



# KENTUCKY PEST NEWS

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## CORN

### FALL ARMYWORM

by Ric Bessin

As we are approaching tassel emergence in some early-planted corn fields in the western part of the state, fall armyworm is beginning to be detected infesting whorl stage corn. Although these infestations were far below economic thresholds for treatment, producers should begin to monitor for this pest. Fall armyworm can be one of the more difficult insect pests to control in field corn. Late planted fields and later maturing hybrids are more likely to become infested.

Fall armyworm causes serious leaf feeding damage, as well as direct injury to the ear. While fall armyworms can damage corn plants in nearly all stages of development, they will concentrate on later plantings that have not yet silked. Like European corn borer, fall armyworm can only be effectively controlled while the larvae are small. So early detection and proper timing of an insecticide application are critical.

Fall armyworms vary from light tan to black with

three light yellow stripes down the back. There is a wider, dark stripe and a wavy yellow-red blotched stripe on each side. Four dark spots, arranged in a square, can be seen on the top of the eighth abdominal segment.

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

Larger fall armyworm larvae consume a lot of leaf tissue, resulting in a ragged appearance to the leaves similar to grasshopper damage. Larger larvae are usually found deep in the whorl often below a "plug" of yellowish brown frass. Beneath this plug, larvae are protected somewhat from insecticide applications. Plants often recover from whorl damage without any reduction in yield. However, larvae will also move to the ear as plants begin to tassel and young ears become available. The ear may be partly or totally destroyed. Damage to the ear may be much more important than leaf damage.

For more IPM information, see ENTFACT 110, *Fall Armyworm*. See ENT-16, *Insecticide recommendations for Field Corn* for control recommendations.

## **BORER UPDATE CORN**

**by Ric Bessin**

European corn borer levels are highly variable among fields. Some producers in the western part of the state have reported early-planted fields with treatable infestations. However, the worst infestations have been reported in sweet corn. Because European corn borer is so highly variable among fields, producers are advised to monitor each field in order to make corn borer management decisions.

Producers also should begin to monitor for first generation southwestern corn borer. Strong moth flights last week in some western Kentucky counties indicate that they should be about two to three weeks behind European corn borers. For more information, see ENTFACT 108, *Southwestern Corn Borer*.

## **TIPS FOR POSTEMERGENCE HERBICIDE APPLICATIONS IN CORN AND SOYBEANS**

**by J. D. Green**

When postemergence herbicide applications are used as part of a weed management program the type and size of weeds present, crop growth stage, interactions of the herbicide with the environment, and several other factors, need to be considered. Some of the most important ones are highlighted below.

1) Timing of the herbicide application. Applying the herbicide treatment at the right time is just as important as picking the right herbicide or combination of herbicides to use. Scout the field to determine the type and size of weeds that are present. Look for the density and distribution of the weeds present. In general, optimum weed control is obtained with postemergence herbicides when weeds are small and actively growing. Larger weeds can be much more difficult to control.

2) Choosing the herbicide. The most effective herbicide product(s) to use will depend on the type and size of weeds present. Also, the size or stage of crop growth may limit the use of some herbicide products.

3) Tank mixtures. When tank mixing two or more herbicides together to make one application, make certain that the herbicides are compatible within the spray tank or they do not cause antagonism. Antagonism between herbicide products can reduce the effectiveness of one or more of the herbicides applied. In some cases, such as for the control of both grasses and broadleaf weeds in a field, a sequential application 7 to 10 days apart often provide the best results. Risk of crop injury may also be increased when certain herbicides are applied as a tank mixture.

4) Application Rate. The application rate for the herbicides used also depends on the type and size of weeds present, the tank mixture used, and/or the stage of crop growth. The spray volume (or gallons per acre) may need to be altered depending on the herbicide products used.

5) Use of additives. Additives such as a non-ionic surfactant or crop oil are often used with many postemergence herbicide products to improve their penetration through the leaf surface and/or to serve as a spreader. A liquid nitrogen fertilizer solution is sometimes recommended in addition to surfactant or crop oil to improve the activity for certain weeds such as velvetleaf. Choosing the right additive for the spray tank can sometimes create a lot of confusion. Consult the herbicide label to select the right additive for the herbicide or herbicide combination to be used.

6) Environmental conditions. Weeds that are stressed due to hot/dry weather can be harder to kill. Also, crops under stress have a greater potential for herbicide injury with some products. Other extremes in environmental conditions, such as wet field conditions can prevent applications from being made on a timely basis. Expected rainfall soon after application can wash the herbicide off the plant; thus, reducing its effectiveness. The rain free period suggested for many products range from 1 to 8 hours, depending on the herbicide.

7) Drift and nearby susceptible plants. As a rule, avoid applications when wind speed exceeds 10 MPH or temperatures are above 85 F. Under these conditions the potential risk of herbicide injury to nearby susceptible plants is greatly increased due to volatility and/or drift from certain herbicides.

8) Sprayer cleanup. The spray equipment should be thoroughly rinsed and cleaned immediately following a herbicide application. This includes flushing the tank, hoses, screens, and nozzles with clean water. In some cases running a cleaning solution, such as household ammonia, through the system is needed. Many of the herbicide labels discuss proper sprayer cleanup after use of a product. Sprayer cleanup is critically important when applying a herbicide on one crop and using the same equipment to treat another crop.

In summary, postemergence herbicide applications can be an effective tool for managing some weed problems. Choosing the right time for the application is just as important as choosing the right herbicide or herbicide combination. Finally, be aware of environmental conditions before and after making a postemergence herbicide application.

## ALFALFA

### POTATO LEAFHOPPER CONTROL FOR SPRING-SEEDED FIELDS

by Lee Townsend

This is a critical time to check for potato leafhoppers (PLH) in fall- or spring-seeded fields. A 15" diameter sweep net is needed to get an accurate picture of field infestations. You may be able to borrow one of these from your county extension agent for agriculture. Treatment guidelines are based on plant height and the average number of leafhoppers per sweep (or total per 100 sweeps). See ENT-17, Insecticide Recommendations for Alfalfa, Clover and Pastures- 1998.

A June 12 check of a Fayette county alfalfa field seeded in mid-May produced 55 PLH per 100 sweeps. This is right at the treatment threshold for PLH considering the 3.5" to 4" tall plants in the field. There was no sign of hopperburn or stunting but these are sure to develop if nothing is done because it is a long time until harvest.

All of the leafhoppers in the sweep samples were adults but nymphs will be present soon. Sap feeding by both nymphs and adults produces the wedge-shaped yellow tip on alfalfa leaves and can cause stunted plants.

The following table presents data from forage entomology research specialist John Parr's 1997

insecticide evaluation plots. The percent control figures in columns representing days after treatment are calculated based on the reduction in numbers of leafhopper per sweep in treated and control plots for that date.

Comparable performance would be expected from Pounce and Ambush (not in the trial). Warrior has been very good against PLH in previous trials but was not included in the 1997 test.

Product	Rate per acre	Per cent control		
		Days after	10	14
Baythroid	1.6 fl oz	92	70	37
Pounce	6 fl oz	86	64	49
Pounce	8 fl oz	81	62	21
Cygon	½ pt	58	18	3

Except for Cygon (dimethoate), all of these products reduced PLH numbers by more than 90% during the first 7 days of the test. Cygon may be used at up to 1 pt per acre and a higher rate would be expected to provide better control.

#### Potato leafhoppers on the second and third cuttings

With the high initial leafhopper numbers in the state, regrowth following the first and second cuttings from established fields should be monitored. The critical time period for this is 10 to 14 days after harvest. If leafhoppers are at or above treatment guidelines at this point, a prompt treatment is needed. If an insecticide application is applied more than 14 days after harvest, it is unlikely to prevent a loss in hay quality because the damage has been done already.

## TOBACCO

### CURRENT BLUE MOLD STATUS

by William Nesmith

Blue mold activity continues to increase in western, southern, and central Kentucky, with the level of activity being highly variable. County Extension Agents report greatest damage is to transplant production, especially damaging to traditional beds still under cover where little preventive fungicide has been used. They indicate that most damaging

field outbreaks are traceable to setting of infected transplants. Weather conditions during the past 10 days have been highly favorable to support rapid spread and development and have greatly complicated spraying activities.

Dr. Bill Maysymowicz, Extension UK Tobacco Specialist located at the Research and Education Center in Princeton, stated that blue mold is probably much more widespread and potentially damaging in western Kentucky than is being estimated. He said: " I do not want to be an alarmist about this, but too many (with both burley and dark) are underestimating the potential impact of what blue mold can do, now and later in the season, with it so strongly established this early in the season. Although a lot of direct damage may not have occurred yet, the disease's potential to damage is great. Furthermore, most are not appreciative of the importance this extra element of time brings. First, the contribution of systemic blue mold has been grossly underestimated. It is going systemic in dark and we have almost no experience with systemic blue mold in dark tobacco. Also, people want to stop worrying about blue mold when a day or two of hot, sunny weather appears rather than using that time to catch up and get everything sprayed well."

The least blue mold activity so far this season is in central, northern and eastern Kentucky, the three regions hit hardest the past three years with blue mold. Although this pattern is in part related to luck of weather and other circumstances, County Extension Agents report more widespread and timely use of fungicides in transplant operations in these regions than normal. Growers have responded to control recommendations for local transplant production and regular fungicide programs in transplant systems. However, even in these regions, there is still a large number of growers doing nothing to prevent blue mold.

Foliar fungicide use in the field is low statewide, according to County Agents. In part, this is due to wet field conditions, but in too many cases direct management decisions have been made to not start spraying fungicides in the field until other timely farming operations have been completed. In several cases, this delay will cost the growers half the yield potential, because blue mold is going systemic when some timely sprays could have prevented this loss. Several County Agents report considerable

disappointment in trying to cope with advising growers about this situation. Most growers just do not believe there is a need to spray until the level of blue mold activity is high in the community. Several agents have indicated that growers have just not accepted the idea that foliar fungicides must be used preventively to control blue mold. Many growers feel this is a sales gimmick, and are not convinced by research data. Others indicated there is just too much hard work and cost to the foliar fungicide approach. Still others, claim they just cannot fit foliar spraying into the many other things they must get done at this time of year. The bottom line is that routine fungicide application in fields is basically not occurring, except on a few individual farms.

Laboratory tests indicate the blue mold operating in Kentucky is resistant to the active ingredients in Ridomil and Ridomil Gold, but very sensitive to dimethomorph, a component in Acrobat MZ. Earlier, we had reported that the isolates from Estill Co. were metalaxyl sensitive, but with time, these isolate proved resistant to Ridomil. It just took the fungus about 12 days to develop on the treated material. However, in repeat tests with the spores collected from the metalaxyl-treated tissues, the Estill Co. isolates showed resistance to Ridomil within 6 days.

Foliar fungicide spray programs should be maintained at five-day intervals in all transplant production systems in the state. Field sprays should be started in all counties with active blue mold, as well as in neighboring counties. With the number of unknowns involved, spraying of newly set fields throughout the state, irrespective of how close they are to known sources, is reasonable and prudent at this stage of the season. Acrobat MZ @ 2.5 lbs/100 gallons and Dithane DF @ 1.5-2.0 lbs/100 gallons are the two fungicides labeled for field use in Kentucky. The volume should be adjusted for crop stage with Acrobat MZ. Good coverage of the entire plant's foliage, stem, and bud is critical with both fungicides. Excellent coverage is achievable with high-pressure sprayers equipped with hollow-cone nozzles on drops. However, while the tobacco is small, good coverage may be possible with less sophisticated spray equipment. Failure to apply these fungicides correctly will result in little control and high input costs. In contrast, a very high level of control is possible with proper application of Acrobat MZ and moderate control is possible

with Dithane DF. However, economic benefit is not achievable with foliar fungicides in crops with low yield potential, because of the high input costs associated with frequent foliar fungicide applications.

BLUE MOLD WATCH EXISTS STATEWIDE AND WARNING exists for the following State Extension Areas: Purchase, Pennyrile, Green River, Mammoth Cave, Lake Cumberland, Lincoln Trail, and Fort Harrod. Blue mold has been confirmed in the following Extension Areas/Counties:

PURCHASE AREA: Calloway and Graves

PENNYRILE AREA: Caldwell, Christian, Muhlenberg and Todd.

GREEN RIVER AREA: Daviess, Hancock, Henderson, McLean, Ohio, and Webster

MAMMOTH CAVE AREA: Allen, Barren, Logan, Monroe, Simpson, and Warren.

LAKE CUMBERLAND AREA: Casey, Cumberland, Pulaski, Taylor, and Wayne.

LINCOLN TRAIL AREA: Hardin and Washington

FT. HARROD AREA: Jessamine and Lincoln

BLUEGRASS AREA: Clark, Estill, and Fayette.

LOUISVILLE AREA: none

NORTHERN KY AREA: none

LICKING RIVER AREA: none

NORTHEAST KY AREA: none

QUICKSAND AREA: none

WILDERNESS TRAIL AREA: none

## **TOBACCO INSECT ACTIVITY**

**By Lee Townsend**

A newly hatched tobacco hornworm was seen on tobacco on June 16. No moths have been caught in baited traps yet. This pale white caterpillar was about 1/8" long- about as long as its slender black tail. The first brood of the tobacco hornworm is usually light, when compared to the late summer brood, but can be very destructive to small plants. In addition, the first few colonies of tobacco aphids were seen on plants that have been in the field about 4 weeks. This is the time to begin checking fields if you are using a foliar spray program for aphid control. If you are using the Admire program, the weekly checks are just as necessary, but the target is the hornworm, and eventually the budworm.

## **SMALL GRAINS**

### **PREPARING TO STORE YOUR SMALL GRAINS**

**by Doug Johnson**

Harborage Sites - Thorough sanitation is the foundation upon which a sound stored grain insect management program must be built. In many cases, severe infestations in grain bins develop from a small number of pests that are able to live in grain handling equipment or in and around the storage facilities. A thorough pre-harvest sanitation program can reduce or eliminate these sources. The consequences of not cleaning up these infestations may not be seen until later in the storage cycle, after the insect population increases. The economic effects of poor pre-binning sanitation may include kernel destruction, commodity contamination, moisture and temperature problems resulting from the insect's metabolic processes, or structural damage to the bin due to heat and moisture buildup, not to mention the pesticide application to, or total loss of the grain.

Insect harborage sites may be classified as internal and external with reference to the bin facilities. Internal harborage sites include grain residues on the bin floor, accumulations of grain clinging to bin walls, and the fines and kernels which build up beneath the bin floor and in the duct work of the drying system. The obvious, visible accumulations in the bin should be cleaned thoroughly when the bin is emptied. Accumulations beneath perforated floors must not be overlooked. Often, floor construction makes thorough cleaning difficult and the use of vacuum hoses is helpful. Treatment of the floor void area with a fumigant may have to substitute for cleaning in some situations. Use of long handled brooms and shovels may be sufficient to clean out the bin area itself. Very thorough cleaning is necessary to reduce the likelihood of infestation. Properly dispose of grain and debris collected in the cleaning process. Insecticides for treatment of the empty bins are listed at the end of ENT-47.

External harborage sites is a broad category that includes sites around the bin that can contain small numbers of stored grain insect pests. Spillage near the auger, grain residues in harvesting equipment and structures used to store animal feed are

potential pest sources. Auger pits are particularly important sources of infestation. These areas must be watched carefully and kept clean. A comparatively small amount of spilled grain can provide enough insects to produce a serious infestation in stored grain.

Grain Quality - What you put into the bins is also an important consideration. Most stored grain insects feed on broken kernels and fines. Handling grain to avoid this will help protect the stored crop. Another major consideration is moisture of the grain. Sometimes, producers harvest a bit on the high moisture side to try to get those beans in early. If this is part of your operation, be aware that any storage moisture above 12.5% increase all storage problems including insects.

Insecticide Treatments - Insecticides labeled for use as small grain protectants may be found at the end of ENT-47. They should not be considered as the first line of protection for this commodity. Unlike corn, small grains are stored through the hottest and most humid time of the year. Temperatures inside storage bins during the time period will result in rapid destruction of the insecticide, resulting in protection for a very short period. Also, be aware that if you are selling directly to a food processor they may not allow any insecticide residue on the grain even if it is a legal product!

The most important step you can take: Store clean dry grain, in clean dry bins!

## VEGETABLES

### **THEY'RE BACK, BEET ARMYWORM MOTHS** by Ric Bessin

Last week, beet armyworm moths were captured in pheromone traps maintained by USDA APHIS Veterinary Service surveyors in four western Kentucky counties. A total of 12 moths were captured in four traps located in McLean, Hopkins, Henderson, and Union counties. These pheromone trap captures are significant for two reasons. First, beet armyworm has been a sporadic but serious pest of peppers and tomatoes in Kentucky that has demonstrated a high level of pesticide resistance. Second, although the trap captures are very low now, these early captures may lead to damaging populations by mid to late season.

The beet armyworm is an occasional invader of

vegetable crops in Kentucky. Although it cannot overwinter here, it is a significant pest for vegetable growers because of its wide host range and resistance to most insecticides. This insect is killed by the first hard frosts in the fall. Producers of fall vegetable crops need to watch out for this pest during August and September.

The beet armyworm is a light-green to black larva with four pairs of abdominal prolegs and a dark head. There are many fine, white wavy lines along the back and a broader stripe along each side. There is usually a distinctive dark spot on each side just above the second pair of true legs.

For information on insecticides currently recommended for control of beet armyworm on vegetables, see ID-36, *Commercial Vegetable Crop Recommendations*. See ENTFACT 308, *Beet armyworm* for IPM information. Home gardeners should consider using Javelin, a *Bacillus thuringiensis* var *kurstaki* formulation, is effective against small beet armyworm larvae. Xentari, a *Bt* var *azaiwi* strain, is also effective, but is more difficult to find.

## LIVESTOCK

### **HORSE FLIES CAN PUT BITE ON HORSES, CATTLE AND PEOPLE** by Lee Townsend

Horse flies are large, robust flies that range from 3/4" to over 1-1/4" long. They are strong fliers that can move long distances from their breeding sites. Horse fly eggs are laid in batches of up to 1,000 on vegetation in marshy areas or along streams. The larvae are aquatic or semiaquatic and may take 2 to 3 years to reach the adult stage.

Horse flies inflict painful bites and can make animals miserable and difficult to work or handle. The flies only stay on animals long enough to feed. Females slash the skin with their broad, blade-like mouthparts, then lap up the blood that wells up from the wound. Work recorded in a USDA bulletin estimated that horse flies would consume 1 cc of blood for their meal, and that 20 to 30 flies feeding for 6 hours would take 20 teaspoons. This would amount to a quart in 10 days. While horse flies are rarely present in these numbers in Kentucky, only a few determined flies can cause animals to run wildly to escape attack.

A combination of factors, including movement, silhouette or color, CO<sub>2</sub> and/or odor attract horse flies to animals. While repellents or insecticidal sprays may provide some temporary relief or protection, the flies still locate the animals and attempt to feed. Fly pressure remains constant and the flies will resume feeding as soon as the material reaches a tolerable level on the animal. Reapply treatments as necessary and provide some shelter that the animal can enter if possible.

## **RAINFALL AND FLIES** **by Lee Townsend**

Dry manure- few flies, wet manure- many flies. Frequent rains have kept manure accumulations around animal facilities in ideal condition for fly breeding. Add some spilled feed and hay to this and you have the components for an explosion of house flies and stable flies over the next few weeks. Both rely on accumulations of moist organic matter as breeding sites for maggots. Warmer temperatures will accelerate the process and problems can become severe quickly.

Quick knockdown of a large portion of the fly population can be achieved with foggers or space sprays. Pyrethrins can be used safely around dairy and beef cattle if directions are followed. Residual sprays on fly resting sites can help and baits may provide some relief against house flies. See ENT-11 and ENT-12 for premise fly control around beef and dairy herds, respectively.

Movement of flies to surrounding houses can touch off some real conflicts. ENTFACT 506 provides some information on how far house flies can move.

## **SHADE TREES AND ORNAMENTALS**

### **POWDERY MILDEW IS APPEARING IN LANDSCAPE PLANTS** **by John Hartman**

Powdery mildew disease is beginning to appear in several woody plants in the landscape. It is highly visible, as usual, on lilacs, susceptible crabapples, and on vigorous shaded sprouts of oaks, as well as on flowering dogwoods. Based on how this disease has developed in recent years, the most serious problem now appears to be dogwood powdery mildew. Small patches of white mildew growth are now highly visible and infected leaves are

beginning to fade.

*Symptoms.* The mildew is made up of delicate, cobweb-like strands of fungus tissue covered with microscopic colorless asexual spores. Although mildew fungi grow mainly over the surface, they also penetrate the leaf surface with numerous fine filaments, which extract nutrients from the host plant. Heavily mildewed leaves may be distorted, turn yellow, dry up, and fall prematurely. Reduced flower quantity and quality the next season are also involved. Mildews appear most commonly toward the end of summer and in late fall and are most prevalent on succulent growth in shaded and damp locations. In the fall, minute, spherical, black bodies called cleistothecia - fruiting structures of the sexual stage of the fungus - may be visible to the unaided eye in the grayish white areas. The spores of the fungus may overwinter in these bodies. Some powdery mildews overwinter vegetatively in dormant buds of the infected tree.

*Cause.* There are a number of distinct species of powdery mildew fungi, which can be distinguished only by microscopic examination. Two species, *Microsphaera pulchra* and *Phyllactinia guttata* have been reported on dogwood. In Kentucky, we see both types with cleistothecia firmly embedded in the fungal mat on leaf surfaces; on leaves harvested without fruiting bodies, the cleistothecia develop in the laboratory.

*Control.* Resistant cultivars of flowering crabapples are available and offer an excellent means of control. Cornelian cherry and Kousa dogwoods are resistant, hybrids of Kousa and flowering dogwood and the flowering dogwood cultivar 'Cherokee Brave' are partially resistant, and all other flowering dogwoods are highly susceptible. Beneficial management practices such as pruning out infected twigs, raking up infected leaves, improving air movement around the trees, and increasing the amount of sunlight reaching them can often reduce severity of the disease. Dusting or wettable sulfur fungicides control powdery mildew. Other fungicides such as Banner Maxx, Bayleton, Benomyl, Cleary's 3336, Eagle, Immunox, Rubigan, and Strike are also effective for dogwood powdery mildew.

## **DIAGNOSTIC LAB HIGHLIGHTS** **by Julie Beale**

Both the Princeton and Lexington diagnostic labs are very busy--as usual for this time of year! Last week's diagnoses included Lepto leaf spot and Rhizoctonia crown rot on alfalfa; glume blotch and head scab on wheat. On tobacco, we diagnosed black shank, blackleg, blue mold, tomato spotted wilt virus, herbicide injury, nutritional problems and poor growth due to wet soils.

On ornamentals, we saw anthracnose (Colletotrichum) on daisy; Rhizoctonia stem rot on petunia; Heterosporium leaf spot and leaf rust on iris (see article from last week's KPN); Phytophthora aerial blight on vinca; red thread on turf; powdery mildew on euonymus; Phomopsis twig blight on juniper; and spot anthracnose as well as Discula anthracnose on dogwood.

On fruits, we diagnosed Mycosphaerella leaf spot on strawberry; and Pythium root rot on apple. On vegetables, we saw Fusarium stem and root rot on cantaloupe and cucumber; Rhizoctonia stem canker on bean; and late blight, early blight, southern stem blight, a Pseudomonas-type leaf spot, Fusarium crown and root rot, blossom end rot and cat-facing on tomato.

## **INSECT TRAP COUNTS**

**Princeton**

**June 5-12**

Black Cutworm . . . . .	2
Southwestern Corn Borer . . . . .	3
European Corn Borer . . . . .	0
True Armyworm . . . . .	36

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Lee Townsend, Extension Entomologist