



# KENTUCKY PEST NEWS

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## CORN

### REGISTRATION OF QUADRIS ON CORN by Paul Vincelli

Quadris® Flowable Fungicide recently received a federal label for control of several foliar diseases of corn. It is labeled for use on field corn, popcorn, and sweet corn for control of common rust at 6.2-9.2 fl oz/A and for gray leaf spot and certain other diseases at 9.2-15.4 fl oz/A. In all cases the label directs the user to apply the product at disease onset. The product can be used until 7 days of harvest. Other directions and restrictions are described on the label.

Of particular interest to some Kentucky producers is its activity against gray leaf spot of corn, an important disease on field corn in our state. In a cooperative effort with Wheat-Tech in Russelville, we have conducted four tests over two years with this product for gray leaf spot control. Unfortunately, severe drought conditions both years prevented us from getting meaningful efficacy data. Therefore, we do not yet have data on Quadris's ability to control gray leaf spot under Kentucky conditions. However, our UK tests do indicate that the product will neither harm nor help the crop (ie, phytotoxicity or growth-regulator effects) in the absence of significant disease pressure, since yield and quality parameters were

unaffected by Quadris in white corn and high-oil corn in the tests we conducted.

Quadris has been tested in university research trials in several adjoining states by respected colleagues. These trials provide a basis for some comments about the material at this time. Recognize that these trials are typically conducted on highly susceptible hybrids under continuous no-till corn. Such test conditions greatly favor gray leaf spot development, and therefore provide more yield benefit from the fungicide than many growers will experience.

Although Quadris can be applied more than once per season, and in some tests two applications provided better disease control than one, in most tests there was no additional yield benefit from the second application. Based on the studies I've reviewed, my judgement is that the most economical use of the product on susceptible hybrids is to make a single application of Quadris at 9.3 fl oz/A made sometime between the V10 (about head height) and V14 stage, if scouting indicates the disease is present at least halfway up the plant. Keep in mind that most of the yield potential in corn comes from the uppermost leaves so those are the ones that need protection. The label suggests that an adjuvant be added to improve coverage. I've seen data showing enhanced control of gray leaf spot using Quadris when a nonionic surfactant is added, so I would strongly suggest this. Along



those lines, adding drop nozzles to improve coverage may improve results.

In several (though not all) tests, Quadris provided superior disease control to that provided by Tilt® fungicide, a material some corn producers have used in their fields. Thus, in terms of efficacy against gray leaf spot, Quadris may prove to be the better choice. However, because Quadris is used at an application rate over twice that of Tilt, the per-acre cost of Quadris is about twice as high as that of Tilt (according to current prices in Lexington). Thus, if a producer wishes to treat her/his corn for gray leaf spot, s/he will have to balance the cost/efficacy equation carefully.

Common rust of corn is another disease on the Quadris label. In a test conducted this summer in seed corn by Dr. Greg Shaner at Purdue University, Quadris provided greatly improved control of common rust as compared to Tilt. Another colleague, Dr. Pat Lipps from The Ohio State University, also considers Quadris to be a strong product against common rust. In any case, we usually do not have enough common rust on field corn in Kentucky to justify a fungicide treatment, although this may be the product of choice for fields where this disease is of concern.

Thanks to Drs. Pat Lipps, Greg Shaner, and Eric Stromberg for reviewing an early draft of this article.

## **FRUIT**

### **CONTROLLING CODLING MOTH: CHANGING TIMES by Ric Bessin**

Control of codling moth is changing. The use of organophosphate insecticides on apples has received considerable attention because of the Food Quality Protection Act of 1996. Because of this, Lorsban applications have been restricted to prebloom only and new restrictions have been placed on Guthion. Another organophosphate insecticide that is used for codling moth control in apples and pears is Imidan. In the past, a grower would wait until 250 degree days after biofix to apply one of these organophosphate insecticides. Danitol 2.4 EC is also available to be applied at this time (See KPN 874), but it is a pyrethroid insecticide.

Two new insect growth regulators are now available for control of codling moth on apples and pears. These are Confirm 2F and Intrepid 2F which are produced by the Rohm and Haas. Both of these

products are classified as General Use insecticides, have a four hour reentry interval, and a 14 day preharvest interval. They are effective against lepidopterous larvae by causing them to molt prematurely. Spray timing of Confirm and Intrepid is much different than that of Guthion, Imidan or Danitol. These products are applied at 100 to 200 degree days after biofix. A second application is then applied 10 to 15 days following the first. This may be 4 to 10 days before the 250 degree day application date. Precise timing for these newer, selective products is much more important than with the earlier broad-spectrum sprays. It will be necessary for growers to use these products in combination with pheromone trapping in order to monitor codling moth adult activity and time applications properly.

Another newly registered insect growth regulator for codling moth control in apples and pears is Esteem. This is for first generation control only. This product also has a different timing of its application and is discussed in the following article.

### **SAN JOSE SCALE CONTROL ON APPLES by Ric Bessin**

In the past, apple and pear growers had used Lorsban 50W to control San Jose scale crawlers either in the last week of May or the first week of June. But new restrictions on Lorsban now limit its use to before bloom applications only. That have left us with only diazinon for scale control during the season. To compound this, San Jose scale problems have been increasing in commercial orchards the past few years.

A new product, called Esteem 0.86 EC, has recently been registered for San Jose scale control in apples and pears. It also controls aphids and first generation codling moth. The active ingredient is pyriproxyfen and it acts as a selective insect growth regulator. It bears the 'CAUTION' signal word and is classified as a General Use Pesticide. It has a 12 hour reentry interval, 45 day preharvest interval, a limit of 2 applications per season, and a minimum of 14 days between applications.

For San Jose scale control, it can be applied as a delayed dormant application or during the season when scale crawlers are active. Because it is an insect growth regulator, it does not control the adult stage. The delayed dormant application can be applied in oil and oils can be applied until about the half inch green stage. Applied at this time it will also help to control aphids. During the growing season it should be applied when crawlers are active and control can be improved if mixed with

oil. However, growers are cautioned to use oils carefully during this period to avoid crop injury.

Esteem can also be used to control first generation codling moth, but timing for this application is much different than what we have done in the past. Esteem should be applied 100 degree days after biofix. Biofix is the date when the fifth codling moth is captured in a pheromone trap. Other insecticides for codling moth control, such as Guthion, Imidan, and Danitol, are applied 250 degree days after biofix.

## **LAWN & TURF**

### **RUST AND FAIRY RINGS ARE VERY NOTICEABLE IN SOME LAWNS**

by Paul Vincelli

Leaf rust is very common now on perennial ryegrass and Kentucky bluegrass in many areas. This disease causes the turf to have an overall yellowish-green appearance. Close inspection of leaf blades reveals rusty-colored pustules erupting from the leaf surface. The rust pustules are most abundant towards leaf tips.

Rust infections are common on these two grasses in late summer and autumn. It is not a lethal disease by any means, but does provide some overall stress to the grass at a time when it should be growing well to recover from summer stresses. Rust typically is notable only on slowly growing turfgrasses, especially those experiencing a lack of water or insufficient nitrogen fertilizer. Normally, a program of fall fertility (beginning in early October or sooner, in some cases) keeps the grass growing quickly enough that it outgrows the rust infections, which are mowed off before they become serious. The dry weather some areas have experienced this autumn certainly compounds the disease.

Fairy rings, circles or arcs of dark green grass, are also very evident in under-fertilized lawns. Sometimes the arcs and rings may have dead or drought-stressed grass, as well. Fairy rings are caused by certain mushroom-producing fungi. These fungi inhabit the soil and feed on decaying organic matter in the soil, and in that sense, they serve an important ecological role.

While they don't actually infect the roots of affected grasses, fairy ring fungi cause symptoms which may be undesirable for some. The dark green color is due to the release of nitrogen as the fungi decompose organic matter. The drought-stress or

dead grass is due to the fungi producing a hydrophobic coating on soil particles, which repels water and causes drought stress on the grass in the vicinity of the fungus.

The best approach to both leaf rust and fairy ring at this time of the year is simply to assure that the sward has an adequate level of nitrogen fertilizer through December. A normal, moderate fertility program for a cool-season grass would be to apply 1 to 1.5 lb nitrogen per 1000 sq ft in October and again in December, with a quick-release fertilizer in both cases. While the October window has past, it isn't too late to put out a single application now of 1 to 1.5 lb nitrogen to prepare the turf for winter.

## **SHADE TREES & ORNAMENTALS**

### **WILL INJECTIONS SAVE OAKS FROM BACTERIAL LEAF SCORCH?**

by John Hartman

Bacterial leaf scorch, caused by *Xylella fastidiosa* (exacerbated by last year's drought and possibly by recent mild winters), has devastated many oaks in Kentucky's urban forests. With the decade-long epidemic showing no signs of abating, County Extension Agents and homeowners naturally want to know if there are any treatments that would arrest the disease and save their trees. Some homeowners are aware that tree treatment antibiotics or other injectable materials might be available to help their trees.

There are commercial tree-injection products containing the antibiotic oxytetracycline which are sold and used for management of bacterial leaf scorch disease. Injections are made into the root flare at the base of the tree by drilling holes (1/64 inch diameter by 3/8 inch deep), inserting a plastic feeder tube, and attaching a cylindrical pressurized plastic capsule containing about a teaspoonful of chemical. After a few days, the tubes and capsules are removed. Several different kinds of injection capsules containing insecticides, fungicides, fertilizers, or antibiotics are available on the market. Indeed, some homeowners are convinced (perhaps by unscrupulous, non-certified arborists) that treatments with fungicides or fertilizers (which are not the same as oxytetracycline) will "cure" bacterial leaf scorch.

Research shows that in some circumstances, oxytetracycline will suppress *Xylella*, and when injected into infected trees, may provide temporary remission of symptoms. Thus, if effective, the

antibiotic would need to be re-injected, perhaps annually or more often. In Kentucky, we have observed that pin oaks and red oaks treated with antibiotic injections show little or no remission of symptoms and continue to decline. Researchers with the National Park Service who are combating this disease in elms on the Mall in Washington D.C. have not found injections to be an effective long-term solution. It is difficult to do scientifically valid research on this disease in mature oaks because of the need for long-term commitment of time and considerable resources to such a project. This is why there is little research on bacterial leaf scorch treatments.

Research has shown that injections by themselves can cause long-term problems for trees. Dr. Alex Shigo, in his book, *Modern Arboriculture*, indicates that the long columns of discolored and decayed wood associated with the holes can greatly reduce the amount of wood available for storage of energy. Thus, the injection holes may be ports of entry for rot organisms. Even when rot organisms do not invade, areas of the wood behind the injection point are rendered discolored and non-functional. This dieback, staining, or infection is usually confined to a small column and can be minimized by keeping the holes as small as possible, drilling low on the tree, and avoiding vertical alignment of holes from previous treatments. However, if frequent re-treatment is required, considerable damage is likely to be caused by injection over the life of a tree.

Thus, lacking positive research results, and because injections inherently damage trees, we are not advocating use of antibiotic injections for bacterial leaf scorch. Hopefully, future research will reveal solutions to the problem of bacterial leaf scorch in our urban forests.

## HOUSEHOLD

### THERE'S A HOLE IN MY SWEATER!

By Mike Potter

With the onset of cold weather, clients will be calling about 'bugs' infesting their clothing and other items unpacked from storage. These are probably clothes moths or carpet beetles. Besides damaging fabric, these insects will feed on any item composed of animal fibers, e.g., wool, fur, silk, feathers, felt or leather. Items commonly infested include wool sweaters, coats, blankets, carpets, down pillows and comforters, upholstered

furniture, toys and animal trophies. Cotton and synthetic fabrics, such as polyester and rayon, are rarely attacked unless blended with wool, or if they are heavily soiled with food stains or body oils. Serious infestations of clothes moths and carpet beetles can develop undetected in a home, often causing irreparable damage to clothing, bedding, rugs, and other articles.

### THE CULPRITS

Carpet beetles - Carpet beetles are very common in structures, and may infest many items in addition to fabrics. Larvae are about 1/8 to 1/4-inch long, tan to brownish in color, and *densely covered with hairs or bristles*. This is the life stage likely to be encountered now since only the larvae feed on fabrics and cause damage. Oftentimes, only the shed (molted) skins of the larvae are present on the damaged item. Adult carpet beetles feed primarily on flowers and are usually discovered indoors during the spring. The adult beetles are small (1/16 to 1/8-inch) and oval-shaped, ranging in color from black- to various patterns of white, brown, yellow and orange. Large numbers may be spotted around light fixtures and windows, indicating that an infestation is present somewhere within the home.

Clothes moths- Clothes moths are small, 1/2-inch, buff-colored moths with narrow wings fringed with hairs. Like carpet beetles, they damage fabric only in the larval stage. Adult clothes moths are seldom seen because they avoid light, preferring to hide in dark places such as the backs of closets. *Clients who report seeing tiny moths in the kitchen and other well-lighted areas are probably seeing grain moths originating from stored foods, e.g., cereal, dried fruit, nuts, or pet food.* Clothes moth larvae spin silken feeding tubes or patches of webbing as they move about on the surface of fabrics. They also deposit tiny fecal pellets similar in color to the fabric.

### THE SOLUTION

Current infestations- *Controlling an existing fabric pest problem requires diligence and a thorough inspection to locate all infested items and areas of infestation.* The source may be an old woolen scarf at the back of a closet, a fur or felt hat in a box, an unused remnant of wool carpeting, or an abandoned bird or squirrel nest up in the attic. Larvae prefer to feed in dark, undisturbed areas where susceptible items are stored for long periods. Larvae also may be found living beneath the edges of carpeting (use needle-

nose pliers to lift the outer edge of the carpet from the tack strip along baseboards), underneath and within upholstered furniture, or inside heat ducts and floor vents where they often feed upon accumulations of lint, pet hair and other bits of debris. Occasionally, infestations may originate from bird or animal nests or carcasses present in an attic, chimney or wall void. Carpet beetles, in particular, will also feed on pet food, bird seed, and grain/cereal products associated with the kitchen, basement or garage.

Infested items should be laundered, dry-cleaned or thrown out. Laundering (hot cycle) or dry-cleaning kills any eggs or larvae that may be present. Vacuuming floors, carpets, and inside heating vents effectively removes larvae as well as hair and lint which could support future infestations. Be sure to vacuum along and beneath edges of carpets, along baseboards, underneath furniture and stored items, and inside closets and 'quiet' areas where carpet beetles and clothes moths prefer to feed.

Insecticides applied to infested areas may be helpful as a supplement to good housekeeping. Products containing active ingredients labeled for flea control (e.g., permethrin) are effective. Sprays may be applied to carpets, especially along and beneath edges adjacent to baseboards, underneath furniture, and other likely areas of infestation where prolonged contact with humans is unlikely. Clothing and bedding should not be sprayed with household insecticides and should be removed before treatment.

Avoiding future problems- The best way to avoid future problems with fabric pests is through prevention. Woolens and other susceptible fabrics should be dry-cleaned or laundered before being stored for long periods. Cleaning kills any eggs or larvae that may be present and also removes perspiration odors that tend to attract pests. Articles to be stored should then be packed in tight-fitting containers, preferably with moth balls or flakes containing paradichlorobenzene (PDB) or naphthalene. The vapors from these materials are only effective if maintained at sufficient concentrations. Effective concentrations can best be achieved by sealing susceptible items (with the manufacturers' recommended dosage of moth crystals) in large plastic bags, and then storing the bagged articles in tight-fitting trunks, boxes or chests. Contrary to popular belief, cedar closets or chests are seldom effective by themselves because

the seal is insufficient to maintain lethal or repellent concentrations of the volatile oil of cedar.

Conventional household insecticides should not be used to treat clothing; however, mothproofing solutions may be applied to susceptible clothing by professional dry cleaners. Valuable garments such as furs can be protected from these pests by storing them in cold vaults — a service offered by some furriers and department stores.

Additional tips on fabric pest prevention, control, and repair of damage can be found in the publication IP-50, *Fabric Insect Pests*. Elimination of widespread, persistent infestations of carpet beetles and clothes moths in a home or commercial establishment may require the services of a professional pest control operator.

## **DIAGNOSTIC LAB HIGHLIGHTS**

**By Julie Beale and Paul Bachi**

Recent samples in the Diagnostic Lab have included Gibberella stalk rot and stress-related symptoms on corn; purple seed stain (*Cercospora*) and charcoal rot on soybean; *Septoria* leaf spot on strawberry; soft rot (*Erwinia*) on broccoli; *Pythium* root rot on poinsettia; *Cercospora* leaf spot on hibiscus; *Entomosporium* leaf spot on photinia; tip blight on pine; *Actinopelte* leaf spot and powdery mildew on oak; and numerous samples of bacterial leaf scorch on oak (some on maple as well).



Lee Townsend, Extension Entomologist

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