile to partially compost for six weeks. If the wood chips do not include fresh leaves, add some nitrogen to speed composting.
- Use coarse mulches, but do not apply them too deep.
- Soak all mulches with water immediately after application to enhance bacterial colonization.
- Do not apply mulch deeper than two inches.
- Do not use sour mulches (highly acidic mulches giving off an acrid odor) because they injure plants.

JUMPING OAK GALLS AND OTHER PERPLEXING LEAF GROWTHS

By Lee Townsend

Galls are caused by chemicals with plant growth regulating properties which are released by a variety of insects and mites. Proteins in the walls of these structures provide food, the structure itself provides protection. While galls may be somewhat unsightly, few affect tree health. Also, there is often only sketchy information on the biology of the gall maker and no good idea on when to time the preventive treatment needed to reduce gall numbers.

Jumping oak galls (see Diagnostic Lab Highlights) are small, globular seed-like growths on the undersides of some oaks. Mature galls drop to the ground. Movement of the small insect inside the gall can cause the gall to “hop around”. A picture of the gall can be found on page 441 of Insects that feed on trees and shrubs by Johnson and Lyons (2nd Edition) . Entfacts 403, 404, and 408 deal with common galls.

HOUSEHOLD

WOODS COCKROACHES - TEMPORARY INVADERS

By Lee Townsend

Woods cockroaches are common household invaders during early summer, especially near wooded areas. The most common species found in Kentucky is about 1 inch long with a dark brown body and wings. The margins of the front wings are edged with white.

Male woods cockroaches are excellent fliers, and both sexes are attracted to lights. They are drawn to outdoor lights and will enter homes and buildings as accidental invaders but will not become established.

These are primarily outdoor roaches, living beneath loose bark in woodpiles, fallen logs, and dead trees. They cannot survive indoors, but can be an annoyance during the spring when large numbers accidentally wander in from outside. Large numbers of woods cockroaches are sometimes found nesting in rain gutters and crawl spaces. Individual invaders can be dispatched as needed, there is no effective control other than exclusion. Keep window screens intact and be sure door sweeps fit tightly.

DIAGNOSTIC LAB-HIGHLIGHTS

By Julie Beale

Problems on corn last week included damage from soil compaction and stress and symptoms of zinc deficiency. Lepto leaf spot was diagnosed on alfalfa.

On tobacco we diagnosed black root rot, Pythium root rot, target spot, black shank, tomato spotted wilt virus, as well as herbicide damage and transplant shock. This year's first cases of blue mold in Kentucky were found last week (two counties confirmed).

On fruits we have seen still more fireblight (apple and pear), cedar-apple rust on apple, orange rust on blackberry and frog-eye on apple. On vegetables we have seen bacterial spot on pepper, bacterial spot, early blight and Sclerotinia stem rot on tomato, and growth regulator damage on many different vegetable crops.

On ornamentals we have seen Pythium blackleg and Xanthomonas bacterial blight on geranium, rust on fescue, powdery mildew on honeysuckle, and Dutch elm disease on American elm. There are reports of numerous cases of jumping oak gall in western Kentucky.

INSECT TRAP COUNTS

UKREC, Princeton, KY, May 14-21

European corn borer	2
Black cutworm	3
True armyworm	5
Southwestern corn borer	24

Lexington, May 30-June 7

Black cutworm	0
European corn borer	5
Fall armyworm	0
Corn earworm	6
Diamondback moth	6
Cabbage looper	0
Beet armyworm	13
Squash vine borer	0

Lee Townsend, Extension Entomologist