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### ANNOUNCEMENTS

#### 2002 IPM TRAINING SCHOOL

Mark your calendar now for the 2002 IPM Training School! Scheduled for March 20, the meeting will be held at the UK Research Center in Princeton. Registration will open at 8:30 AM with the meeting starting at 9:00 AM and ending at 3:30 PM.

Pest identification will be a major part of the training school. Weed, insect and disease problems of corn, soybeans, small grains and alfalfa will be covered. An update of pest problems in Kentucky will include the following topics: Biology of Key Corn Diseases, Insect Damage in High Oil Corn and The Soybean Aphid in Kentucky. Also, the new computer program being used by the University of Kentucky Soil Testing Laboratory will be demonstrated.

Advance registration is not needed and the meeting is open to the public free of charge. The program has been accredited for 5.5 CEU's for Certified Crop Advisors. For additional information contact Patty Lucas at 270-365-7541 ext 218 or plucas@uky.edu.

### SOYBEANS

#### SOYBEAN DISEASES CONTROL: ARE WE MISSING OPPORTUNITIES?

**PART ONE: SCN**

by Don Hershman

Recently, there has been a thread of interest in the Green River Area related to possible disease control opportunities that might be being missed by farmers. The root of this interest is a general belief that soybean yields are not improving at the same relative pace as corn yields. Some producers, in fact, believe that their soybean yields have stabilized, or have even taken a turn for the worse in recent years. I cannot address the reality, or lack thereof, that soybean yields are not what they could be. However, over the next three issues of Kentucky Pest News, I will address producer concerns related to possible improvements in disease management strategies in soybean. I will also address areas where soybean disease management limitations are on-going.

**Soybean Cyst Nematode:**

Soybean cyst nematode (SCN) exists virtually everywhere soybean is grown in Kentucky. The pest is insidious in that significant yield damage often occurs without the appearance of visible disease symptoms. This is an extremely important point,
because it suggests that farmers are frequently unaware that SCN is active and doing damage in a field. When lower-than-expected yields are encountered by farmers, they often attribute the situation to causes other than SCN.

A development in recent years has been the almost exclusive use of SCN-resistant varieties anytime SCN is known to exist in a field. This is a logical line of thinking since the use of resistant crop varieties in disease management programs is usually at the top of the recommendation list. In fact, the use of SCN-resistant soybean varieties is an essential component of any successful SCN management program. However, there is a catch in regards to the use of SCN resistance. Planting SCN-resistant varieties too often, even every other year as many soybean producers do, can result in populations of SCN that no longer respond to most available resistant varieties. The vernacular for this is called a “race shift”, and it is due to a biological process called selection pressure. The net effect is that overuse, or the improper use, of resistance genes can ultimately lead to the inability to manage SCN using most resistant varieties.

In a study we conducted on a “race 3” field population of SCN in Christian County from 1994-99, SCN populations began to significantly increase on the “resistant” varieties tested the third time a specific variety was grown. That is, there was a dramatic increase in SCN in year three for continuous soybean, and in year six when soybean was grown every other year in rotation with corn. Since so many farms with SCN are being planted to the same (or similar) SCN-resistant soybean every other year, this situation could be the cause of yield stagnation or declines in a field over a few crop cycles. It is a possibility worthy of consideration.

A much less risky use of SCN-resistant soybean is to alternate different resistant varieties, each based on a different source of SCN resistance. Our work has shown that this practice will delay “race shifts” and problems with resistance effectiveness; however, the risk of population shifts, over time, still exists. For example, in the same study referred to above, we looked at continuous soybean, but alternating sources of resistance. We detected a developing problem with managing SCN in year six of the study. Obviously, inserting corn or some other non-host crop into the equation, and planting different resistant soybean every other year, might eliminate this concern from a practical perspective.

Another aspect of SCN resistance that is not widely understood, is that not all SCN-resistant varieties are equally effective in managing SCN. For example, individual SCN field populations will each respond differently when exposed to a range of SCN-resistant varieties. This is true even for varieties marketed as having the same SCN resistance (e.g., race 3, 14). Depending upon the variety, SCN populations will either go down, up, or stay about the same as the season progresses. Yield results will also be highly variable. Variability is mainly an artifact of breeder technique, biological and experimental variation, the source(s) of resistance used, and the extent of greenhouse/field evaluation during variety development. Genetic variation in SCN populations from farm to farm only makes matters worse. The net effect is that two varieties, each reported to be resistant to the same “race” of SCN, may impact SCN and yield quite differently. In other words, there could be a great deal happening on the farm that relates simply to which variety is being grown.

With the above performance variables, what is a producer to do? One approach is to generate farm-specific data on how different resistant varieties perform. To do this, one could plant and measure yield in a “strip trial” of resistant varieties in a field infested with SCN. For anyone who does this, I recommend taking soil samples for SCN analysis at planting and at the end of the season, for each strip planted. This will give you some indication of how each variety impacted SCN populations and how yield related to those populations. This situation is not ideal because the strips would not be replicated, and, thus, would be subject to experimental variability. However, basing decisions on a strip trial data is superior to making “blind” variety selection decisions. The second-best approach would be to plant multiple soybean varieties on the farm and, again, keep track of yield and SCN populations over time. At a minimum, ask your seed dealer for an assurance that the variety they propose to sell you has been thoroughly tested under a range of conditions. Ask them questions. Ask for data; this includes university data from other states as well as company data.

You may have heard of a new soybean breeders line, CystX, which is resistant to all known races of SCN. The basis of CystX resistance is PI437654. This resistance was first incorporated into the variety ‘Hartwig’ almost a decade ago and later in ‘Anand’. The big advantage with CystX is that many negative agronomic characteristics associated with PI437654 were eliminated. This makes CystX easy to use in developing new SCN-resistant varieties in a range of maturity groups. These are all positive developments. Any variety based on PI437654 resistance is, in fact, highly effective in managing SCN, at least in the short term. However, PI437654 resistance is not a “silver
“bullet” for managing SCN. There is already evidence that over time many SCN field populations will adapt to, and be able to reproduce on, soybean with PI437654 resistance genes. The history of SCN proves that it is a highly adaptable pest. Once SCN field populations are able to reproduce on PI437654-based resistance, the consequences could be disastrous. The end result would be to limit the use of ALL current SCN-resistant soybean varieties in SCN management programs. This is because all the resistance genes found in other resistant soybeans are also found in PI437654. Thus, resistance failure in PI437654 would be a giant step backwards until new sources of resistance are discovered and developed. The bottom line is this: judicially use any SCN-resistant soybean which is based on PI437654 resistance.

One final note on SCN. Perhaps my greatest concern is that very few producers are periodically testing their fields for SCN populations changes over time. Most producers are just assuming that what they are doing is working and they have moved on to other concerns. The problem here lies in making the assumption that SCN populations are being manipulated as desired. The simple fact is that in many cases, SCN populations are NOT being effectively managed. My main exhortation here is for producers to sample all SCN-infested fields at least once every four years for SCN analysis. More frequent sampling may be necessary when specific management questions exist. Instructions for sampling fields and submitting samples for SCN analysis can be obtained at your local county Extension office. The cost is $8.50 per sample.

Next issue I will discuss soybean sudden death syndrome.

VEGETABLES

MUSTANG RECEIVES EXPANDED LABEL FROM EPA
by Ric Bessin

The synthetic pyrethroid insecticide Mustang 1.5 has recently received an expanded label for certain vegetable and field crops uses. This Restricted Use Pesticide, containing the active ingredient zetacypermethrin, is produced by FMC corporation. The label bears the signal word of WARNING and has a 12 hour REI on all applications. It has broad spectrum control of a wide range of insect pests on alfalfa, corn (field, seed, and popcorn), sorghum, soybeans, and wheat. It is also labeled on several of the new vegetable crop groupings including head and stem brassica (including broccoli, cauliflower, cabbage, collards, kale, mustard), bulb vegetables (including garlic, onions, leeks, shallots, and scallions), sweet corn, fruiting vegetables (including eggplant, pepper, tomato), leafy vegetables (including lettuce, rhubarb, spinach), legume vegetables (including succulent and dried beans and peas), rice, and pecans.

The preharvest intervals are 1 day for head and stem brassicas, fruiting vegetables, leafy vegetables, and succulent legumes, 3 days for cutting alfalfa and harvesting sweet corn, 7 days for bulb vegetables, 14 days for wheat, rice, and sorghum, 21 days for dried beans and peas, pecans, and soybeans, 30 days for field corn and popcorn.

LAWN & TURF

EARTHWORM CASTINGS RARELY WARRANT CONCERN
By Lee Townsend

Earthworms literally eat their way through the soil. They create channels for aeration and water penetration, in addition to bringing up deep soil to mix with that near the surface. Species that burrow deeply usually leave “casts”, piles of fecal matter, on the surface at or near the entrance to their burrows. Casts are small, lumpy pellets or paste-like slurries that can form irregular mud-like shapes, heaps, or columns. Casts can cover significant portions of lawns or turf areas, creating a lumpy or crunchy feeling and giving a muddy appearance. They can be raked down or picked up during mowing. Lumpy lawns can be smoothed with a heavy lawn roller. No insecticides are registered for earthworm control.

LAWN MITES
By Lee Townsend

Clover mites and winter grain mites are active in some lawns. Clover mites are very small, reddish-brown creatures that appear only as moving dark spots to the naked eye. Winter grain mites have dark black bodies with long red legs.

Sheer numbers of either, plus the resulting red-brown stain left behind if they are crushed, make them
unwelcome visitors. The red stains are not blood, they are the mite's body pigments. They are not blood feeders and will not harm people or pets, nor will they infest household products. Once inside a home or building they will soon die.

Both species feed on turf grasses or weeds. They can be especially abundant in the heavy, succulent growth of well-fertilized lawns. They usually enter a home around windows or doors so they are usually seen crawling along sills or thresholds. The mites can crawl up outside walls and may enter the buildings at upper levels.

Lawn mites are a temporary nuisance; they appear suddenly and then are gone. A soapy rag or wet sponge can be used to clean mites off of surfaces. Wipe carefully to avoid crushing the mites and causing stains. The crevice tool of a vacuum cleaner may also be used to pick up mites. Rely on non-chemical control indoors. Do not apply insecticides to kitchen counters or other interior surfaces.

There is an increased potential for invading structures when grass extends up to the foundation. A plant bed or open area will provide a barrier that will stop many mites and provide a long term solution to persistent problems. Avoid overfertilizing lawns. This creates situations that are ideal for mites to increase to tremendous numbers.

Mites seen on the outside of buildings can be killed with a direct spray of an insecticidal soap. This treatment will not provide any residual control. A spray of Diazinon, Dursban, or Tempo along the outside walls and extending about 10 feet out from the foundation may provide some relief.

SHADE TREES & ORNAMENTALS

SUDDEN OAK DEATH QUARANTINE ANNOUNCED
by John Hartman

During the past year, a new disease of oaks and other woody plants has appeared in the coastal regions of northern California and Oregon. The disease, sudden oak death (SOD), is caused by a fungus new to the U.S., called Phytophthora ramorum. The fungus causes a bleeding necrosis on the trunks and limbs of affected trees and shrubs and can girdle and kill infected plant parts. In Kentucky, our concern has been whether or not this disease would be similarly devastating if the pathogen were introduced into the state. The SOD disease fungus thrives in the relatively cool and moist climate of coastal California and Oregon. Since we also can have periods of cool, moist weather in spring and sometimes in fall, one might expect the disease to sometimes thrive here, too. Thus, there is a need for a quarantine to prevent movement of infected plants or the pathogen from the West Coast to Kentucky.

Effective February 14, 2002 the USDA Animal Plant Health Inspection Service (APHIS) published an interim rule and notice of public hearings on quarantine and regulations for Phytophthora ramorum, cause of Sudden Oak Death. The full text of this interim rule appears in the Federal Register, Volume 67, N umber 31, p. 6827-6837. The regulations quarantine ten counties in California and a portion of one county in Oregon because of the presence of P. ramorum and restrict the interstate movement of regulated and restricted articles from quarantined areas.

Regulated articles may be moved interstate from quarantined areas under certificates issued by APHIS PPQ inspectors. Regulated articles include the following:

- Soil and nursery stock (except acorns and seeds),
- Unprocessed wood and wood products including firewood, logs, and lumber, wreaths, garlands, and greenery of the following species: Arrowwood (Viburnum x bodnantense); Big leaf maple (Acer macrophyllum); Black oak (Quercus kelloggii);
- California bay laurel (Umbellularia californica);
- California buckeye (Aesculus californica);
- California coffeeberry (Rhamnus californica);
- California honeysuckle (Lonicera hispidula);
- Coast live oak (Quercus agrifolia);
- Huckleberry (Vaccinium ovatum) (Fruits of huckleberry are not regulated items);
- Madrone (Arbutus menziesii);
- Manzanita (Arctostaphylos manzanita);
- Shreve's oak (Quercus parvula var. shrevei);
- Tanoak (Lithocarpus densiflorus); and Toyon (Heteromeles arbutifolia).

Certificates will be issued for the movement of regulated articles if an inspector determines that certain conditions have been met. These conditions include:

- Soil has undergone heat treatment
- Greenery has undergone hot-water dipping
- Firewood, logs, or lumber have been debarked
- Soil (duff removed) has not been in direct physical contact with any article infected with P. ramorum
- Inspected nursery stock has been found free of P.
Some plant materials such as bark chips, forest stock, and mulch of the plant species listed above are considered restricted articles. Restricted articles may only be moved interstate from quarantined areas in accordance with a USDA permit issued for experimental or scientific purposes.

APHIS invites comments supporting or contradicting the proposed regulatory strategy, including: comments on the inspection and sampling requirements for nurseries, evidence demonstrating whether contaminated soil or debarked wood of host plants provide viable or likely pathways for spread or infection of natural hosts by P. ramorum, evidence demonstrating whether acorns, seeds, or fruits of host plants are naturally infected by or carry P. ramorum, data related to tests that can be used to detect P. ramorum, and evidence demonstrating whether certain treatments are effective in eliminating P. ramorum infection in regulated articles.

APHIS will consider all comments they receive that are postmarked, delivered, or e-mailed by April 15, 2002. They will also consider comments made at public hearings to be held in Petaluma, CA, on February 27, 2002; and in Riverdale, MD, on March 27, 2002.

HOUSEHOLD

OVERWINTERING BUGS APPEARING IN BUILDINGS
By Mike Potter

Many bugs are beginning to appear “mysteriously” inside homes and businesses. Most have either been ladybugs, cluster flies/face flies, yellowjacket or paper wasp (queens), stink bugs, or leaf-footed (seed) bugs.

Where Did They Come From?
These critters actually gained entry last fall through cracks and openings, and spent the winter hibernating in attics, soffits, wall voids, window/door casings, and similar protected areas. With the onset of warmer weather, the insects have again become active and are emerging from their overwintering sites. As they attempt to escape to their natural habitat outdoors, some inadvertently disperse inward into living areas, emerging from beneath baseboards, behind window and door frames, from within sash-cord openings, and around light fixtures and ventilators. Since many insects are attracted to light, they are often seen around windows and lighting fixtures.

What Can Be Done Now?
This is a temporary annoyance that will run its course as the weather continues to warm. Ladybugs, cluster/face flies, and stink/leaf-footed bugs characteristically do not bite, sting, or carry diseases, nor do they infest food, clothing or wood. They do not breed (reproduce) inside buildings and generally will not survive indoors more than a few days. Yellowjackets or paper wasps spotted indoors this time of year are overwintering queens, attempting to get outdoors to initiate their spring nests. The emerging queens are not normally aggressive, but will sting if mishandled.

The easiest way to dispose of these overwintering insects found indoors is with a vacuum cleaner, broom or fly swatter. Insecticides are not generally recommended unless the temporary annoyance can no longer be tolerated. Aerosol-type foggers containing pyrethrins may be of some benefit in severely infested attics, but will provide no residual control of insects that have not yet emerged from cracks and other protected locations. Large numbers of lady beetles, flies or wasps accumulating in ceiling light fixtures would suggest the attic as a possible treatment area. Insect light traps supplied by pest control firms can also be installed in such areas, although they too may be of limited benefit. Aerosol sprays or foggers are not recommended for treatment of bedrooms, kitchens, or other living areas within the home. The effect of such treatment would be negligible against any insects which have not yet emerged from wall voids and other hidden locations. Flies or ladybugs spotted on walls, windows, and exposed surfaces can just as easily be removed with a vacuum or fly swatter.

What Can Be Done To Prevent Future Problems?
It is hard to predict whether structures experiencing problems this year will have problems next year. Since most of these pests seek out overwintering sites in late-summer/ fall, cracks and other openings can be sealed as a preventive measure. Use a good quality silicone or silicone-latex caulk to seal cracks around windows, doors, siding, fascia boards, utility pipes, wires, and other openings. Repair damaged window screens and install insect screening behind attic vents (See Entfact-641, How to Pest-Proof Your Home).
While sealing and weatherstripping can help limit pest entry, the approach is time-consuming and often impractical. There are countless cracks and crevices under and around eaves, siding, vents, etc., where overwintering insects can enter. On multi-story buildings, sealing becomes especially difficult. Households or businesses that do not wish to chance a reoccurring problem with overwintering flies or lady beetles next season may want to enlist the services of a knowledgeable pest control firm. Many companies offer strategically placed insecticide treatments to the building exterior, which helps prevent pest sightings indoors. Long-lasting, rapid-knockdown formulations of pyrethroid insecticides can be professionally applied around eaves, attic vents, windows, siding, and other likely points of entry. The key is to apply the treatments in late September or early October, before pests enter buildings to overwinter. Such treatments would be ineffective at this point (late winter), since the overwintered pests are already indoors.

People have varying levels of tolerance toward insects in their homes. Hospitals, food processors, and other “high-clean” establishments have zero tolerance for contaminants of any kind. Vacuuming, fly swatters and pest proofing, supplemented by client education, are the preferred methods of dealing with overwintering insects infesting structures in Kentucky. Insecticides should be used only when the situation warrants, and prescribed as indicated above.

**EASTERN TENT CATERPILLAR CONTROL FOR HOMEOWNERS**

By Lee Townsend

Eastern tent caterpillar eggs will begin to hatch as buds break open on wild cherry, ornamental apple, crabapple, plum, peach, and cherry in landscapes. The caterpillars will feed over the next four to six weeks, increasing the size of their tents or nests as they grow. Controlling tent caterpillars early in their development will keep them from defoliation trees or becoming a nuisance later in the spring when the large full grown caterpillars leave trees to find a site to pupate.

Limited numbers of tents in small trees can be pulled from the forks of branches and dropped into a bucket of soapy water. This should be done when most of the caterpillars are in the tents. Wear gloves because the hairs on the caterpillars can irritate the skin of some people.

A wide variety of insecticides are labeled for tent caterpillar control. Be sure the trees that you want to spray are on the label. Some of the choices are - Bulls Eye BioInsecticide or Conserve Naturalyte Insecticide Concentrate (spinosad), Advanced Tree and Shrub Insect Control Concentrate (cyfluthrin), Ortho Bug Be Gon Liquid Concentrate (esfenvalerate), Spectracide Bug Stop Multi Purpose Insect Control Concentrate (permethrin), and various formulations of Bt (Bacillus thuringiensis), such as Dipel.

Treat when the tents are about the size of a baseball or softball. Products containing spinosad or Bt need to be eaten by the caterpillars so the foliage around the tents needs to be treated. The other products are synthetic pyrethroids so the can work by direct contact with the caterpillars or as stomach poisons when treated leaves are eaten by the worms.

**DIAGNOSTIC LAB HIGHLIGHTS**

by Julie Beale and Paul Bachi

We are seeing a trickle of diagnostic samples as is typical in the winter months. The "slow time" in January and February allows the diagnosticians to concentrate on research and administrative (i.e., "paperwork") responsibilities and prepare the labs for the busy spring and summer months ahead. It won't be long before spring disease samples start pouring in! Recently, we have seen samples of powdery mildew on Kentucky bluegrass, yellow patch on creeping bentgrass, black root rot on vinca cuttings, Rhizoctonia root rot on boxwood cuttings, Botryosphaeria canker on crabapple, scab on lemon (indoor plant) and Rhizoctonia damping off on cabbage seedlings.