TOBACCO

DISEASES OF TOBACCO TRANSPLANTS II
by Kenny Seebold

In last week’s article, we reviewed the epidemiology and management of Sclerotinia collar rot in the float system. This week, we’ll take a look at another serious problem in Kentucky float beds: Pythium root rot (PRR).

Pythium root rot

The float tray system for producing tobacco transplants offers many advantages over older methods; however, the float system creates ideal conditions for Pythium root rot. Several species of Pythium, a fungus-like organism
that is grouped in the Oomycota (or water molds), can cause root rots on tobacco seedlings. The first symptoms of PRR are often yellowing and stunting of transplants in a defined area of the transplant facility. As the disease progresses, seedlings will wilt and root systems will decay. Lower stems and roots of plants with PRR will often have a darkened, necrotic appearance, and roots may be slimy. Infected roots will eventually slough off; some regrowth may be observed, but new roots will eventually be infected. Damping-off and seedling death are possible; however, stunting and yellowing due to root infection are the most common symptoms reported in Kentucky. Seedlings with PRR that are later transplanted in the field are more susceptible to diseases such as black shank and Fusarium wilt.

Water temperatures greater than 72 °F favor development of PRR in float systems. *Pythium* species (spp.) are adapted to wet conditions and need water, abundant in the float system, for reproduction and movement. Initial infections likely result from germination of oospores, the principle resting and survival structure *Pythium* spp., and production of zoosporangia. Swimming spores, or zoospores, are released from zoosporangia and will move toward plant roots. Zoospores are attracted to chemicals exuded from the roots of tobacco, acting like miniature guided missiles. After encountering host tissue, zoospores encyst and enter the root system to establish an infection. Multiple cycles of zoospore production and infection will occur afterward.

Infested soil or Styrofoam trays are the most common means of introduction of *Pythium* spp. into float systems. Survival structures of *Pythium* spp. are common in our soils and can be carried on shoes or implements. Tobacco roots will penetrate Styrofoam float trays. *Pythium* spp. can survive on these roots, providing a source of inoculum when the trays are re-used.

Careful application of sanitation and cultural practices is paramount to the successful management of PRR in the float system. The float system fulfills one of the major ecological requirements of *Pythium* spp. – water! This means that we start the transplant production cycle “behind the eight ball”. It is important, then, to minimize the amount of inoculum introduced into the system. This can be accomplished through sanitation of used transplant trays. Trays can be steamed at 165-170 °F for 30 minutes (after the heating chamber reaches operating temperature). Methyl bromide, though effective, is expensive, dangerous, and may be difficult to obtain. Dipping used trays in bleach or other disinfectants is largely ineffective because the chemicals cannot penetrate and reach pathogen-infested roots that have grown into the tray. NEVER use pond or surface water to fill float beds as water from these sources is likely contaminated with *Pythium* and other plant pathogens. Do not re-use growth media. Discard diseased plants in areas away from transplant houses. Make sure that shoes and tools are cleaned before bringing them into a transplant facility.

Terramaster 35WP or Terramaster 4EC, formulations of etridiazole, are labeled for use in float systems and are effective against PRR. Check the product label for rates and use directions. Preventive applications of Terramaster are advised and preferred. “Rescue” applications of Terramaster in systems with active PRR will halt further development of disease and symptomatic seedlings will likely recover. However, the higher rates of Terramaster used in rescue treatments increase the risk of phytotoxicity AND recuperating plants may still harbor *Pythium* that can weaken them and neighboring plants later in the season (and increase their susceptibility to black shank and Fusarium wilt). Getting a head start against PRR will pay off in the long run!

**Blue Mold Status**

No active blue mold has been reported in the U.S. as of 15 April 2005. A blue mold advisory will be issued when the disease is reported in the U.S.

**CORN/SOYBEANS**

**DANDELION IN GRAIN CROPS**

by James R. Martin

Dandelion has rarely been a major issue in crops grain crops, yet there is mounting evidence that it may be increasing as a problem in no-till corn and soybeans. Some of our northern neighboring states have experienced
problems with dandelions in grain crops during the last few years and have observed that it is difficult to control with spring burndown applications.

One of the main concerns with dandelion, which is considered a simple perennial, is that plants are capable of reproducing from a branching taproot and from seed. The taproot can penetrate 6 to 18 inches deep into the soil profile. The roots of dandelion plants can compete effectively for soil moisture and contribute to the difficulty in controlling it with herbicides. The fact that plants produce numerous seeds (54 to 172 seeds/head and greater than 2,000 seeds/plant) that can be wind blown, also contribute to the problem with managing dandelion.

CONTROL: Timing of foliar - applied herbicides influences burndown control of dandelion. Fall treatments (before a killing frost) is preferred over those applied in the spring. The effectiveness of spring burndown treatments may be improved if they are applied when dandelion plants are flowering and are actively growing.

The combination of glyphosate plus 2,4-D will likely provide better control than either herbicide applied alone. Consult the product labels for recommended rates. The ester formulations of 2,4-D are preferred over amine formulations for controlling dandelion.

When using 2,4-D ester in burndown treatments, wait at least 7 to 14 days after application before planting field corn. The preplant interval between application of 2,4-D ester and planting soybeans is 7 days for rates up to 0.5 lb ai/A (1 pt/A of 4 lb ai/gal product) and 30 days for rates >0.5 lb ai/A up to 1 lb ai/A (>1 pt/A to 2 pt/A of 4 lb ai/gal product).

The addition of Canopy XL at 2.5 to 4.5 oz/A may also improve control of dandelion with spring burndown treatments for no-till soybeans. Since Canopy XL is no longer manufactured, growers may need to replace it with Synchrony XP (mp) at 0.75 oz/A for enhanced burndown control of emerged plants.

STORED GRAIN

STORCIDE™ II REPLACES STORCIDE™ FOR CONTROL OF STORED GRAIN INSECT PESTS

by Doug Johnson

The relatively new Storcide insecticide for use in stored grain has already undergone a change. Storcide was a mixture of chlorpyrifos-methyl (you might have recognized as Reldan) and cyfluthrin (which you might recognize as Tempo). You may remember our discussion this past season of how this product might affect grain going into international trade. The Storcide product label contained the warning: "Note: Cyfluthrin, a component in Storcide does not have CODEX MRLs. Please check with your grain handler before exporting." Although not a major problem for most producers, it still presented some degree of complexity to protecting our stored grain.

The reformulated product, Storcide II, does not contain cyfluthrin. This active ingredient has been replaced with deltamethrin. Both cyfluthrin and deltamethrin are synthetic pyrethroid insecticides and may be expected to perform in a similar way. However, deltamethrin does have established CODEX MRLs, and thus does not present a problem in international trade.

Although the Storcide label is still on the Gustafson web pages, I have been told that they will no longer handle the original Storcide, and there is little or none left. Gustafson will only distribute Storcide II.

HUMAN HEALTH HAZARDS OF INSPECTING STORED GRAIN

by Paul Vincelli, Extension Plant Pathologist & Larry Piercy, Extension Agricultural Engineer

Inspecting stored grain is important if grain quality is to be maintained until sale or use. Inspection is particularly important if holding grain through the summer months. Farmers who inspect grain must be aware of potential
health hazards when inspecting grain. Bins with moldy grain pose a health risk to those who climb in to inspect the grain or clean out molded grain.

1. INHALATION OF MOLD SPORES. If grain is moldy, farmers and workers who climb into their bins to inspect the grain may breathe large amounts of mold spores into their lungs. This can cause a variety of problems, ranging from temporary inflammation of the airway to a flu-like illness (fever, aches, pains, chills) with onset 4-8 hours after exposure. Permanent lung damage can develop in some individuals who become sensitized from repeated exposure to mold spores.

Be cautious: wear a respirator when climbing into the bin, especially if there is any risk of mold. A good respirator can often be purchased from local suppliers of building materials, auto body or other paints, etc. Paper mask identified as a “nuisance dust” mask with only one elastic strap provide almost no protection. A good fitting, disposable dust mask with two straps and an N95 or N100 rating on the mask should provide good protection for most workers. A cartridge type respirator with a rubber face piece and a N100 dust filter will provide better protection, if properly fitted to provide a good seal around the face. This respirator would be advisable for those who are more sensitive to dust exposure.

2. SUFFOCATION. A person buried by grain can suffocate within seconds. This can happen if a person probes “bridged grain”—a 1-2 foot layer of moldy grain with an empty space below (which developed when grain was unloaded). Probing a steep pile or wall of grain can also cause the grain to collapse and bury a person. Entering a bin of flowing grain for any reason can quickly lead to burial. It is also advisable to lock out the power before entry into the bin so no one else can start unloading while you are inside. All farmers who store grain should have a copy of the UK Extension Publication, “Aeration, Inspection, and Sampling of Grain in Storage Bins, AEN-45”.

ALFALFA
TIME TO ASSESS ALFALFA WEEVIL FEEDING DAMAGE
by Lee Townsend

This is the time to check established alfalfa fields for tip-feeding damage. Small alfalfa weevil larvae initially chew pin head-sized holes in folded leaf. Hole size and damage increase as the larvae grow. Fields with high weevil numbers will take on a gray or frosted appearance as defoliation increases and yields will be lower and of poorer quality. The trick is to check on weevils now and avoid an unpleasant surprise later.

FRUIT CROPS

STRAWBERRY FRUIT ROT CULTURAL CONTROL REMINDERS
by John Hartman

Strawberry fruit rot diseases make it difficult to produce high yields and quality berries in Springtime under typically moist Kentucky growing conditions. Strawberry producers need to manage strawberry diseases by providing a consistent and acceptable level of disease control with minimal fungicide use.

The following cultural practices are essential to best manage strawberry fruit rot diseases such as leather rot, anthracnose, and gray mold.
• Select a planting site with good soil drainage. Leather rot requires free water (saturated soil) in order to develop.
• Avoid the use of excess nitrogen fertilizer. Excess nitrogen promotes dense foliage that stays wetter longer and also results in softer berries that may be more susceptible to fruit rots.
• Weeds in the planting prevent air circulation and result in fruit and foliage staying wet for longer periods. Gray mold, in particular, is a more serious problem in strawberry beds with poor weed control compared with beds with good weed control.
• Straw mulch keeps berries from contacting the soil where the leather rot fungus overwinters. In addition, it aids in preventing infested soil from splashing up onto the berries.

• Remove old leaves and other plant debris from the bed to reduce the amount of fruit rot pathogen inoculum. Leaf removal at renovation is helpful. Removal of rotted fruit from the planting is probably not practical, but could be highly beneficial.

• Schedule irrigation so that foliage and fruit will dry as soon as possible. If diseases such as gray mold, leather rot, anthracnose, or angular leaf spot (bacterial blight) become established in the planting, overhead irrigation should be avoided.

• Avoid moving people (pickers) and machinery from a field or area that is infected to a clean or uninfected field so that fungal spores or bacteria are not transported on shoes, hands and clothing.

• Because strawberry fruits are very perishable, the following harvest and post-harvest practices should be considered.
  a) Pick berries as soon as they are ripe; avoid overripe berries.
  b) Pick fruit frequently and early in the day.
  c) Handle berries with care during harvest to avoid bruising.
  d) If possible, pick and remove rotted fruits from the field.
  e) Get the berries out of the sun as soon as possible.
  f) Refrigerate berries immediately (inform your customers).
  g) Market the berries as rapidly as possible.

Additional notes on fungicides for fruit rots. Remember that fungicides applied for gray mold control need to go on during bloom. Research clearly shows that growers who apply just two bloom sprays get as good control of gray mold as a full-season fungicide program. Sprays applied after bloom have relatively little effect, since infections often occur through the flowers. Late maturing varieties usually require more fungicide protection than early strawberries because warm, disease-favorable weather is more likely, and high levels of fungal inoculum are left over from the earlier varieties.

For commercial growers, suggestions of fungicides for strawberry fruit rot management, can be found in U. K. Cooperative Extension Publication ID-94 Midwest Small Fruit and Grape Spray Guide 2005, available at county extension offices.

FOREST & WOODLOT PESTS

COMMON OAK MOTHS FLYING
by Lee Townsend

Common oak moth flight was reported from Breckinridge Co last week. This caterpillar has been active over eastern and central Kentucky during the past 4 years where it has fed heavily on white oak. The caterpillars, which move like inchworms, have brown bodies with tan to black blotches on the sides. Their backs are checkered with diamond-shaped markings and slanted lines. Full grown caterpillars are about 1-1/4 inches long.

There is one generation each year with the caterpillars active from May to June. Common oak caterpillars seem to be able to feed on many kinds of oaks but prefer white oaks. In many cases, trees can be severely or completely defoliated. While a single defoliation should not adversely affect established, healthy trees, previous droughts or other stresses can increase the impact of this damage. In general, an insecticide application is neither practical nor recommended, cultural measures to promote tree health are more likely to be beneficial.

LAWN & TURF

RAMORUM BLIGHT: DECIDING WHAT ORNAMENTAL PLANTS TO SAMPLE FOR P. ramorum.
by Patricia B. de Sá
Phytophthora ramorum can infect oaks, causing the symptoms that are typically associated with Sudden Oak Death (S.O.D.). On oak trees the disease is fatal, and the symptoms of S.O.D. are bleeding cankers on the tree trunk that expand and girdle the stem leading to death of the tree crown within a few years.

P. ramorum can also infect many other plants, causing symptoms on leaves and shoots, and the diseases associated with this pathogen on plants other than oak trees are called Ramorum leaf blight and Ramorum shoot dieback, although cankers in the inner bark of stems are occasionally seen on some plants like viburnum and rhododendron. Infected plants often shed symptomatic leaves and the pathogen can survive on the plant for a long time without killing it. The infected plant does not necessarily die and it may look ugly at times following periods of mild, moist weather, environmental conditions that are favorable to pathogen development. Infected plants are a source of spores that can move in water in rain splash and irrigation water and infect other plants and oak trees. Ramorum leaf blight symptoms initially appear as water soaked lesions on the leaves that turn brown and necrotic; they may be relatively small or may be large rounded lesions with uneven edges that tend to expand along the mid rib of the leaf. On camellias and rhododendrons necrotic lesions may be seen on the edge of the leaves where water and spores accumulate. P. ramorum spreads through the plant and can move from the leaves into the stem and upwards or downwards in the stem. It can also move from the stem into the leaves. On the stems, it can cause stem necrosis. Ramorum tip dieback is characterized by wilting and necrosis of the tip of the stem and twig dieback; leaf bud death may also be seen.

During 2003, 2004 and early 2005 infected ornamental plants, particularly camellias, were shipped from nurseries in California across the country and by 2005, nurseries in 22 states were found to have infected plants. There are many common Phytophthora species that cause similar symptoms and symptoms may vary with the host and the climate conditions. Not all nursery plants are infected with P. ramorum, however, a few plants are at risk for infection and the plants of major interest at this time are: camellia, rhododendron, viburnum, pieris (or andromeda) and mountain laurel (also called kalmia). P. ramorum can only be identified correctly using laboratory assays, but you can pre-screen your recently acquired ornamental plants and request help if you think that the symptoms you see are similar to Ramorum leaf blight and Ramorum tip dieback.

Phytophthora ramorum and Sudden Oak Death (S.O.D.) have not been found in Kentucky and in order to protect Kentucky oak trees and forests it is important to detect P. ramorum early and eradicate it quickly.

The check list below was adapted for Kentucky from a list prepared by L. Chalker-Scott; it can help you determine if an ornamental plant needs to be sampled. Keep in mind that at the end of the growing season you will see many leaf spots on plants, not every spot or blotch is caused by Phytophthora ramorum, and that this check list does not apply to oak trees.

1. Does the plant display foliar blight or shoot dieback disease symptoms?
   a. No – no need to sample the plant.
   b. Yes – go to 2.

2. Is the plant a recently acquired camellia, rhododendron, viburnum, pieris or kalmia?
   a. No – go to 3.
   b. Yes – go to 5.

3. Is the plant near a recently acquired camellia, rhododendron, viburnum, pieris or kalmia?
   a. No – no need to sample the plant.
   b. Yes – go to 4.

4. Is the plant on the host list for P. ramorum? (view list on: www.aphis.usda.gov/ppq/ispm/sod)
   a. No – no need to sample the plant.
   b. Yes – go to 5.

5. Was the camellia, rhododendron, viburnum, pieris or kalmia purchased after December 2000?
   a. No – no need to sample the plant.
   b. Yes – a sample should be collected for testing.
If you have reached 5b contact your local County Extension Agent for horticulture or agriculture for advice and sample collection. They can determine if a sample should be collected and sent to a Plant Disease Diagnostic Laboratory of the University of Kentucky for free testing for *P. ramorum*.

For more information on *P. ramorum* and Sudden Oak Death you can visit these websites:

- The Southern Plant Diagnostic Network: http://spdn.ifas.ufl.edu/sudden_oak_death.htm

**SHADE TREES & ORNAMENTALS**

**SUCCULENT OAK GALLS**

by Lee Townsend

Roly poly galls, also called succulent oak galls, look like succulent green grapes growing out of oak leaves. The galls often are flecked with green and rattle a little when shaken. The rattle comes from the seed-like grub of a small wasp that is the landlord of this small home. The wasp larva gains protection and nutrition from the harmless plant growth. The tale of this tiny wasp has not been completely unraveled but it is possible that this leaf gall form alternates with a twig gall.

Oaks can host a wide range of gall-forming creature, most of which produce odd structures, arouse curiosity of the observant, but fortunately do not harm tree health. See Entfact 408 for more information. http://www.uky.edu/Agriculture/Entomology/entfacts/trees/ef408.htm

**HOUSEHOLD**

**MANAGING CARPENTER BEES**

by Mike Potter

Large, black bees have been hovering around eaves, decks, and wood siding of clients’ homes and outbuildings. These are probably carpenter bees searching for mates and nesting sites. Carpenter bees cause cosmetic and structural damage to wood. They can also be intimidating and have the potential to inflict painful stings. *The Problem-* Carpenter bees are similar in appearance to bumblebees, but have different nesting habits. Bumblebees generally nest in the ground, whereas carpenter bees tunnel into wood to lay their eggs. Bare, unpainted, weathered softwoods are preferred especially redwood, cedar, cypress and pine. Painted or pressure-treated wood is much less susceptible to attack. Common nesting sites include eaves, fascia boards, siding, wooden shake roofs, decks and outdoor furniture.

Carpenter bees overwinter as adults in old nest tunnels. After mating, the fertilized females excavate galleries in wood, laying their eggs within a series of small cells. The cells are provisioned with a ball of pollen on which the larvae feed, emerging as adults in late summer. The entrance hole and tunnels are perfectly round and about the diameter of your finger. Coarse sawdust, the color of fresh cut wood, is often seen beneath the entry hole, and burrowing sounds may be heard within the wood. Female carpenter bees may excavate new tunnels or enlarge and reuse old ones. Serious damage can result when the same piece of wood is worked year after year.

Males are often aggressive, hovering in front of people who are around the nests. The males are harmless, however, since they lack stingers. Female carpenter bees can inflict a painful sting, but seldom will unless handled or molested.

*The Solution-* The best time to control carpenter bees is before the tunnels are fully excavated. For homeowners, liquid sprays of Sevin or a pyrethroid (e.g., Bayer Advanced™ Home/Lawn & Garden Insect Killer, Spectracide® Triazicide/Bug Stop, Ortho® Home Defense System/Termite & Carpenter Ant Killer) can be applied directly into nest openings, or broadcast sprayed as a deterrent onto wood surfaces attracting large numbers of bees. The
broadcast spray approach is often warranted when carpenter bees are riddling siding on a barn, wood shake roofs, decking or similar large expanses of wood. Broadcast treatment is best accomplished with a pump up or hose end sprayer, targeting wood surfaces that are most favored by the bees (fascia boards, joist ends of redwood decks, etc.). Residual effectiveness of such applications is only about 1-3 weeks, so the treatment may need to be repeated. Individual holes which are already present can also be treated with a wasp and hornet aerosol spray or insecticide dust (e.g., Sevin, DeltaDust), directed into the nest opening. Although carpenter bees are less aggressive than wasps, female bees provisioning their nests will sting. Consider treating at dusk or while wearing protective clothing.

Leave the holes open for a few days after treatment to allow the bees to contact and distribute the insecticide throughout the nest tunnel. Then plug the entrance hole with a piece of wooden dowel coated with carpenter’s glue, wood putty, or other suitable sealant. This will protect against future bees using the old tunnels, as well as moisture intrusion and wood decay.

Carpenter bees normally will not tunnel into painted wood. Therefore a more permanent solution is to paint unfinished wood surfaces, especially those with a history of being attacked. Wood stains and preservatives are less reliable than painting, but may provide some degree of repellence versus bare wood. To further discourage nesting, garages and outbuildings should be kept closed when carpenter bees are actively searching for nesting sites. The annoying flying and nesting habit usually subsides by the end of May.

PESTICIDE NEWS & VIEWS

RESISTANCE MANAGEMENT GROUPING CODES NOW APPEARING ON SOME PESTICIDE LABELS
by Ric Bessin, Kenny Seebold, Doug Johnson, and Lee Townsend

Resistance can develop in pest populations that are exposed to multiple applications of pesticides which belong to the same class; that is, where they attack the pest (mode of action). One of the keys to preventing resistance is to rotate classes of pesticides used against specific pests. This means that the applicator must be able to look at the active ingredient(s) in a product and recognize the class(es) represented, and then find the information.

A numbering system has been developed to make this task easier. Some companies have begun to place mode-of-action classification codes on the front panel of their pesticide labels. These designations appear as a three part box, shown in the examples below:

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<th>GROUP</th>
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<td>GROUP</td>
<td>FUNGICIDE</td>
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<td>11</td>
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The classification schemes for insecticides and fungicides provide growers with an easy to recognize numerical group (or groups in the case of more than one active ingredient in a product). Users only need to read the numerical group on the label. For example, two different pesticides with the same numerical group belong to the same chemical class or classes that share the same mode of action. Those with different grouping codes attack the pest or disease in different ways. Applicators can use this information to make better pesticide selection decisions to manage pesticide resistance by avoiding the overuse of a single class of pesticide.

Generally, the more frequently a grower sprays a pesticide or pesticides with the same mode of action to control a pest problem, the quicker a pest is likely to develop resistance. Many factors control the rate of pesticide resistance development and most of those are out of our control (development rate and number of annual generations of the pest, migration rate from susceptible populations, background levels of resistance). Judicious use of pesticides and alternation of chemicals with different modes of action is vital when repeated applications are needed.
Keys to using this system correctly:

- Read and recognize the numerical groups on the pesticide labels. Those with different designations have different modes of action.
- To delay and/or prevent the development of resistance by pests, growers must avoid the repeated use of the same pesticide or pesticides that share the same mode of action. Users need to alternate different pesticide classes periodically when repeated sprays are needed. Alternate to products from different numerical groups for repeated applications.
- Do not tank mix to pesticides from the same numerical group (same mode of action).
- As always, only use pesticides at labeled rates and according to labeled spray intervals.

Other factors that delay the development of pesticide resistance:

- Always time pesticide sprays when they will do the most good. Most pests have a stage when they are most vulnerable. Don’t wait too long to begin applications of pesticides. In the case of fungicides, “rescue” applications of chemicals to severely diseased fields can lead to the development of resistance in pathogen populations (more of the pathogen population is exposed to the fungicide and therefore the odds of selecting for resistant individuals go up).
- Take an integrated approach to pest control and rely on proper cultural controls, crop rotation, resistant varieties, and natural enemies of pests.
- Use pest and weather monitoring and economic thresholds as guides when making decisions to make pesticide applications.
- Try to preserve natural enemies of pests through the use of selective pesticides or targeted applications.
- Mix and apply pesticides carefully to ensure correct dosage and coverage. Sprayers must be calibrated regularly to account for nozzle wear. Use the proper spray volumes and pressure to ensure adequate coverage.
- Eliminate crop residues after harvest when practical to remove overwintering sites for pests.

**DIAGNOSTIC LAB-HIGHLIGHTS**

by Julie Beale and Paul Bachi

Recent samples in the Diagnostic Laboratory have included Rhizoctonia damping off, Pythium root rot and sunscald on tobacco seedlings; fertilizer burn on geranium; alkalinity problems on petunia; wet feet (over-watering problems) on container-grown magnolia; leaf scorch on strawberry (Diplocarpon); black root rot and iron deficiency on holly; and white pine decline.
INSECT TRAP COUNTS
UKREC, Princeton KY

April 8-15, 2005
Black Cutworm .................................................................0
True Armyworm ..............................................................13
Corn earworm .................................................................2
European corn borer .........................................................0

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.

Lee Townsend, Extension Entomologist

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