## ANNOUNCEMENTS

### UPCOMING PESTICIDE TRAINING MEETINGS

- **March 6 - Vegetable Pest Management Training**
  A vegetable pest management training will be held at the University of Kentucky College of Agriculture’s Robinson Station in Jackson. Registration begins at 9 a.m. eastern time. The program will start at 9:30 and concludes at 4 p.m.

   Topics will include an overview of common insect pests and pest monitoring using pheromone traps; managing vegetable insecticides – control, resistance and cost; herbicide selections and calculations; recognizing and understanding infectious diseases in vegetables; and the principles of fungicide use in a vegetable integrated pest management program including the proper use and limitations of available products.

   The program is open to anyone and free of charge. Lunch will be on your own. The program has been approved for 3 general and 2 specific hours for Pesticide Applicator Training certification for categories 1, agriculture applicator; 10, demonstration and research; and 12, retail pesticide sales agent (dealer) for Kentucky Pesticide Applicator Training.

   For more information contact Patty Lucas at plucas@uky.edu or 270-365-7541 ext. 218 or Terry Jones at (606) 666-2438 or tjones@uky.edu.

- **March 19- IPM TRAINING SCHOOL**
  Weed, insect and disease problems of corn, soybeans, small grains and alfalfa will be covered during the integrated pest management training school at the University of Kentucky Research and Education Center in Princeton. Registration will begin at 8:30 a.m. The program begins at 9 a.m. and ends at 4 p.m. It is open to the public and free of charge. Advance registration is not needed. An update of pest problems in Kentucky will include soybean stem borer, soybean rust and pesticide resistant pests. The program has been approved for 5.5 continuing education credits for certified crop advisors in the areas of pest management, 3 hours; crop management, 2 hours; and soil and water management, 0.5 hours. The program has also been approved for 3 general and 2 specific hours for Pesticide Applicator Training certification for categories 1, agriculture applicator; 10, demonstration and research; and 12, retail pesticide sales agent (dealer) for Kentucky Pesticide Applicator Training. For additional information contact Patty Lucas at (270) 365-7541 ext. 218 or plucas@uky.edu.

## FRUIT CROPS

- Manage anthracnose of blackberries and raspberries in spring

## VEGETABLES

- New insecticides for vegetables
- New tool for organically certified producers
- Pasture fly control options: Eear tags
RANDOM CHECKS OF PRIVATE APPLICATOR
PESTICIDE RECORDS AND WPS COMPLIANCE

Inspectors from the Ag Branch of the Kentucky Division of Pesticide Regulation will check the pesticide records and Worker Protection Standards compliance of approximately 200 randomly-selected private applicators this winter. Farmers will receive and advance written notice. During the visit, the inspector will provide the farmer with information on recordkeeping requirements, review pesticide application records, and provide compliance assistance, if needed. This is a national program to see how well private applicators are complying with the law. Individual farmers names or certification numbers will not appear on the inspection sheets. **Identity and results of individual inspections will remain confidential.**

Keeping pesticide records is good business practice and has numerous benefits! Here are a few examples: **Saves money** - Accurate pesticide records will enable you to know and buy the correct amount of pesticides for each growing season. **Shows what is working** - Good records will help you determine how a pesticide application achieved the best results or why a pesticide may have performed poorly and prevent future repeated failures. **Documents correct use** - Should a question arise concerning pesticide use, your records may provide liability protection. **Improves management decisions** - Since some pesticides have restrictions on what can be planted the following year in the same field, good records can help you plan your crop rotations.

TOBACCO

PYTHIUM DISEASES IN THE TOBACCO FLOAT SYSTEM - UNDERSTANDING THE PROBLEM
by William Nesmith

The float system is the primary means by which tobacco transplants are produced in Kentucky, accounting for >95% of the plants set in 2002. When growers first started using the float system they experienced few problems with Pythium because their systems were relatively free of the pathogen. However, with time, most greenhouses and outdoor bays have become contaminated with agricultural soils where this soil-inhabiting organism is common. Initially, the growers controlled the disease mainly by using Ridomil, even though the label specifically prohibited its use for this site, but in time that reached within days. In general, we find significant Pythium present in most well-reused float systems, even when plants are showing few symptoms of the disease, but the disease severity increases with increasing temperature and higher water pH. Significant damage sometimes occurs even at cool temperatures when plants are small, however.

Our research has confirmed that tobacco roots from the float system are often colonized by Pythium spp. In fact, a wide range of Pythium species colonize tobacco roots, stems, and leaves in this system resulting in considerable variation in the symptoms produced, from barely detectable to death. Since 1990, we have found and confirmed pathogenicity of the following species of Pythium associated with tobacco seedlings and transplants: *Pythium aphanidermatum* (causing root rot and black shank-like dark stem rot when water temperatures are above 85°F), *Pythium debaryanum* (causing seed rot and damping-off mainly in outdoor float systems), *Pythium myriotylum* and *Pythium volutum* (the most common species found when water temperatures are in the 70's°F causing extensive plant yellowing, stunting and aggressive root and stem rot), *Pythium dissotocum* (causing mild stunting due to rot of feeder roots, but little yellowing), *Pythium irregularare* (causing a root and stem rot of small seedlings), and *Pythium spinosum* (causing slimy roots and root rot, especially in older transplants). Several other species have also been detected frequently, but we have been unable to prove their pathogenicity. Pythium can be severe at any stage from seeding until near transplanting, either through direct losses, delayed plant development, low vigor after transplanting, or
predisposition to other diseases, such as black shank and Fusarium wilt.
The life cycle of Pythium is as follows: It is a common soil-inhabiting organism where it lives as a saprophyte on organic matter, or as a parasite causing disease, or in a resting stage. It is well adapted to watery habitats, where it produces asexual fruiting bodies called sporangia. The sporangia empty their contents into an attached vesicle where zoospores are formed and liberated. The zoospores are motile and are able to swim in the water, locate the roots, infect, and colonize them. Zoospores are the main means of dissemination of this pathogen within the float system. In fact, we often do not see serious development of disease until the roots start emerging into the water, probably because the zoospores are trapped in the soil media until infected roots reach the water. Pythium also produces resting structures (chlamydospores and oospores) that allow survival for long periods. In addition to being in the colonized plant tissues, we find these resting structures present in the old trays, both on and within pieces of infected roots trapped in the crevices of the styrofoam.

Yellowing and stunting from root rot has been more common than damping-off and stem rot. Late season Pythium activity is now commonly recognized by growers and is associated mainly with a root rot which results in extensive yellowing and stunting of plants, rather than the lethal damping-off and stem rot observed earlier in the season. Affected plants appear in clusters (involving multiple trays to the whole bay), stunted and yellowed compared with the greener and taller healthy neighbors. The roots of affected plants are water-soaked and light brown in color and become slimy to mushy, with the rot extending upwards, often including the base of the stem. When Pythium aphanidermatum is present the roots can be very dark, but when the dark color is confined only to the water roots, factors other than Pythium are involved.

Sometimes Pythium develops suddenly and increases rapidly late in the season. This is usually because Pythium activity is temperature sensitive, in that the disease is much worse when water temperatures are above 68-70°F, especially when they are above 75°F. So, delay filling bays until they are ready to be floated. Allowing portions of the bays to remain open and exposed to direct sunlight aids warming and encourages Pythium development, be it during initial bed establishment or during transplanting periods. Once soil and air temperatures become sufficiently high to raise water temperatures into the 70's and 80's°F, Pythium potential increases rapidly.

Sanitation is critical to controlling Pythium. Carefully consider this potential before reusing anything in the system. See Kentucky Pest News, issue Number 974, January 27, 2003 for more details on tray sanitation. Do not use water from ponds or streams in float systems as such water usually contain Pythium.

Only one chemical is labeled for Pythium control in the float system, Terramaster. I strongly urge it be used as a preventive treatment, rather than waiting until the disease develops. The rates for the preventive treatments are lower and much less likely to cause phyto problems, if used correctly, than the higher rates used in rescue. However, be sure to premix it into water outside the bay then add it to the float bays while thoroughly mixing it with the float water. Even at the lower rates, some injury is still likely with Terramaster, but the level of damage is acceptable, especially when compared to the damage caused by not controlling Pythium. There may be an exception in high pH water areas. In our tests, we have found very little injury when Terramaster is used properly with low pH water (below 6.3, which is common in Kentucky) but we have found increased potential for root damage from Terramaster with waters having naturally high pH, above 7.0, which are common in some communities. The reasons for this are not understood at this time.

**PREPARING FOR FLOAT PLANT PESTS**
by Lee Townsend

Sowbugs (or pillbugs) and slugs have been serious problems in some float systems. Pillbugs can get into trays and burrow into the media, uprooting small seedlings and may even feed on root hairs. Slugs feed on plant leaves and can destroy a large number of seedlings in a short period of time. The moisture and protection around float beds is exactly what these creatures need to thrive. Both will be active soon so it is not too early to take steps to reduce their numbers. Sanitation or elimination of shelter and allowing as much drying as possible are important steps. Pick up and remove as many things that are lying on the ground outside float beds or greenhouses as possible. Concentrate on any items that provide shelter and keep soil moisture high. Boards, sacks, and pieces of plastic are prime problem sites.

Later, clip and remove grasses and weeds alongside floats or houses. A 12" inch band of bare ground, sand, or gravel may help to prevent pests from wandering close and entering the trays. Allow sunlight and air to help to keep the border areas dry. Keep the area clear until transplant production is complete. Application of slug baits along those areas now can help to reduce problems later. Sevin bait can help to reduce pillbugs.
MONSANTO RECEIVES COMMERCIAL APPROVAL FOR YIELDGARD ROOTWORM BT CORN
by Ric Bessin

This week Monsanto received full approval for YieldGard Rootworm Bt corn. This is a new type of Bt corn that produces a protein that protects that plant from losses caused by corn rootworm larvae. While YieldGard Bt corn only is only protected from attack by some caterpillars, most notably European corn borer and southwestern corn borer in Kentucky, YieldGard Rootworm protects only against corn rootworm attack. YieldGard Rootworm corn has been approved for all end uses in the US and has completed regulatory review in Japan as well.

As with YieldGard corn, YieldGard Rootworm Bt corn has a required stewardship program to prevent the development of rootworm resistant populations. The EPA requires growers using YieldGard Rootworm corn to plant a minimum of a 20 percent refuge of non-YieldGard Rootworm corn immediately adjacent to or within the YieldGard Rootworm field.

FRUIT CROPS

MANAGE ANTHRACNOSE OF BLACKBERRIES AND RASPBERRIES IN SPRING
by John Hartman

Blackberries, raspberries and black raspberries grown in Kentucky are susceptible to anthracnose, a serious fungal disease. Crop yields are reduced due to cane infections girdling the stems leading to wilting and dieback or due to partial girdling of stems resulting in loss of vigor and reduction in fruit size and quality. Black raspberries are especially susceptible to anthracnose. Other diseases such as cane blight, spur blight, and Septoria cane and leaf spot may cause some similar symptoms.

Symptoms. Anthracnose symptoms are most striking on canes but can also occur on leaves, petioles, flower buds, and fruit. In the spring, reddish purple spots appear on young canes. As the disease progresses, the spots enlarge into an oval shape and the tan to gray centers become sunken with purplish raised margins. Diseased tissue extends down into the bark and partly girdles the stem. By late summer or early fall, the diseased tissue often cracks. Within these lesions spores are produced which are spread by running water, splashing rain, and wind. Canes weakened by anthracnose are more susceptible to winter injury and eventually may die.

On leaves, anthracnose appears as small, irregular, yellowish-white spots. As spots enlarge, they may have a tan center with reddish margins. Spots sometimes drop out, giving a shothole symptom. Fruit infections are not common unless there is a high level of anthracnose in the plantings. Infected fruit is typically dry and seedy.

Disease cause and life cycle. Anthracnose is caused by the fungus *Elsinoe veneta* which overwinters on the bark or within lesions on floricanes infected the previous season. In early spring, just as the canes are leafing out, fungal spores are produced on these diseased canes. These spores are blown, rain-splashed, or vectored by insects to young, rapidly growing, succulent green primacane tissue where infection occurs. Symptoms appear as small tan lesions in about a week. The primary damage to plants is caused by these early infections.

Disease Management. Control can be achieved by sanitation and spraying. Although sanitation is labor-intensive, it is an effective management practice for the control of anthracnose. The fungus can survive on dead canes that have been pruned off. If pruned canes are left in or near the planting, the disease can spread back into the planting. Removing the pruned canes reduces the potential for disease development. Early spring application of lime-sulfur fungicide is a useful preventive measure. See U.K. Cooperative Extension publication "Midwest Commercial Small Fruit and Grape Spray Guide 2003 (ID-94) for rates and timing. It is important to plant clean, disease-free nursery stock. Cut out all diseased canes, cane "handles," and any infections observed on new plants. Provide good air movement through the planting by removing weeds and spindly canes. If possible, all wild brambles within the vicinity should be rogued, for these wild plants will also harbor the pathogen.

VEGETABLES

NEW INSECTICIDES FOR VEGETABLES
by Ric Bessin

As the vegetable growing season begins to move into action, there are a few insecticide additions to the 2002-2003 Vegetable Production Guide for Commercial Growers, ID-36, that county agents and growers need to be aware of. In the past five years we have experienced a rapid change in the types of insecticides we are using with commercial vegetable production. Of the newer products, many are much more selective in the types of pests they kill. Some of the older and cheaper organophosphate insecticides have lost many labeled uses. As we move toward more selective insecticides, field monitoring and accurate pest identification will play an increasingly more important
role. Listed below are five new additions to ID-36 (minimum Pre-Harvest Interval in days for the specific crops are listed in parentheses).

**Assail 70 WP**, is a Cerexagri product with acetamiprid as the active ingredient. This has a 12 hour Re-Entry Interval (REI), the signal word of “CAUTION,” and is a general use insecticide. This neonicotinyl insecticide is used as a foliar spray on leafy vegetables (7), fruiting vegetables (7), and cole crops (7). It is labeled for use against aphids, whiteflies, and Colorado potato beetle.

**Baythroid 2**, is a Bayer product with cyfluthrin as the active ingredient. This has a 12 hour REI, the signal word of “DANGER,” and is a restricted use insecticide. This pyrethroid insecticide is used as a foliar spray on cole crops (0), lettuce (0), southern peas (3), dry peas (7), peppers (7), potato (0), sweet corn (0), and tomatoes (7). It is a broad-spectrum insecticide labeled for use against a wide variety of pests.

**Courier 70 WP**, is a Nichino America product with buprofezin as the active ingredient. This has a 12 hour REI, the signal word of “CAUTION,” and is a general use insecticide. This very selective insect growth regulator is used as a foliar spray only against nymphs of various whiteflies on lettuce (7), cucumbers (7), melons (7), pumpkins (7), squash (7), and tomatoes (7). This should not harm beneficial insects.

**Intrepid 2 F**, is a Dow AgroScinces product with methoxyfenozide as the active ingredient and belongs to the dicylhydrazine class of insecticides. This has a 4 hour REI, the signal word of “CAUTION,” and is a general use insecticide. This very selective insect growth regulator mimics the action of molting hormone in Lepidopterous (moths and butterflies) larvae. It has virtually no effect on other groups of insects. It is used as a foliar spray on cole crops (1), leafy vegetables (1), fruiting vegetables (1), and sweet corn (3-ears, 21-fodder). This should not harm beneficial insects.

**Capture 2 EC**, this is a currently registered insecticide produced by FMC. Although there are no crop or pest changes to the label, the Restricted Entry Intervals have changed for this product. They have been reduced to 12 hours for all crops regardless of whether they are machine or hand harvested. The previous REI’s had been as long as 19 days which had limited its use in Kentucky.

**NEW TOOL FOR ORGANICALLY CERTIFIED PRODUCERS**

by Ric Bessin

Dow AgroSciences has just received approval for a new insecticide that is now available for organic producers. The product is called Entrust and contains the active ingredient spinosad. Spinosad is a microbial insecticide that is produced through fermentation by the soil organism *Saccharopolyspora spinosa*. It has been classified as an organic substance by the USDA National Organic Standards Board. It is formulated as an 80% wettable powder for use against foliage feeding Lepidopterous (moth and butterfly) larvae, Colorado potato beetle, thrips, and leafminers. It has a long list of approved crops on the label that includes asparagus, bushberries, cereal grains, cole crops, corn, sweet corn, popcorn, teosinte, cotton, cucurbits, fruiting vegetables, leafy vegetables, leaves of root and tuber and legume vegetables, pome fruit, potatoes, tuberous and corn vegetables, soybeans, stone fruit, strawberries, succulent and dry beans and peas, and tree nuts

**LIVESTOCK**

**PASTURE FLY CONTROL OPTIONS: EAR TAGS**

by Lee Townsend

Price breaks on early order opportunities often means considering fly control programs well before the season begins. Here are the basic options for insecticide impregnated ear tags.

Insecticide-impregnated cattle ear tags release small amounts of an insecticide which are distributed over the animal during grooming or rubbing. In general, ear tags have provided excellent, long term control of horn flies and a reduction in face fly numbers.

Factors to consider when using these products:

Read the label before you purchase and use insecticide ear tags. All tags are labeled for beef cattle while only those with certain active ingredients are approved for use on lactating dairy animals. Also, check for any limitations for use, such as animal age.
Look for the common name of the active ingredient (for example, permethrin). In some cases, different brands of tags contain the same active ingredient. You can save money by comparison shopping, or avoid inadvertently using the same active ingredient if resistance is a potential problem.

Consider the recommended number of tags per head. Some brands are used at the rate of one per animal. UK research trials have generally shown that systems which use two tags per animal seem to provide better face fly control than those which rely on a single tag. Animals only need to be handled one time to apply the tags. However, this is not necessarily when you would normally work your animals.

For fly control, it is best to tag animals after horn fly numbers reach 50 or more per side. This reduces the chances of developing resistance to the active ingredients that are being used. Normally, tags provide 12 to 15 weeks of fly control. Tagging too early in the season can mean that the tags are not providing good control in the fall that will help to control the overwintering population. With insecticidal ear tags, the control system moves with the animals. This may be an advantage if animals are moved at intervals and dust bags or back rubbers are not in place in every pasture or grazing area. There are three main types based on the active ingredient(s) that they contain.

1. Organophosphate (OP) insecticides such as diazinon, fenthion, pirimofos methyl, or a diazinon + chlorpyrifos combination. These tags provide good horn fly control and moderate face fly control.

2. Synthetic pyrethroid (SP) insecticides- fenvalerate and permethrin are the original members of this group. These tags are sold under a variety of brand names. Usually they are less expensive than the new, more expensive synthetic pyrethroids, such as cyfluthrin, lambda-cyhalothrin, and zeta-cypermethrin. These tags provide good horn fly control and better face fly control than the OP tags.

3. A relatively new group of combination tags has appeared. These couple an OP and a SP in the same tag. Current examples pair lambda-cyhalothrin and pirimiphos methyl or cypermethrin and chlorpyrifos. The assumption is that the OP would control SP-resistant horn flies.

Are there any safety precautions associated with using insecticide ear tags?

Non-permeable gloves should be worn when tagging animals. This is clearly shown in the application pictures on the containers of some tag brands. The hands shown applying the tags clearly have gloves. Comparable pictures with other brands do not obviously show gloves, although label statements indicate that they should be worn.

Insecticidal ear tags should not be handled bare-handed. The concentration of insecticide in the tags varies from 8% to 36%. The tags are manufactured so that the insecticide is rubbed off the surface and onto the animal. Any handling of the tags leaves some insecticide on the hands. The insecticide then can be transferred easily to the mouth, eyes, face or other areas of the body. Some individuals may be very sensitive to the active ingredients in the tags.

Signal words on the label range from CAUTION to WARNING. Several products carry statements about the potential for allergic reaction following exposure. Many are easily absorbed through the skin or eyes, some have irritation vapors. Wear protective gloves and wash hands thoroughly with soap and water after tagging or when taking a break.

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.