KENTUCKY PEST NEWS
On line at: www.uky.edu/Agriculture/kpn/kpnhome.htm
Number 1050
April 4, 2005

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GENERAL - VEGETABLES, ORNAMENTALS, FORAGES, SOYBEANS

POTENTIAL GARDEN, FIELD AND WILDLAND RESERVOIRS OF SOYBEAN RUST IN KENTUCKY
by John Hartman, Kenneth Seebold, and Paul Vincelli

Soybean rust disease, caused by the fungus *Phakopsora pachyrhizi*, is newly introduced into the U.S. and is a potential threat to the Kentucky soybean industry. Commercial and garden beans are also susceptible and could suffer losses. Many other plants in the pea family (*Fabaceae*), both cultivated and wild, could serve as potential hosts of the soybean rust fungus. In consequence, infected plants could serve to provide primary inoculum to commercial soybean crops or in some cases could serve as an early warning for field development of soybean rust.

The following list of cultivated and native and naturalized hosts includes plants found in Kentucky that are known hosts of soybean rust elsewhere; also this list includes potential host plants belonging to the same genus, but not the same species of known hosts. The susceptibility of these hosts, especially under our conditions, is not known.
Cultivated hosts and potential hosts

- Bean (*Phaseolus vulgaris*) common garden bean, known soybean rust host (SRH).
- Blackeyed Pea (*Vigna unguiculata*) common garden blackeyed peas, known SRH.
- Clover (*Trifolium* spp.)
- Crimson clover (*T. incarnatum*) forage and pasture legume, known SRH.
- White clover (*T. repens*) common pasture legume and lawn weed, known SRH.
- Crown vetch (*Coronilla varia*) common statewide, used in road cut plantings with some escapes, known SRH.
- Hyacinth bean (*Lablab purpureus*) cultivated as an ornamental, known SRH.
- Japanese clover (*Kummerowia striata*) forage legume, known SRH.
- Korean clover (*Kummerowia stipulacea*) forage legume, escaped into open areas, known SRH.
- Lespedeza (*Lespedeza bicolor*) forage legume, known SRH.
- Lima, or butter bean (*Phaseolus lunatus*) common garden lima bean, known SRH.
- Lupine (*Lupinus alba, L. angustifolius, L. hirsutus*) common garden perennial flower, known SRH.
- Pea (*Pisum sativum*) common garden pea, known SRH.
- Soybean (*Glycine max*) soybean, the major host of soybean rust.
- Vetch (*Vicia* spp.).
  - Hairy vetch (*V. villosa*) escaped from cultivation to open areas and roadsides.
  - Spring vetch (*V. sativa*) European native, escaped from cultivation to open areas.
  - Yellow sweet clover (*Melilotus officinalis*) pasture and forage legume, escaped into open areas, known SRH.

Native and naturalized hosts and potential hosts

- Bush-clovers (*Lespedeza* spp., *Kummerowia* sp.)
- Bush clover (*L. intermedia*) upland woods and fields statewide except in the Bluegrass region.
- Creeping bush clover (*L. repens*) frequent, open woods, statewide.
- Korean clover (*K. stipulacea*) see cultivated hosts, above, known SRH.
- Round-headed bush clover (*L. capitata*) rare, Mississippian plateau.
- Silky lespedeza (*L. cuneata*) Asian native escaped from conservation projects.
- Virginia lespedeza (*L. virginica*) rare, open woods and fields.
- Virginia tick-trefoil (*Desmodium virginicum*) abundant, in fields, roadsides, statewide.
- Butterfly pea (*Centrosema virginianum*) may also grow here.
- Crown vetch (*Coronilla varia*) see cultivated hosts, above.
- Kudzu (*Pueraria montana*) common invasive to forest edge, statewide, known SRH.
- Lupine (*Lupinus perennis*) wild native lupine, also cultivated.
- Tick-trefoils (*Desmodium* spp.).
  - Hoary tick-trefoil (*D. canescens*).
  - Naked-flowered tick-trefoil (*D. nudiflorum*) common, in woods, statewide.
  - Panicled tick-trefoil (*D. paniculatum*).
  - Pointed-leaved tick-trefoil (*D. glutinosum*).
  - Round-leaved tick-trefoil (*D. rotundifolium*).
  - Sessile-leaved tick-trefoil (*D. sessilifolium*).
- Tick-trefoil, Sticktights (*D. perplexum*) abundant, in fields, roadsides, statewide.
- Vetch (*Vicia* spp.).
  - Wood vetch, Carolina vetch (*V. caroliniana*) common, moist woods, abundant in the east.
  - Hairy vetch (*V. villosa*) see cultivated hosts, above.
  - Spring vetch (*V. sativa*) see cultivated hosts, above.
  - Wild bean (*Phaseolus polystachios*) uncommon, moist woods, more common in the east.
  - Yellow sweet clover (*Melilotus officinalis*) see cultivated hosts, above, known SRH.

This list was derived from the November 26, 2004 list published by the USDA Office of Pest Management and
Policy with additional notes from the Indiana soybean rust host list compiled by Shaner and Thompson at http://www.ppdl.purdue.edu/ppdl/SBR/SBR_hosts.htm. For more information on identification of Kentucky native plants, consult *Wildflowers and Ferns of Kentucky* by Barnes and Francis and *The Wildflowers and Ferns of Kentucky* by Wharton and Barbour.

**TOBACCO**

**UPDATE ON BLUE MOLD**

by Kenny Seebold

This year marks the 26th anniversary of the Kentucky Blue Mold Warning System. Since blue mold season is right around the corner, now is a good time to review the System and get up to date on the status of the disease and control measures for 2005.

General. The Kentucky Blue Mold Warning System is coordinated by UK’s Department of Plant Pathology, and is a cooperative effort that involves Extension tobacco specialists from Kentucky and other parts of the U.S., county agricultural Extension agents, and the North American Plant Disease Forecast Center at North Carolina State University. Updates on the status of blue mold are available at www.uky.edu/Agriculture/kpn/kyblue/kyblue.htm and in the Kentucky Pest News. The National Blue Mold Forecast is available at www.ces.ncsu.edu/depts/pp/bluemold/.

Information used in the System comes from several sources. At the national level, we use the NC State Disease Forecast Center to confirm the presence of blue mold in locations known to be sources of inoculum outside the U.S., such as Cuba and Mexico. We also use this resource to keep abreast of blue mold outbreaks in the southern U.S. Specialists from other tobacco growing states are also relied upon for reports on the presence and movement of blue mold. At the local level, we ask that Extension agents in each county (County Blue Mold Coordinators) advise us when blue mold first appears in their county. Growers should report outbreaks of blue mold immediately to their local county Extension office. This is extremely important for two reasons: (1) this information is needed to update the KY Blue Mold Warning System and is the basis for advisories issued by the System, and (2) first cases of blue mold must be confirmed to ensure that we are truly dealing with blue mold.

It is important to note that samples from initial outbreaks IN EACH COUNTY should be submitted to the Plant Disease Diagnostic Laboratory in either Lexington or Princeton to confirm the presence of blue mold in that county. The tobacco trade agreement with China stipulates that blue mold be properly documented in each county of Kentucky and that samples be sent to USDA-APHIS to be examined for oospores (the overwintering survival structure produced by the blue mold pathogen). Failure to adhere to these guidelines could have a negative impact on tobacco exports to China from the Commonwealth.

Using the System. The KY Blue Mold Warning System web page will be updated as new information is available; weekly updates will also be published in the Kentucky Pest News. We will continue to use Dr. Bill Nesmith’s “status levels”, which are based upon the threat level present at the time of issuance of an alert. There are three status levels in the System:

1. **Advisory** – issued when the conditions for blue mold are largely unfavorable and the need for action is not urgent. Advisories have been issued historically to keep agents and growers abreast of the status of blue mold outside the Commonwealth, and to provide general information about the disease to maintain grower awareness.
2. **Watch** – issued when environmental conditions favor the development and spread of blue mold, normally before blue mold has been confirmed in the Commonwealth. When a blue mold watch is issued, we believe that viable spores of the blue mold pathogen will or have arrived in a region where crop and weather
conditions favor infection and spread of the disease. Growers should initiate preventative control measures and keep a close watch on their crops for symptoms of blue mold. Prevention is the most effective way to minimize losses to a disease with the explosive potential of blue mold. Once blue mold gains a foothold, it takes significantly more effort on the grower’s part to slow it down (if at all). Managing an epidemic of blue mold is like stopping a boulder from rolling downhill. It is much easier to keep the boulder from crashing into the valley below if attempts are made to stop it at the top of the hill when the boulder has just started moving rather than when it has picked up speed and momentum!

3. Warning – issued when blue mold has been confirmed in an area. A warning will remain in effect for as long as conditions favor infection and spread of blue mold. Growers should continue with recommended control practices during a blue mold warning. I’ll repeat here that control measures should be in place before a warning is issued, and that waiting for blue mold to appear before applying fungicides can lead to heavy losses! Growers should advise local county agents of disease levels and effectiveness of control measures where blue mold is active.

Blue Mold Status as of 1 April 2005. Active blue mold has been confirmed in western Cuba, and in western and southern Mexico. Conditions are favorable for movement and deposition of spores in the panhandle of Florida. The chance of spore survival is low, thus the threat to U.S. production areas at this time is low. No active blue mold has been reported in the U.S. to date. A blue mold advisory will be issued when the disease is reported in the U.S.

Recommended Controls. The following is a summary of labeled fungicide options for control of blue mold.

TRANSPLANTS: Our only labeled option for management of blue mold on tobacco transplants is Dithane DF. Dithane DF can be applied to larger transplants (seedling leaves larger than a dime) on a 5-7 day schedule at 0.5 lbs/100 gallons of water. Continue applications until transplanting. Apply Dithane DF using high pressure and small droplet size. Note that Dithane will also suppress damping-off caused by *Rhizoctonia solani* and *Fusarium* spp., and anthracnose.

FIELD: Dithane DF and Acrobat 50WP are our only labeled materials for management of blue mold in Kentucky. Please see product labels for use indications. Acrobat must be tank-mixed with Dithane, according to the label.

Quadris Update. According to my sources, expansion of the Section 3 label to include tobacco is still pending a decision by the Environmental Protection Agency (EPA). Kentucky does not have a Section 18 exemption from the label for 2005, so this material should not be used on tobacco until the Section 3 label expansion is granted by EPA. We do not know at this time if Quadris will be available to tobacco growers in Kentucky in 2005.

CORN

ATRAZINE – SUPPLEMENTAL LABELING FOR WATER QUALITY PROTECTION
by J. D. Green

A supplemental label was issued by the EPA this past winter for all herbicide products which contain atrazine as an active ingredient. Under the guidelines of this special label use of atrazine products must comply with the requirements of the Memorandum of Agreement (MOA) between the U.S. Environmental Protection Agency and the registrants of pesticide products that contain the active ingredient atrazine. Any herbicide product which contains atrazine must have attached the supplemental label and users should follow these guidelines even if the product had been purchased in previous years.

The supplemental label emphasizes that atrazine containing products are Restricted Use Pesticides due to ground and surface water concerns. Furthermore, within the Environmental Hazards section of the label it emphasizes the use of filter strips and application setbacks in areas of the field where points of runoff can enter surface
and/or ground water sources. Maximum use rates limitations must also be followed. Under the Directions for Use it states “ANY USE OF THIS PRODUCT IN AN AREA WHERE USE IS PROHIBITED IS A VIOLATION OF FEDERAL LAW.” For specific rate limitations and setback requirements consult the product label. General guidelines for maximum rates and application setbacks can also be found on page 23 in University of Kentucky Extension Bulletin (AGR-6) "Weed Control Recommendations for Kentucky Farm Crops-2005" or the Atrazine Best Management Practices bulletin provided by the Kentucky Department of Agriculture.

The purpose of the supplemental labeling requirements is to help vulnerable watersheds comply with the Safe Drinking Water Act. This federal law requires public water utilities to monitor for atrazine and other substances in public drinking water systems. A community water system is out of compliance if the running annual average for atrazine is above the Maximum Contaminant Level (MCL). When detected above the MCL, water utilities are required to notify the public and take action to reduce levels below the MCL. Initially, two community water systems in Kentucky where considered highly vulnerable due to high detection levels of atrazine within these watersheds. However, drinking water systems in three additional watersheds are now also being closely monitored in Kentucky due to high levels of atrazine detections. The significance of the Memorandum of Agreement that was signed by the EPA and the herbicide manufacturers is that if high detection levels of atrazine in drinking water systems cannot be diminished within a reasonable time period, all uses of atrazine will be permanently banned from that watershed without further EPA review. The loss of atrazine within some crop production areas of Kentucky could have a significant economic impact on weed management options for corn producers.

WHEAT

ARMYWORM FLIGHT HAS BEGUN
by Doug Johnson

The first of the season’s insect pests of field crops has made its appearance. Moths of the armyworm, also called the true armyworm, *Pseudaletia unipuncta,* have been captured in pheromone baited traps on the UK Experiment Station in Princeton, Caldwell Co., KY. Also, Dr. Ron Hines of the University of Illinois Experiment Station in Dixon Springs, IL reports that armyworm has been captured in pheromone traps in Pope Co. IL. This is a common insect pest of grass crops, generally small grains and corn in our area.

This is a really early notice and simply indicates that the season has begun. No action is needed at the moment, except to remain alert as we progress through the spring. It appears this flight timing is occurring at about the same date as last year and the numbers are not out of the normal range. Peak moth capture generally occurs in mid to late April, and this is when you need to be watching for the damaging (worm) stage. You can follow the moth flight numbers each week in Kentucky Pest News at: [http://www.uky.edu/Agriculture/kpn/kpnhome.htm](http://www.uky.edu/Agriculture/kpn/kpnhome.htm). Our traps are checked every Friday and the results will appear in the following week’s edition.

You can compare these numbers to past years by looking at the pheromone trap database in the KY-IPM web pages at: [http://www.uky.edu/Agriculture/IPM/ipm.htm](http://www.uky.edu/Agriculture/IPM/ipm.htm). Look for “Pheromone Trap Data” on the navigation menu on the left side of the IPM home page. This will take you to the pages where the historical data is stored.

The database pages contain historical information for several insects. For armyworm, you will likely be most interested in the counts from 2001. This was the most recent outbreak year. Note that each file contains several pages. One will have the raw data and others will have graphs by date and by accumulated day-degrees. Additionally, there is a separate section specifically for the 2004 data of all insects that we monitor. In this section you can also see data taken by Mr. Cam Kenimer, County Agent for Ag & Nat. Res. in Fulton Co. KY, and a link to Dr. Ron Hines’s pages in southern Illinois.
So, it is time to start watching for armyworm and other insects that might occur in your wheat fields.

FRUIT CROPS

PHEROMONE TRAPPING FOR FRUIT PESTS BEGINS AT BLOOM
by Ric Bessin

The start of bloom is time to begin monitoring for fruit pests with pheromone traps in your orchard. We are recommending the use of pheromone traps for monitoring of codling moth, Oriental fruit moth, grape berry moth, peachtree borer, and lesser peachtree borer. These pheromone traps use specific lures that attract the male of the pest species. Unlike Japanese beetle traps, these traps do not attract female moths and they do not increase damage in the orchard.

We use the pheromone traps to determine when the moths become active. Capturing many moths in a trap usually means that the egg laying will likely occur soon and hatch of the larvae is not far off. We use the traps identify when the peak flight has occurred, then time our treatments accordingly. For example, with codling moth, after the fifth moth is captured in the spring, we wait from 100 to 250 DD (base 50) before applying an insecticide. Some insecticides that use insect growth regulators are best applied earlier (100 to 150 DD) while others perform better close to egg hatch (250 DD). With Oriental fruit moth, degree days are accumulated after the first sustained moth flight and an insecticide applied after 75 to 175 DD (base 45). As with the sprays for codling moth, those that use insect growth regulators are best applied earlier.

We also use pheromone traps to estimate the relative number in a particular generation. For example, if we are capturing less than 5 codling moths per trap per week, then we do not need to be using an insecticide for codling moth larvae.

VEGETABLES

ASIAN SOYBEAN RUST – A THREAT TO EDIBLE LEGUMES IN KENTUCKY?
by Kenny Seebold and John Hartman

With the arrival of Asian soybean rust (ASR), caused by the fungus *Phakopsora pachyrhizi*, in nine states in the U.S. in 2004, growers and scientists in the soybean-producing regions of our country are anxiously waiting to see how severe the disease will be in the 2005 crop. There’s good reason to be on guard; soybean rust has proven to be a devastating disease in Asia, Africa, and South America, where it has now become well established. What’s more, *P. pachyrhizi* can attack a number of other leguminous species, including certain weeds and cultivated crops common in Kentucky. The list of cultivated legumes includes dry and succulent (garden or snap) beans (*Phaseolus vulgaris*), lima and butter beans (*P. lunatus*), blackeyed peas (*Vigna unguiculata*), and green (or English) peas (*Pisum sativum*).

Little information is available as to how ASR will affect edible legumes. Although soybean is highly susceptible to ASR, the susceptibility of beans and peas to the disease is relatively unknown. Reports from Brazil indicate that edible legumes may not be as susceptible to ASR as soybean, but remember that research on this disease has not been conducted in the U.S. Given the unknowns, it is impossible to predict potential losses in edible legumes to ASR at this time. No one knows for certain when or if ASR will strike Kentucky in 2005, but reports from Florida indicate that the pathogen has overwintered successfully and is present in two counties near Tampa. It is reasonable to expect that ASR will begin a steady trek northward. In the event that ASR does reach Kentucky, early detection will be critical in preventing losses. County agents and growers should consider the following:

**Pathogen identification.** Learn to recognize the signs and symptoms of ASR. On soybean, symptoms include small, tan-to-reddish brown lesions on leaves. Pustules, associated with each lesion, form on the undersides of
leaves and sporulation may be evident. It is possible to confuse ASR with other diseases, including common rust of bean caused by *Uromyces appendiculatus*. Diagnostic guides for ASR are available on the UK Extension Plant Pathology web page. Suspicious symptoms should be reported quickly and samples sent immediately to the Plant Disease Diagnostic Laboratory in Lexington or Princeton so that a definitive diagnosis can be made.

**Pathogen biology.** Understanding the biology of *P. pachyrhizi* is crucial in the war against ASR. The fungus will not survive between seasons in Kentucky, because our cold winter temperatures will kill off hosts of *P. pachyrhizi*, and this fungus needs a live host to survive. It’s unlikely, then, that we will see ASR early in the growing season. It is also important to consider the effect that weather will have on ASR. Typically, the disease is favored by warm temperatures and long (> 6 hours) periods of leaf wetness (dew or rain). Disease has been severe on soybean grown in the humid tropics because ideal conditions exist nearly year-round for development and spread of ASR. In Kentucky, where a temperate climate prevails, ideal conditions will be limited to specific times of the year. What does this mean? It means that even if ASR appears in Kentucky, the risk of severe losses should not be as high as in the more southerly states of the U.S (keeping in mind that under ideal conditions we could see severe damage).

**Pathogen movement.** Knowing where the ‘enemy’ is in relation to Kentucky production areas, and knowing the enemy’s movements are critical first steps in formulating a management strategy for ASR. Resources such as the USDA’s Public Soybean Rust site ([www.sbrusa.net](http://www.sbrusa.net)) are available and can be used to track movement of ASR in the U.S. The University of Kentucky’s Department of Plant Pathology maintains a web page that features tools for tracking ASR as well ([www.uky.edu/soybeanrust](http://www.uky.edu/soybeanrust)). As always, growers should scout fields regularly to monitor disease and pest levels; however, if ASR is reported near or in Kentucky, these efforts should be redoubled. Be vigilant - Asian soybean rust is an explosive disease and could cause big-time losses in a short period if conditions are favorable.

**Control options.** Scouting commercial plantings of edible legumes regularly for ASR, other diseases for that matter, is extremely important. If and when ASR is confirmed in Kentucky, quick action will be necessary to reduce the risk of severe losses to the disease. The question is what can be done to manage ASR in edible legumes once the disease arrives in the Commonwealth? The consensus of plant pathologists in the southeastern U.S. is that fungicide programs already in place for control of bean and pea diseases will likely provide some degree of suppression of ASR. At this time, there are no fungicides labeled specifically for control of ASR on edible legumes. Materials that are believed to be effective against ASR (based upon data from soybean trials outside the U.S.) and are labeled on succulent beans include sulfur, chlorothalonil (Bravo, Equus, etc.), azoxystrobin (Quadris 2.08SC), and myclobutanil (Nova 40WP). Florida and Tennessee have recently submitted requests for Section 18 exemptions for Nova, propiconazole (Tilt), and tebuconazole (Folicur) for succulent beans. These exemptions would cover all states east of the Mississippi river; however, the status of the exemptions is not known at this time and they may not be in place for the 2005 season.

The only fungicide options for English pea are sulfur and Quadris. With the exception of Nova, the fungicides that have been mentioned are protectants and must be applied before disease starts for maximum efficacy. Also, materials such as Quadris and Nova must be rotated with other active ingredients; back-to-back applications are prohibited. Please see product labels for rates, application intervals, and maximum amounts of product allowed per season.

Home gardeners will have fewer fungicide options than commercial growers and should remember that no products exist in the home and garden market that are labeled specifically for control of ASR. Certain vegetable fungicides that contain active ingredients such as sulfur, chlorothalonil, mancozeb, or maneb are expected to have some level of activity against ANR. Because most home gardeners do not spray fungicides on a regular basis, they should check plants often and spray products at the labeled rate at the first sign of disease. Product labels should be read carefully for rates and application instructions prior to use. Taking steps to minimize periods of leaf wetness, such as choice of planting site (open, non-shaded areas) and watering when conditions favor quick
drying (morning or afternoon vs. late afternoon or evening) should be practiced by commercial growers and homeowners alike.

**SLUGS ATTACKING SOME EARLY VEGETABLES**
by Ric Bessin

There have been a few calls this week about slug damage to early vegetables. The early spring is a prime time for slug damage as this is a wet time of the year, slugs cannot tolerate dry conditions. It’s also cool during the early spring which means that there is slow plant growth which will make a small amount of damage look worse.

Slugs damage plants at night or on cloudy days. They have rasping mouthparts and often leave a plant severely scarred. They often leave narrow long channels of damage on the leaf surface. Temperatures in the 60's favor slug damage.

Slug control in vegetables can be difficult. There are a few products labeled for use in vegetables (metaldehyde and iron phosphate) but care must be taken to avoid contact with the edible parts of vegetables when applying materials containing metaldehyde. Poorer control should be expected during wet rainy periods, as this not only favors additional slug activity, but also reduces the effectiveness of some slug control materials. Timely weed control in the rows can also aid in reducing harborages for slugs during the day.

**LANDSCAPE PESTS**

**DEALING WITH SLUGS**
by Lee Townsend

Cool temperatures and spring rains are great for slugs. These creatures glide along on shiny mucous trails, rasping away at most any organic matter that they find. Immature slugs tend to feed on surface tissue while larger individuals abrade irregular holes in foliage. They may eat several times their body weight each night so there can be a lot of damage in a short time. Their slime trail is a distinctive calling card.

Slugs generally hide during the day but are apparently motivated more by rising temperature than an aversion to light. They prefer temperatures in the low 60's and try to avoid temperatures above 70F. They can detect changes as gradual as 2 F per hour! Warmer temperatures spur them to crawl to a cool, humid shelter. Consequently, sanitation - removal of hiding places, is an important part of slug management. Dense ground covers, plant debris, and mulch provide food and shelter. Improved ventilation also may force slugs to leave an area. Pruning or thinning plants to allow greater air movement and penetration of sunlight (warming) can help to reduce slug problems.

Trapping can become a part of a slug control program, especially when coupled with a thorough clean-up that reduces hiding places. This approach turns slug hideouts against them. Pieces of moist cardboard, rolled-up newspaper, boards, or upturned flower pots can be left on the ground in a few spots. Slugs will tend to accumulate under the shelter and can be scooped up and discarded. It is good to have these items propped about 1" above the ground so that the slugs can get under them easily. Keep the shelters in place during "slug season". This approach is most successful when there are not many other hiding spots and weather conditions cause the slugs to seek shelter.

Beer traps will collect many slugs because they are attracted to fermentation odors and drown in the liquid. Adjusting the trap so the rim is about one-half inch above the soil line will reduce the number of ground beetles and other non-target creatures from being caught. Fill the container about half-full and replace the contents every few days. Sugar water with some yeast can be used in place of beer.
In general, insecticides have little effect on slugs and chemical control is limited to applications of baits containing metaldehyde or metaldehyde + carbaryl (Sevin) as the active ingredient(s). The bait needs to be scattered evenly over the ground so that slugs encounter the pellets as they slide along in search of food. Baits disintegrate following rain or heavy dew so additional applications may be necessary. Also, metaldehyde is broken down by sunlight so it is relatively short-lived. Spreading the bait late in the day, rather than early in the morning, will help to get in front of the slugs with minimal loss.

Barriers can provide some relief if the slugs are moving in from outside the area that is being protected. Wood ash or fine lime can be used but both lose their effectiveness when wet and too much wood ash is not good for the soil. Slugs do not like to cross copper. A copper barrier tape (about 1” wide) can be used along borders or around the legs of greenhouse tables to deter slugs. There are wider copper barriers that can be set in the soil as fences but the expense makes this most suitable for small areas.

**SPRINGY SPRING CREATURES - TEMPORARY NUISANCES**
by Lee Townsend

Springtails are tiny wingless insects that can flip into the air, giving them the appearance of tiny fleas. They would go completely unnoticed except that hundreds of them can accumulate on surfaces like a small, dusty gray carpet that moves.

Most springtails live in rich soil or leaf litter, under bark or decaying wood, or associated with fungi. Many are scavengers, feeding on decaying plants, fungi, molds, or algae. Springtails become abundant among wet leaves, soil, and plant material along a house foundations or sidewalks where they can be a temporary annoyance. They also can occur around floor drains, in damp basements, and crawl spaces. Masses of these insects can be swept up and discarded.

Most common springtails do not survive in dry conditions. Any steps to improve ventilation and promote drying are the best long term solutions. Removal of accumulations of wet leaves or other organic matter will eliminate breeding sites. Aerosol household insecticides can be used to treat infestations but will provide only temporary relief if the favorable conditions are not corrected.

**HOUSEHOLD**

**IT’S TERMITE SEASON**
by Mike Potter

Termite season has begun in Kentucky. During the next several weeks, you'll probably spend more time responding to termite calls than to any other insect pest. To complicate matters, the public has little understanding of termites, and what should be done if their home is infested. This column will help you answer their questions.

Q: Why be concerned about termites?
A: Termites cause billions of dollars in damage each year. They primarily feed on wood, but also damage paper, books, foam board insulation, and even swimming pool liners and filtration systems. Termites can injure living trees and shrubs, but more often are a secondary invader of woody plants already in decline. While buildings may become infested at any time, termites are of particular importance when buying or selling a home since a termite inspection is normally a condition of sale. Besides the monetary impact, thousands of winged termites emerging inside one’s home are an emotionally trying experience — not to mention the thought of termites silently feasting on one’s largest investment.

Q: Why are infestations often discovered during March - May?
A: Spring typically is when large numbers of winged termites, known as “swarmers,” emerge inside homes. In nature, termites swarm to disperse and start new colonies. Triggered by warmer temperatures and rainfall, the winged termites emerge from the colony and fly into the air. The swarmers then drop to the ground, shed their wings, pair off with a mate, and attempt to begin new colonies in the soil. Few swarmers emerging outdoors survive to start new colonies. Swarmers emerging indoors are incapable of eating wood, seldom survive, and are best removed with a vacuum cleaner. They do, however, indicate that an infestation is present.

Q: How will I know if my home is infested?
A: Discovering winged termites indoors almost always indicates an infestation warranting treatment. People often confuse winged termites with ants, which often swarm at the same time of year. Termites can be differentiated by their straight antennae, uniform waist and wings of equal size. (Ants have elbowed antennae, constricted waists, and forewings that are longer than the hind wings.) The swarmers are attracted to light and are often seen around windows and doors. Termite swarmers emerging from tree stumps, woodpiles, and other locations out in the yard are not necessarily cause for concern, and do not always mean that the house is infested.

On the other hand, if winged termites are seen emerging from the base of a foundation wall or adjoining porches and patios, there’s a good chance the house is infested also and treatment may be warranted.

Other signs of infestation are earthen (mud) tubes extending over foundation walls, support piers, sill plates, etc. The mud tubes are typically about the diameter of a pencil, but sometimes can be thicker. Termites construct these tubes for shelter as they travel between their underground colonies and the structure. To help determine if an infestation is active, the tubes may be broken open and checked for the presence of small, creamy-white worker termites. If a tube happens to be vacant, it does not necessarily mean that the infestation is inactive; termites often abandon sections of tube while foraging elsewhere in the structure. Termite-damaged wood is usually hollowed out along the grain, with bits of dried mud or soil lining the feeding galleries. Wood damaged by moisture or other types of insects (e.g., carpenter ants) will not have this appearance. Occasionally termites bore tiny holes through plaster or drywall, accompanied by bits of soil around the margin. Rippled or sunken traces behind wall covering can also be indicative of termites tunneling underneath.

Oftentimes there will be no visible indication that the home is infested. Termites are cryptic creatures and infestations can go undetected for years, hidden behind walls, floor coverings, insulation, and other obstructions. Termite feeding and damage can even progress undetected in wood that is exposed because the outer surface is usually left intact. Confirmation of infestation often requires the keen eye of an experienced termite inspector. However, even the most experienced inspector can overlook infestation or damage which is hidden.

Q: Can I treat the house myself?
A: Ridding a home of termites requires special skills. Knowledge of building construction is needed to identify the critical areas where termites are likely to enter. Many of these potential points of entry are hidden and difficult to access. Termite control also utilizes specialized equipment such as masonry drills, pumps, large-capacity tanks, and soil treatment rods. A typical treatment may involve hundreds of gallons of a liquid pesticide, known as a termicide, injected into the ground alongside the foundation, beneath concrete slabs, and within foundation walls. In short, termite treatment is a job for professionals. A possible exception would be if a mailbox post, sandbox or other small wooden object not attached to the house was infested. “Do-it-yourself” termite baits (see bait comments below) sold at retail stores or bought over the internet will seldom eradicate an existing termite problem.

Q: How do I choose a pest control company? Why is there such variance in price?
A: These are complex questions. The company should be licensed by the Kentucky Department of Agriculture. Membership in the Kentucky Pest Control Association and/or National Pest Management Association suggest the company is an established firm with access to technical and training information.
needed to do the job correctly. As with any service company, references are invaluable. Consider calling at least 2-3 companies. Requesting inspections and estimates from more than one company will help verify the existence of a termite problem and allow you to compare services. Companies offer different types of treatment methods and warranties. If termites happen to return, most will retreat the affected areas at no additional charge. A smaller percentage of firms also will repair damage occurring subsequent to their treatment, although dating onset of termite damage is a hard thing to determine. In some cases, no warranty will be offered if wells, cisterns, sub-slab heating ducts, drainage systems, or inaccessible crawl spaces make it impossible to treat in accordance with industry standards.

Take your time when selecting a company. Termites damage wood slowly; the amount of damage caused by taking an additional day, week, or month to make an informed decision is insignificant. Avoid firms that try to pressure you into signing a contract immediately with “specials” or scare tactics. The overall quality of a termite job depends less on the sales person than on the technician who does the work. A safe and effective treatment requires an experienced technician, not someone who was hired a few weeks ago.

Q: Which treatment methods and products are most effective?
A: Another challenging question. There are two general categories of termite treatment, liquids and baits. Soil-applied liquid termiticides have been around for decades. Their purpose is to provide a long-lasting chemical barrier that excludes termites from the ground from entering buildings. In most cases, termites in the structure die off as well since they cannot return to the soil. Most former products were repellent rather than lethal to termites foraging in the soil. Newer materials such as Termidor® (fipronil), Premise® (imidacloprid) and Phantom® (chlorfenapyr) are non-repellent, and termites tunneling into the treatment zone are killed. Overall, the non-repellent products are proving to be much more reliable in their ability to resolve problems in the first attempt. All registered termiticides (both repellent and non-repellent) can be effective, however, and homeowners should not base their purchasing decision on product alone.

The other broad treatment category is baiting. Termite baits consist of paper, cardboard, or other “termite-friendly” food, combined with a slow-acting substance lethal to termites. The baits are installed below ground out in the yard in cylindrical plastic stations. Others are sometimes placed indoors over active termite mud tubes. Foraging termites consume the bait and share it with their nest mates, resulting in a gradual decline in termite numbers. On some properties, baits may constitute the only form of treatment; on others, they may be combined with liquid applications to areas where termites are observed. Several baiting systems are available, including Sentricon®, Exterra™, FirstLine®, Advance™, and Subterfuge®.

Termite baiting is a very complex subject. A detailed discussion of the considerations in having your home treated with baits versus liquids is provided in entomology extension publications, Entfact-639: Termite Baits: A Guide for Homeowners. (All four of our termite-related Entfacts were recently updated and posted on the entomology department website). No matter which method or product is selected, it’s important to have an experienced technician, backed by a responsible pest control firm.

Q: Does the entire house need to be treated... or can they "spot treat" areas where I see termites?
A: Subterranean termite colonies may contain hundreds of thousands of individuals foraging in many different directions. For the homeowner, localized or “spot” treatments are generally a gamble except in cases of retreatment. Most reputable pest control firms will not warranty spot treatments, since it’s likely that termites will eventually find other points of entry into the structure.

Some companies may offer to do a so-called “perimeter” treatment using one of the non-repellent liquid termiticides (e.g., Termidor or Premise). Typically this will involve a thorough application around the entire outside foundation wall of the building, and spot-treating any infested or high-risk interior areas. If the homeowner is considering such a treatment, they should inquire whether it will be accompanied by a service
agreement in case termites return. (Service renewal agreements usually state that if termites return, the company will return and retreat the affected areas at no additional charge provided the renewal agreement is maintained.) Purchasing any treatment approach is a bit of a gamble, unless the offer is accompanied by an ongoing service agreement.
Q: How long will the treatment last?
A: All liquid termiticides are supposed to control termites for at least five years when applied according to label directions. The actual length of control on a given structure will depend on such factors as thoroughness of the application, environmental conditions, and density of termites in the area. When termites persist a year after treatment it's usually because they have found an untreated gap in the chemical barrier.

Q: Will the chemicals harm my family or pets?
A: Termiticides are tested extensively for adverse effects on health. Before a product can be used, numerous studies are conducted by the manufacturer and independently evaluated by the U.S. Environmental Protection Agency. Based on the current body of knowledge, registered termiticides pose no significant hazard to humans, pets or the environment when applied according to label directions. Despite the negligible health risk from a properly performed termite treatment, people with lingering concerns should consult their physician. Most of the newer liquid products have essentially no odor. Clients who are still apprehensive may want to consider having their home treated with baits.

Q: Have I been “cheated” if termites continue to infest my house after treatment?
A: Not necessarily. Unlike other services such as plumbing or electrical work, termite control involves living creatures. The best treatments performed by knowledgeable firms may fail at times, when termites find their way through tiny, untreated gaps in the soil. While the intent is to establish a continuous, impenetrable chemical barrier, this is all but impossible to achieve in actual practice. In the case of baits, it may take several months for termites to initially find the bait stations in the soil, and several months more to achieve control. The key is to hire a reputable pest control firm employing experienced, conscientious technicians. Companies will return and retreat affected area(s) at no additional charge provided the service agreement is purchased and maintained.

As mentioned earlier, four different termite-related “Entfacts” were recently updated and are posted on the entomology department website.

CLUSTER FLIES MOVING OUTSIDE
by Lee Townsend

Two samples of face flies came in early this week from the southern tier of counties in the state. The first situation described “enormous swarms on house and back porch chimney”. The second noted “flies clustered on walls and windows by the hundreds.” Both mentioned beef cattle pastured nearby.

Flies in the samples were face flies, part of the cluster fly or attic fly group that includes blue bottle flies and one actually called the cluster fly. All three species spend the winter as adults in sheltered places. Longer days and warmer temperatures prompt all three species to move back outside.

Last year’s wet summer probably contributed to higher than normal numbers of these flies entering shelter for the winter. Extra moisture can contribute to slower drying of cattle manure, the only breeding site for this species. The flies will move to cattle and stay there for the summer. Their offspring will return to shelter next fall. No need for control measures now.

PESTS OF HUMANS

TICKS ACTIVE AND HUNGRY
by Lee Townsend

Immature stages of the lone star tick are active and it is easy to pick them up while working in or walking through overgrown areas. Having successfully passed the winter under surface litter, these small ticks now are searching for their first blood meal of the season. Ticks are most abundant in overgrown areas along trails or the
edges of woods where small mammals live or where deer are active. The ticks wait on grass blades to be picked up by passing animals. After engorging themselves, they small ticks will drop to the ground, digest their meal, and molt to the next stage.

Here are some tips to protect you while outdoors:
• Wear light-colored long sleeved shirts and long pants. The light color will make ticks easier to spot. Tucked pant legs will keep ticks from reaching the skin easily.
• Check yourself frequently for ticks so you can remove them before they become attached. Ticks tend to move upward on the body and attach under the arms or along the nape of the neck.

Repellents can provide protection from tick attachment. Read the product label for specific instructions - general precautions for any repellent include:
• Apply only to exposed skin or clothing.
• Never use repellents over cuts, wounds, or irritated skin.
• Do not apply to close to eyes or mouth.
• Wash repellents off after returning indoors

DEET Repellents
Use just enough to cover exposed skin or clothing (do not apply to skin covered by clothing)
Do not be spray repellents directly onto the face. Spray on hands first, then rub on face Do not apply to hands of small children Do not be use on irritated skin or skin damaged by cuts or rashes Do not apply repellents in enclosed areas indoors Apply every 4-8 hours, more frequent use is not necessary

Permethrin-based repellents (Permanone)
Do not apply to skin! Apply only to outside of clothing before wearing - and do not saturate clothing Do not treat clothing more than once every 2 weeks Hang all treated clothing outdoors to dry for at least 4 hours before wearing Wash treated clothing at least once before treating again.

DIAGNOSTIC LAB-HIGHLIGHTS
by Julie Beale and Paul Bachi

Recent samples in the Diagnostic Laboratory have included black knot on plum; fertilizer burn on geranium and tomato transplants from greenhouses; iron toxicity (low pH-related) on geranium; Macrophoma leaf spot on holly; Phytophthora root rot on eastern hemlock; white pine decline (abiotic); and sooty mold due to scale infestations on various species of woody ornamentals.

INSECT TRAP COUNTS
UKREC, Princeton KY

March 25 - April 1
Black Cutworm - 1
True Armyworm - 11

For information on trap counts in southern Illinois visit the Hines Report at –
http://www.ipm.uiuc.edu/pubs/hines_report/comments.html
The Hines Report is posted weekly by Ron Hines, Senior Research Specialist, at the University of Illinois Dixon Springs Agricultural Center.