



# KENTUCKY PEST NEWS

**ENTOMOLOGY • PLANT PATHOLOGY • WEED SCIENCE**

On line at - <http://www.uky.edu/Agriculture/kpn/kpnhome.htm>

Number 918

May 29, 2001

## ANNOUNCEMENT

- New insecticides for armyworm control in pastures
- True armyworms make another appearance

### TOBACCO

- Current blue mold status
- Early season tobacco insect pests

### FORAGE

- Ergot risk in tall fescue

### SOYBEAN

- Increased doublecrop soybean yields may be possible

## WHEAT

- An ounce of prevention is worth a pound of cure for managing ryegrass

### LAWN & TURF

- Take all of creeping bentgrass
- Red thread

### SHADE TREES & ORNAMENTALS

- Fire blight - what now?

### HOUSEHOLD

- It's mosquito season !

### DIAGNOSTIC LAB - HIGHLIGHTS

### INSECT TRAP COUNTS

## ANNOUNCEMENTS

### NEW INSECTICIDES FOR ARMYWORM CONTROL IN PASTURES

(Frankfort) The U.S. Environmental Protection Agency has granted special registration for two insecticides to combat armyworms in pastures and hayfields in Kentucky, the Ky Department of Agriculture has announced.

The insecticides are Pounce 3.2 EC (FMC Corp.) and Confirm 2F (Rhom and Haas Co.). Both are Restricted Use pesticides. Cattle can be present during application, if necessary, when Pounce is applied and they may graze fields after treatment. However, pastures sprayed with Pounce cannot be cut for hay during the remainder of the season. Pastures sprayed with Confirm 2F can be harvested for hay after a 14-day wait.

Applicators must have a copy of the appropriate state (24-c) label for Pounce or the Crisis Exemption label (Section 18) for Confirm. These are available from the pesticide dealer when the products are purchased.

### TRUE ARMYWORMS MAKE ANOTHER APPEARANCE

By Doug Johnson

Second generation moth flight of the true armyworm has begun at the REC in Princeton, KY. The weekly trap catch of moths on Friday May 25 was 68 moths / trap / week, up from 7 on Friday May 18. Already on May 29 there are about 150 moths in the trap. A daily catch rate of this size could produce a weekly trap count of 262 moths / trap / week this Friday (6/1). This number is not quite to the first generation maximum of 398 moths / trap / week counted on Apr. 13. So what does this tell us?

There are several important points to remember.

! This data represents just one location in Kentucky.

! Insect development rate is almost completely dependent upon temperature.

So, moth flight in other locations will begin on different dates than at Princeton, depending upon temperature and the timing

of the first generation.

! Moth flight is just an indication of the beginning of the generation.

It is not the moths that cause damage it is the caterpillars (worms). Before worm feeding begins the moths must mate, and lay eggs; the eggs must develop and hatch. All of these processes are dependent upon temperature.

! The lower limit of temperature that will support armyworm development is about 50° F

Most of our daily temperatures should be above 50° F during the second and subsequent generations.

! The upper limit of temperature that will support armyworm development is about 85° F.

Above this temperature armyworms should suffer increased mortality, and reduced development.

We can use degree days to estimate how long after a moth flight occurs it will be before the worms show

up and start to feed. However, degree days are only estimates. Additionally, they deal with the distribution through time of an insect population's development, so you will not get just a single date for an event.

If we look at the date of the peak moth flight of the first generation (Apr. 13, 2001) and the general dates we observed massive worm feeding (May 7 to 20, 2001) we find that peak feeding occurred about three to four weeks later. Even though this is when the infestations were noticed, I can assure you that the worms were in the field and eating at least a week before this, so when thinking about when to go looking for second generation worms, two to three weeks after moth flight is more appropriate.

However, insects are driven by temperature not by calendar dates. What is important is the amount of heat units, termed degree days (DD) that accumulated during that time. From the literature we find that this development of a complete generation should be about 1035 DD's. The DD total from Apr. 13 (peak 1st Generation) to May 28 (beginning 2nd Generation) is 769 so we are about right on schedule.

The number of DD from Peak moth flight to Peak

worm appearance should be about 239 DD and the number of DD from Peak moth flight to Peak pupation (worm disappearance) should be about 739. In Princeton the two weeks of maximum worm activity (May 7- 20) were about 362 to 641 degree days from the peak moth flight. Again, about the right timing. Although most people did not observe many worms before May 7, they were most certainly there. This is borne out by the number of individuals who did not find the problem until after the damage was done. Likewise, though problems tapered off there, were worms present after May 20th. Although not as exact as we would like, DD's do provide us with some estimate of when the next set of worms might appear.

Now where does that leave us? We know that second generation moth flight is beginning. We know that temperatures will be warmer from the time of this second generation moth flight to the appearance of the worms than they were for the first generation. We don't yet know when moth flight will peak or what the daily temperatures will be for the next month. If you use only calendar dates we should begin to look about two weeks from now.

If we begin the DD counter with last Friday, May 25th (when we noted the first increase in moth trap catch) we are currently at 66 DD from the beginning of the moth flight. If we use temperatures from 2000 as a model for future temperatures then the first worms from the earliest moths should appear about June 4th (235 DD from May 25th). This would be the earliest of the early worms and would likely be very tiny, few in number, hard to find, and do little damage.

A more useful number will be the worm hatch from the peak moth flight. The peak moth flight is likely to occur this week or next week. Again using 2000 temperatures the early hatching worms from June 1<sup>st</sup> or June 8th should be present about June 11 or June 16th. **So, it appears that we should begin scouting for worm pressure about the end of the first week of June.**

These estimates only concern WHEN worms will appear not IF or WHERE they will appear. So, the estimate simply tells us when to go look for the pest NOT if the pests will be there.

True armyworm in Kentucky generally has three to

four generations per year this is not new. Additionally, it is not at all unknown to have spring (first generation) worm populations large enough to require control. Generally, these cases are in small grain fields and corn planted into small grains or fields containing grass weeds. However, before this year it has been virtually unknown for second and subsequent generations of true armyworms to cause problems in crops. But, so far as I know we have never had a first generation outbreak as large as the one we have seen this year. So, we best keep our eyes open.

So, what is to be done?

- ! First, be aware that a second generation of true armyworm is now developing.
- ! Second, be prepared to go to your fields of grass crops about the second week of June and look for this insect,
- ! Third, be prepared to make an insecticide application if necessary.

For forage / cattle producers this will include:

- 1.) understanding what products are available,
- 2.) Knowing the restrictions for application on or around cattle,
- 3.) Knowing time delay required before returning cattle to treated fields,
- 4.) Knowing the allowance to harvest hay from the treated fields. Forage and cattle producers should read the Announcements section of this Kentucky Pest News to see information on the new state local need and emergency pesticide labels.

Producers of corn and small grains will have fewer problems with product restrictions, and more products from which to choose.

#### **References:**

Phenology Model Database - Armyworm. Univ. CA. Statewide Integrated Pest Management Project. [www.ipm/ucdavis.edu/PHENOLOGY/armyworm.html](http://www.ipm/ucdavis.edu/PHENOLOGY/armyworm.html)

## **TOBACCO**

### **CURRENT BLUE MOLD STATUS**

**by William Nesmith**

**Situation:** Weather during the past week in most of Kentucky was ideal for blue mold to develop if the

fungus were present. I urge growers and county agents to be actively scouting for the disease, because we need to move quickly if it is present. Be especially watchful of float beds and greenhouses. Target spot, Pythium root rot, and blackleg are even more likely to be present, so even if those are present, check carefully for blue mold. Be especially watchful of crops that involved southern transplants, but do not limit your scouting to those crops, because it could have moved in on the air, overwintered, or by cultivated or ornamental tobaccos from other regions. Interstate movement of transplants (cultivated and ornamental) is still occurring this week, and County Extension Agents report that southern sources are involved.

I also urge growers to remain alert to the current status of blue mold in their community, especially during the next 10 days, because the status could change quickly.

#### **CONTROLS:**

**Transplants:** Because they are needed for other diseases as well, preventive fungicide spray programs should remain in place at all tobacco transplant production sites - greenhouses, float beds, plant beds, and distribution/holding sites. Remember that Ferbam can be use on small seedlings, while Dithane may cause injury if applied to plants with leaves smaller than dime-size. However, most plants are large enough to tolerate Dithane, which will provide better control than Ferbam in the larger plants. See issue 908 of Kentucky Pest News (March 12, 2001) for more specifics on chemical options for disease control in tobacco transplant production. Terramaster 35 W is labeled for Pythium control in float beds and greenhouses, at the rate of 2 oz/100 gallons of float water. Also, promptly destroy all transplants once the transplanting season is over, but keep them protected with fungicides until they are destroyed. Recall that during the 1999 drought year when we let blue mold build up in abandoned float plants in the dry areas after the transplanting season was over, only to cause serious problems for those eastern and northern counties that received some timely rains. Folks, let's all appreciate that a key to the management of blue mold is centered around the tobacco community managing blue mold in the transplants - and it does not stop with transplanting!

**Field:** Growers should be prepared to spray in a

short order should a watch or warning be issued for your community, and be incorporating cultural controls. If you cannot remain informed, then start your Acrobat MZ spray program now. See issue 910, April 2, 2001, Ky Pest News for those guidelines and the fungicide options. Also, see issue 913, April 23, 2001, Ky Pest News for information on Actigard for blue mold prevention. Some of our crop is approaching treatment size, but much is too small for this treatment now. Correctly used, Actigard can be a valuable tool, but when poorly used it can cause problems. Do not apply it too early or to stressed plants!

Growers should also be concentrating on black shank controls - see issue 915, May 7, 2001 for details. Areas that received significant moisture and multiple rains last week, followed by warm weather, probably have strong black shank activity occurring already in infested fields. The Ridomil Gold and Ultra Flourish used for black shank control, will also protect against the mefenoxam-sensitive strains of blue mold.

### **EARLY SEASON TOBACCO INSECT PESTS** **By Lee Townsend**

Cutworms are potential problems in tobacco fields where weed growth provided sites on which black cutworm moths could lay eggs. Orthene, as a setter water application, should provide good (about 80% to 90%) protection of transplants. Lorsban can be used as a preventive preplant incorporated application. The 4E formulation applied as a broadcast spray will be more effective than if it is impregnated on fertilizer and applied.

If cutworm damage is seen in fields that already have been set, Orthene can be used as a rescue treatment over the crop. Results will be best if the cutworms are feeding on leaves in contact with the soil surface. This application will not be effective on cutworms feeding entirely below ground.

Wireworm injury may be found in some fields. The first noticeable symptom is wilting of the plant, often followed by collapse and scalding. Carefully dig the injured plant to expose the stem and look for chewing injury or an entry hole in the side of the stem. Extensive damage to the stem, girdling, can kill the plant. Plants with an entry hole only can survive some tunneling damage and grow,

although they will be stunted.

There is no rescue treatment for wireworms. They are active below ground and no surface-applied insecticide will reach them. It is likely that a wireworm will remain at and feed on the plant it attacked without moving to another one. Most of the species that have caused problems in the past finish their feeding and pupate in early June.

## **FORAGE CROPS**

### **ERGOT RISK IN TALL FESCUE** **by Paul Vincelli**

Recent humid, rainy weather with moderate temperatures during the period of flowering of tall fescue may have been favorable for infection of the flowers by the ergot fungus *Claviceps purpurea*. *C. purpurea* is related to the fungal endophyte of tall fescue, and both are capable of producing potent toxic alkaloids that affect animal health (and human health, if eaten).

Readers should be absolutely clear that ergot was not the cause of the recent problems with Mare Reproductive Loss Syndrome (MRLS). This conclusion is based on several reasons: 1. ergot sclerotia (described below) could not be detected in any pasture grass inspected at horse farms; 2. ergot alkaloids could not be detected in seedheads or inflorescences of any grass sampled from horse pastures; and 3. the weather in Central Kentucky through April and mid-May (the period of concern relative to MRLS) was too dry to promote activity and infection by *C. purpurea*. However, since the subject of animal poisoning is on many people's mind, this is an important "teachable moment" to educate about ergot risks in Kentucky pastures.

The ergot fungus infects only the flower parts of certain grasses, and replaces the seed with "ergots". Ergots are survival bodies of the fungus that are easily recognized with the naked eye. They look like dark brown to black, curved cigars measuring 1/8 inch to 3/8 inch. They are longer than grass seed, so they stick out beyond the glumes. If you cut them open, you'll see that they have a gray to whitish interior.

Early-flowering fields of tall fescue probably escaped infection by *C. purpurea* because of the dry weather up until mid-May (although "hot-spots" of

ergot may appear in these fields around farm ponds). However, my observations are that some fields were in flower during the past 10 days; fields clipped early may experience postponed flowering. These may develop ergot contamination in the seedhead if not cut before it approaches maturity.

### **Management**

Preventing livestock from consuming a significant dose of ergot sclerotia is the only reasonable course of action.

### **Pasture**

If seedheads form, inspect them for ergots. If they are found, mow before turning livestock out into the pasture. Mow the seedheads along the fencerow, as well.

### **Hay**

If the seedheads are dry before harvesting, the ergot sclerotia will often fall to the ground during cutting/tedding/baling. However, if the seedheads were still somewhat green when cut, the sclerotia can remain attached to the seedhead, and will end up in the bale. In harvested hay, ergot sclerotia constitute a very small fraction of the total forage in the bale. Because of this, the risk from feeding these bales is low. However, repeated feeding of infested hay into a feedbunk can lead to accumulation of the ergot sclerotia at the bottom of the bunk. Livestock may then consume a high dose of sclerotia when they feed on this residue.

### **Seed Production**

Where tall fescue is being grown for seed, avoid feeding screenings that may be contaminated with ergot sclerotia. Seed-cleaning operations concentrate the sclerotia and can pose a great hazard if fed to livestock.

## **SOYBEAN**

### **INCREASED DOUBLECROP SOYBEAN YIELDS MAY BE POSSIBLE**

**by Don Hershman**

There are many advantages associated with planting doublecrop soybean, but one main disadvantage is substantially reduced yield compared to full-season soybeans. There are numerous agronomic reasons for reduced yields in doublecrop soybean. The most notable of these is a reduced period of vegetative growth due to late

planting. Another less publicized factor limiting yields in doublecrop soybean is soybean viruses. The most common of these virus diseases are soybean mosaic virus (SMV) and bean pod mottle virus (BPMV). SMV and BPMV are transmitted by aphids and bean leaf beetles, respectively. SMV is also seed transmitted, albeit usually at relatively low levels

If soybean becomes infected with soybean mosaic virus (SMV) alone or in combination with bean pod mottle virus (BPMV) prior to flowering, the possibility that yields will be reduced is very high. Yield losses can be especially severe (>60%) in plants doubly infected with both SMV and BPMV.

For SMV, yield losses will begin to accrue if only 18 % of plants in a field become infected prior to flowering. This is an important point since field studies in Kentucky have determined that SMV incidence often exceeds 25% in late plantings. The incidence of SMV in full-season crops is also usually high, but infections typically occur during the reproductive stages - a time when virus infection has little impact on yield. The main reason for the difference in time of infection between early- and late-planted crops has to do with the biology of the aphids which transmit SMV. That is, peak aphid populations and activity peak occur during late July to early August. By this time of the year, full-season soybean crops are usually well into the reproductive stages. In contrast, doublecrop soybean (and other late-planted soybean crops) are almost always vegetative during this same period. Thus, virus levels can be high in both early- and late-planted crops, but yields will only be impacted in the latter.

So what is a farmer to do? Not plant soybean late - no doublecropping? No, these options need not be considered. Rather, we recommend considering the use of SMV-resistant varieties when late-planting is practiced. Studies from 1989-94 found that SMV resistant varieties provided a 12% yield advantage over SMV-susceptible varieties in late-planting situations. Thus, using these varieties when doublecropping may help you to boost yields. The only real hitch is that the number of known SMV-resistant varieties is small and few are resistant to the soybean cyst nematode (SCN). Public varieties with proven resistance to SMV resistance include CF 492, Clifford, Holladay, and Hutcheson; none of these varieties are resistant to SCN, so caution must

be exercised. Many other varieties, some with SCN resistance, are currently being evaluated for SMV resistance by scientists in both public and private sectors. As such, representatives from larger private seed companies may have some suggestions on which of their varieties appear to have acceptable resistance to SMV. In addition, as soon as I have confirmation of new SMV-resistant varieties, I will post along that information in future Kentucky Pest News articles.

NOTE: Data and research referred to in this article are the result of studies conducted by University of Kentucky scientists in Department of Agronomy: T. Pfeiffer, Q. Ren; and Department of Plant Pathology: S. Ghabrial and M. Hajimorad (visiting scientist).

## **WHEAT**

### **AN OUNCE OF PREVENTION IS WORTH A POUND OF CURE FOR MANAGING RYEGRASS**

**by James R. Martin**

Although Italian ryegrass tends to complete the development of mature seed slightly later than wheat, it can produce viable seed by the time wheat is ready to harvest. Since these two species are similar in their maturity, it may be important to take care of a few chores to help limit the spread of ryegrass during the wheat harvesting process. This includes mowing waterways and field borders ahead of wheat harvest, particularly where ryegrass occurs. Combines may collect ryegrass seed from infested areas and eventually spread it out into the field where it will develop in subsequent crops.

Sanitation of harvesting and mowing equipment is also important. Taking a few minutes to clean key areas of the combine or bushog before going to non-infested areas may pay big dividends for future crops. Harvesting or mowing ryegrass-infested fields last would also be ideal.

Growers who want to limit germination of ryegrass seed by spraying Roundup UltraMax (or other glyphosate formulations) as a labeled preharvest treatment in wheat may be disappointed in the results. While this approach may seem like a good strategy for preventing the spread of ryegrass, research has shown that it is not effective. Consequently, once ryegrass is left uncontrolled by

early-season conventional methods in newly infested wheat fields, it will likely to produce seed that remain viable for future crops.

## **LAWN & TURF**

### **TAKE ALL OF CREEPING BENTGRASS**

**by Paul Vincelli**

A case of take-all of creeping bentgrass came in last week. This disease causes patches of 1-3 feet in size of wilting and dying of the grass, often with healthy grass in the center (giving the patch a “frog-eye” appearance). The disease is only a problem on creeping bentgrass.

For management, avoid using topdressings with a pH above 6.0, which can enhance symptoms. Maintain adequate levels of potash and phosphate, and reduce thatch. Maintain the soil pH between 5.5 and 6.0. Use ammonium sulfate during spring and autumn, which helps to lower the pH of the rhizosphere, the soil immediately around the root. Substitute another nitrogen source with less burn potential during summer but minimize the use of nitrate forms of nitrogen since this can enhance the disease. Wash ammonium fertilizers off leaves if applied when temperatures will exceed 80°F to prevent foliar burn.

Infections take place during the autumn, progress during warm periods in winter, and may continue somewhat during springtime. Studies suggest that the most important time to treat with fungicide is from mid-September into early November. One or more springtime applications may be necessary under high disease pressure. Sprayed fungicides should be applied in at least 5 gal water/1000 ft<sup>2</sup> or followed immediately (before they dry) with 1/16 to 1/8 inch of irrigation, in order to wash fungicide into the root zone. Granulars should be applied when the turf is dry and then watered in. Heritage has provided excellent results in the research I have seen; Banner and Rubigan have also been very good. See product labels for specifics on application timing. High labeled rates have been needed for best results in several studies.

### **RED THREAD**

**by Paul Vincelli**

Red thread disease was very active in perennial ryegrass last week. Look for the red, thread-like

fungal structures at the ends of blighted leaves. Although red thread is often associated with low-fertility turf, this disease can be very active in “hot-spots” of turf that has received adequate fertility. The disease does not attack the crown, so fungicide treatment is generally not necessary except in the highest-maintenance turf.

## **SHADE TREES & ORNAMENTALS**

### **FIRE BLIGHT - WHAT NOW?**

**by John Hartman**

Fire blight symptoms are appearing in flowering pears (i.e., ‘Bradford’ and ‘Aristocrat’ pears) in nurseries and landscapes throughout Kentucky. Many backyard apples and crabapples are also affected. The plant disease diagnostic laboratories have been reporting high numbers of fire blight samples from apples and pears for the last several weeks. In addition, County Extension Agents have been inquiring as to how to best advise their clients with blighted pear and apples. Many growers wonder why the disease is widespread and yet sporadic this year.

- Fire blight is widespread because for much of this spring, conditions were ideal for infections, especially during bloom when primary infections take place. Frost in some areas may also have played a role. Readers may recall comments made in Kentucky Pest News April 2, 9, and 30.
- The disease is sporadic because not all trees faced ideal fire blight conditions this spring. With an April drought occurring in some areas, weather may have been too dry for good development of bacterial populations and for invasion of the bacteria into flowers. Small differences in microclimate based on the tree location or exposure can make a critical difference in disease potential. In addition, timing of bloom in relation to the weather affected whether or not fire blight would be a problem.
- Fire blight has been a threat over an extended period because some trees produced many “trailing blooms.” Indeed, some apple trees are still putting out an occasional bloom which would be ripe for infections now. In nurseries, dormant liners may be placed in the field over a period of several months and some of these liners may bloom, thus extending the primary infection period even more.

Growers and gardeners with infected trees are often tempted to remove infected branches. In many cases, this would be the wrong strategy, because removing branches can encourage new shoots to develop and these new shoots would also be susceptible to new infections. If fire blight strikes are discovered early, before leaves have turned completely brown, timely removal of infected shoots can help slow the spread of the disease. However, most growers do not discover the disease early enough for this to be helpful. So what should one do with infected trees now?

- Most backyard growers should just let the disease run its course, allowing the tree defenses to stop fire blight spread within the tree. Dead shoots and branches should be removed in winter when there is little chance of spreading the disease.
- What should growers do if they feel compelled to cut out fire blight infections? If pruning is begun after obvious symptoms appear, cut back to a healthy internode of at least two-year-old wood, leaving a stub several inches long. Rely on the tree's natural defenses to prevent further movement into the branch. If needed, paint the stub with bright paint to make it more obvious. This stub can then be safely removed in the winter. Leaving infected stubs reduces the chances for development of undesirable water sprouts in response to pruning.
- The reason not to prune infected branches back to a spur or crotch in summer is because it may not be noticed in winter and could be overlooked. It should not be necessary to sterilize cutting tools between cuts if only blighted shoots are being removed.
- Do not engage in normal summer pruning and training at the same time as fire blight removal without wiping the cutters with sterilizing solutions like 70% alcohol or 10% bleach. Don't forget to remove the infected stubs along with dead shoots and cankers next winter.
- Do not apply chemical controls such as streptomycin. They are only effective if used during the normal bloom period.
- Remove trailing blooms to prevent late spring and summer infections.

## HOUSEHOLD

### IT'S MOSQUITO SEASON !

by Mike Potter

Abundant rainfall has 'jump-started' the mosquito season in Kentucky. To date, there have been no reported cases of West Nile Virus, the mosquito-borne disease that killed and sickened many people recently in the Northeast. Health officials in Kentucky are monitoring for the virus, but are yet to find any infected birds (the primary wild host) or virus-carrying mosquitoes. Nonetheless, mosquitoes remain a perennial, warm-season pest for which there is no easy solution. As summer approaches, there will be an abundance of misinformation about what works and what doesn't.

#### ***Where Do They Come From?***

Mosquitoes need quiet, non-flowing water for their development. In Kentucky there are two primary groups of mosquitoes, *Culex* and *Aedes*. Mosquitoes of the *Culex* group generally lay their eggs on the surface of water in rain barrels, bird baths, tin cans, old tires, cisterns, roof gutters and any other container that holds water. Mosquitoes of the *Aedes* group lay their eggs at the base of vegetation bordering streams or in low-lying areas subject to flooding. *Aedes* mosquitoes can also deposit their eggs above the water line in old tires and other water-holding containers. Their eggs can withstand long periods of dry weather between bouts of rainfall, which is why mosquitoes can be abundant, even in the midst of drought.

Mosquitoes develop rapidly, transforming into biting adults in as little as one week. A neglected bird bath or boat bottom allowed to accumulate water can produce hundreds of new mosquitoes each day.

#### ***What Can I Do About Them?***

Eliminate Breeding Sites - The best way to control mosquitoes is to find and eliminate their breeding sites. This is often easier said than done, since breeding locations are not always obvious. Eliminating areas of standing water, such as swamps or ditches, may require community-wide effort. Nonetheless, homeowners can take several steps to prevent mosquitoes from breeding on their property.

1. Dispose of old tires, buckets, plastic sheeting or other containers that collect and hold water. Do not allow water to accumulate at the base of flower pots or in pet dishes for more than a few days. Clean debris from rain gutters and remove any standing water on patios or flat roofs.

2. Change water in bird baths and wading pools at least once a week. Consider stocking ornamental ponds with predacious minnows. Known as mosquito fish, these minnows are about 1 - 1 ½ inches in length and can be purchased or seined from streams and creeks. Another approach with ornamental ponds is to apply a "target-specific" insecticide which prevents mosquitoes from developing in the water. Products containing the insect growth regulating agent, methoprene (Altosid®), or the bacterium, *Bacillus thuringiensis* var *israeliensis* (Mosquito Dunks®, Bactimos®, Vectobac®), are essentially harmless to fish and other aquatic organisms. They are formulated as water-soluble granules, pellets, or briquets for ease of application, and can be purchased from lawn and garden shops and farm supply stores.

3. Check around faucets and air conditioners and repair leaks that result in puddles for several days. Eliminate seepage from cisterns, cesspools, and septic tanks, and standing water around animal watering troughs

4. Fill or drain ditches and swampy areas. Remove, drain or fill tree holes and stumps with sealant so as not to accumulate water.

5. Irrigate lawns and gardens carefully to prevent water from standing for several days.

Controlling Adults - It may be necessary to supplement breeding site reduction with control efforts directed against adults. Adult mosquitoes prefer to rest in trees, shrubs, and dense vegetation during the day. Consequently, yards with a lot of shade often have nightmarish problems with mosquitoes. Some species also can fly long distances and may be breeding on adjoining property.

Exclusion - Mosquitoes can be kept out of homes by securely screening windows, doors and porches. The occasional mosquito found indoors can be eliminated with a fly swatter or aerosol-type insecticide labeled for mosquitoes, gnats, and other flying insects.

*Vegetation Management* - As mentioned earlier, adult mosquitoes prefer to rest in dense vegetation during the day. Consequently, homeowners should remove tall weeds and rank vegetation from their yard. To further reduce intolerable levels of biting adult mosquitoes, insecticides can be applied to the lower limbs of shade trees, shrubs, and shaded areas adjoining foundations and occupied areas. Lawn and garden formulations containing carbaryl, malathion or synthetic pyrethroids (e.g., permethrin, Ortho Bug Stop; cyfluthrin, Bayer Advanced Lawn & Garden Multi-Insect Killer) are effective but of fairly short duration. A hose-end sprayer is usually most effective and convenient for such applications.

*Topically-Applied Repellents* - Repellents will help prevent bites when spending time outdoors. The most effective mosquito repellents contain the active ingredient diethyl toluamide (DEET). In general, the higher the percentage of DEET in the ingredients, the longer the protection. Low - percentage formulations are available for use with young children. Non-DEET containing repellents (e.g. Avon Skin-So-Soft®, citronella) may provide some relief, but generally to a lesser degree and for shorter duration than DEET-containing products. It is often desirable to apply insect repellent on outer clothing as well as the skin. Always read and follow directions on the container. Mosquito repellent should not be applied to the hands of young children, and treated skin should be washed with soap and water after returning indoors.

*Bug Zappers, Citronella Candles, Ultrasonics, etc.* - Many consumer products claim to attract, repel or kill mosquitoes. Most of these devices do not work, or are only marginally effective. “Bug zappers” using ultraviolet light as an attractant are generally ineffective in reducing outdoor populations of mosquitoes and their biting activity. Studies indicate that less than five percent of the mosquitoes killed by bug zappers are females – the only ones that actually bite. The rest are non-biting, male mosquitoes and other harmless night flying insects. Somewhat better results have been obtained with citronella candles. For maximum protection, use multiple candles positioned close (within a few feet) of where people are sitting. *A single candle stationed at the outer edge of a large picnic blanket probably won’t provide much benefit, other than “atmosphere.”*

Ultrasonic devices, mosquito-repellent plants, garlic, and other gimmicks routinely touted in magazine advertisements are generally ineffective. When it comes to mosquito control, if it sounds too good to be true, it probably is.

## **DIAGNOSTIC LAB HIGHLIGHTS**

**by Julie Beale and Paul Bachi**

Recent samples seen in the Diagnostic Lab have included zinc, magnesium, and temporary phosphorus deficiency, as well as herbicide injury on corn; Rhizoctonia root and stem rot on soybean; and stripe smut on fescue. On tobacco, blackleg/bacterial soft rot is developing rapidly on transplants that have been held in float beds--and clipped--during recent rainy weather in many counties in central Kentucky. Also on tobacco, we have seen Pythium root rot, target spot, and chemical injury from herbicides, growth regulators and fungicides.

On fruit and vegetable crops, we have seen anthracnose on strawberry; fireblight on apple and pear; bacterial canker and Cytospora canker on peach and apricot, typically moving in on freeze-damaged tissues; Rhizoctonia stem rot on bean; Pythium root rot on pepper and cantaloupe; and tomato spotted wilt virus on tomato.

On ornamentals, we have diagnosed Rhizoctonia stem rot on snapdragon; take-all on bentgrass; rose rosette disease on rose; Botryosphaeria dieback on rhododendron; black root rot on holly; Cytospora canker on spruce; and Verticillium wilt and Phyllosticta leaf spot on maple.

## **INSECT TRAP COUNTS**

### **Princeton, May 18-25, 2001**

Black Cutworm . . . . .	8
True Armyworm . . . . .	68
Fall Armyworm . . . . .	0
Beet Armyworm . . . . .	0
Corn Earworm . . . . .	4
European Corn Borer . . . . .	0
Southwestern Corn Borer . . . . .	4

NOTE: Trade names are used to simplify the information presented in this newsletter. No endorsement by the Cooperative Extension

Service is intended, nor is criticism implied of similar products that are not named.