LICENSE RENEWAL TIME IS APPROACHING

By Ken Franks, Ag Branch Manager
Division of Pesticide Regulation,
Kentucky Department of Agriculture

Once again, license renewal time is coming up. The Kentucky Department of Agriculture’s Division of Pesticide Regulation has continued to make changes to the new system, and should be ready to renew licenses in record time.

There are a few things all license holders should know. All renewal forms must be signed and returned to this office with the appropriate fees attached. Any renewal forms not returned by March 1 will be assessed a 25 percent late penalty. Any form returned later than June 1 will not be renewed. Instead, that person will be required to take the licensing examination again and to start as a new applicant. These requirements are not negotiable.

Last year, some problems were experienced with non-commercial license holders not returning their renewals. These individuals included employees of government, golf courses, public utilities and universities. These licenses are free, but the license holder must still sign and return the form.

My staff will be processing renewals in the order they come into our office. If corrections to your renewal are needed, there is space on the right side of the form to do so. Please be sure to write your information legibly. If you need to talk to someone regarding your renewal, please call (502) 564-7274 and ask for Shelley. Have your company number ready when you call. This will greatly speed up the process.

CONTINUING EDUCATION OPPORTUNITIES

November 15 - Fayette Co Extension Office
This meeting has been approved for 6 hours of credit in Categories 3 (Turf and Ornamental), 10 (Demonstration and Research), 12 Pesticide Sales Agent, 18 Golf Course, 19 (Interior Plantscape) and 20 (Sports Turf). Topics will include greenhouse pest problems. The program begins at 9 am and ends at 3:30 pm (local time).

December 9 - 10, Executive Inn, Owensboro
Kentuckiana Crop Production Seminar - 6 total credits (4 general, 2 specific) for Categories 1A - Ag Plant Pest Control, 10- Demonstration and Research, and 12 - Pesticide Sales Agent. For details contact Tod Griffin, KFACA, (502) 226-1122 or tgriffin@kyretail.com

FORAGE CROPS

GRAY LEAF SPOT OUTBREAKS IN ANNUAL RYEGRASS
by Paul Vincelli

Some Kentucky producers have been experimenting recently with annual ryegrass as part of a year-round grazing system. Annual ryegrass, like its close relative perennial ryegrass, is highly susceptible to gray leaf spot disease, which has wreaked havoc on turf-type perennial ryegrass swards throughout most of the range of this grass east of
the Rocky Mountains. Unfortunately, the period of humid weather generally experienced since mid-September has been very favorable for this disease, and very damaging losses of new seedings have been documented in southern Kentucky. Apparently there are no reports of significant losses in perennial ryegrass in central Kentucky horse pastures, but it is something to be aware of.

We know several things about this disease:
1. It causes leaf spots that turn to leaf blight. Spots are commonly round to diamond-shaped, with a light-colored center.
2. Seedlings of host grasses are very susceptible, so they are most at-risk to infection, disease, and death.
3. Based on previous research, it is safe to assume that all commercially available cultivars of annual ryegrass and perennial ryegrass are susceptible to highly susceptible.

There is still much to learn about this disease in forage crops in Kentucky. UK plant pathologists are conducting research to determine whether the strains of the fungus Pyricularia grisea attacking annual ryegrass in Kentucky are the same as those that attack perennial ryegrass and tall fescue. Tall fescue is a host to the strains that attack perennial ryegrass but it is typically not seriously affected by the disease in Kentucky. This research will help us better understand whether producers can safely seed annual ryegrass into tall fescue pastures.

We are also testing susceptibility of various species of forage grasses to the strains of Pyricularia grisea collected from annual ryegrass. Included in these tests will be interspecific hybrids that are commonly on the market, such as the cultivar ‘Duo’. We hope these tests will better elucidate which grasses and cultivars producers can use as an alternative to susceptible cultivars of annual ryegrass.

I hope to be able to extend the results of these tests before the winter ends.

LAWN & TURF

FUNGICIDE-RESISTANT ANTHRACNOSE
by Paul Vincelli

We recently confirmed our first case of Colletotrichum graminicola from turfgrass with resistance to QoI fungicides, from a golf course in Louisville. QoI fungicides are also called strobilurin fungicides and include Heritage (azoxystrobin) and Compass (trifloxystrobin). Dr. Lee Burpee from the University of Georgia, who ran the lab tests, also confirmed that the strain was resistant to thiophanate-methyl.

C. graminicola causes basal anthracnose, which can be a serious problem on putting greens. Although basal anthracnose is commonly regarded as a problem on annual bluegrass, it can sometimes be a serious problem on creeping bentgrass. Furthermore, sometimes one observes putting greens with basal anthracnose on the creeping bentgrass but not the annual bluegrass, and other sites where the reverse is true. This is because some strains of C. graminicola preferentially attack one grass or the other. Of course, strains exist that attack both equally well.

Current data suggests that strains of C. graminicola resistant to QoI fungicides have shown up in numerous locations in several states. Although we are past the anthracnose season now, at least on creeping bentgrass, superintendents are cautioned to be aware of this possibility, and to have samples tested for fungicide resistance if control failures occur.

Dr. Burpee reported to me that most strains of C. graminicola that he has tested resistant to QoI fungicides are also resistant to thiophanate-methyl, which leaves relatively few disease control options. Applications of 1 oz of Banner MAXX plus 2.75-3.2 oz Daconil under high pressure conditions at biweekly intervals are an option. Under hot, stressful weather it would be wise to reduce the Banner rate, especially if other stresses (hot spots, etc) are expected, and don’t use any growth regulator except Primo, which shouldn’t interact with Banner. The lower rate of Daconil makes sense under lower disease pressure, so as to not run into the seasonal total (no more than 88 lb Daconil Ultrex/A are over the season on greens). On bentgrass, these applications should be started no later than Memorial Day on sites with a history of the disease. On annual bluegrass, applications may need to begin as early as early March. Conditions that are favorable for infection activity include warm temperatures with high humidity, especially during or following a period of extended overcast weather.

Stress reduction can help greatly for control of basal anthracnose. Practices that can help include:
* managing foot traffic to reduce wear on entry/exit sites
* avoiding mowing wet/ spongy greens
* raising mowing heights and using solid rollers
* spoon-feed nitrogen in summer, 0.1-0.125 lb N/ 1000 sq ft every 10-14 days.
* avoiding plant growth regulators and abrasive practices when the disease is active
* cutting back on irrigation

HOUSEHOLD

A MOUSE IN THE HOUSE
by Mike Potter

For householders, cold weather offers a reprieve from most
insect pests. Not so in the case of mice. The house mouse is remarkably well-adapted for living year round in homes, retail establishments and other structures. Homeowners are especially likely to notice mice during fall and winter, following their migration indoors in search of warmth, food and shelter. Once mice become established indoors, they can be extremely difficult to control.

**Reasons to Control Mice**

Although most people consider mice less objectionable than rats, mice are more common and cause significantly more damage. Mice are prolific breeders, producing 6 to 10 litters continuously throughout the year, with 4 to 7 young per litter. The greatest economic loss is not from how much these rodents eat, but what must be thrown out because of damage or contamination. Food, clothing, furniture, books, and many other items are contaminated by their droppings and urine or damaged by their gnawing. House mice gnaw through electrical wiring, causing fires, power outages, and equipment failures. Entire communication systems of corporations have been shut down as a result of their gnawing. Mice can also transmit diseases, most notably salmonellosis (bacterial food poisoning), when food is contaminated by infected rodent feces. Hantavirus, although rare in the Midwest, is an often fatal disease acquired through the urine, dropping, and nesting materials of field mice.

Mice often store large quantities of seeds, nuts, pet food, etc., behind walls, between floors, and in other concealed locations. This can lead to serious and difficult to control infestations of stored product insects.

**Behavior Pertinent to Control**

Mice are nocturnal creatures and may not be seen by the homeowner. The most obvious indicators of their presence are droppings (1/8- to 1/4 inch long, dark, and pointed at one or both ends), sounds of them running, gnawing or squeaking, or damage to stored food or materials used for nesting.

Compared to rats, mice forage only short distances from their nest, usually not more than 10-25 feet. When food and shelter are adequate, their foraging range may be only a few feet. For this reason, traps and other control devices must be placed in areas where mouse activity is most apparent. Mice prefer to travel adjacent to walls and edges, and are particularly fond of corners – another important point to remember when positioning control devices. Mice are very inquisitive and will investigate each new object placed in their foraging territory. Therefore, if control devices are not successful, try moving them to a different location.

Mice feed on a wide variety of foods but prefer seeds and cereal grains. They are also fond of nuts and sweets (dabs of peanut butter, a piece of chocolate, or a cotton ball sweetened with cherry or strawberry flavoring extract are excellent baits for snap traps). Cotton balls are also good 'lures' for pregnant female mice foraging for nesting materials. Mice are "nibblers" and may make 20 to 30 visits to different food sites each night.

**Control Tactics**

To control mice, you must "think like a mouse," keeping in mind the behavioral traits noted above. The best way to avoid rodent problems in buildings is to prevent their entry. Mice are able to squeeze through extremely small openings no wider than the diameter of a pencil (1/4-inch). Cracks and openings under entry and garage doors, around windows, vents, and where utility lines enter the building should all be sealed (See Entfact 641-H ow to Pest-Proof Y our H omes).

Good sanitation and food storage practices are helpful in reducing problems with mice. Bird seed and pet food bags stored in the garage or basement are especially prone to infestation. Since weed seeds are a favored food and also serve as rodent harborage, weeds and unnecessary vegetation next to the foundation should be eliminated. However, because mice are able to occupy such small nesting areas and survive on minute amounts of food, sanitation alone will not normally eliminate an existing infestation.

Other than calling a professional pest control firm, householders have two basic options available for ridding their premises of mice: 1) traps, or 2) toxic baits known as rodenticides. Traps are generally preferred to rodenticides when you suspect only a small number of mice are present. Traps tend to be less hazardous to use around children and pets, and because mice are captured by the trap, they are not as likely to die in walls or other inaccessible areas and create odors. Snap traps are widely available and easy to use. Trapping efficiency can be enhanced by baiting the trigger with such foods as peanut butter, chocolate or raisins. Snap traps with an expanded, plastic trigger catch significantly more mice than non expanded trigger designs. Other new 'quick set' designs are also available that allow for much easier setting and disposal of mice which have been captured. Snap traps should be oriented perpendicular to the wall, with the trigger end against the vertical surface.

Another effective trap against heavy infestations of mice is the automatic, multiple-catch trap, available at many hardware and farm-supply stores. Mice enter these traps out of curiosity for new objects placed in their territory. One type of multiple-catch trap requires winding and flips mice into a holding chamber. A newer model operates using the principle of a trap door. Both devices can capture and hold...
several mice before needing to be emptied. Multiple-catch traps can be oriented with the entrance hole perpendicular or parallel to the wall.

Glue traps offer yet another trap option, but tend to be less effective than snap traps or toxic baits. Some mice, particularly the adults, tend to avoid gluey surfaces placed in their pathway. Moreover, mice caught at the edge of the board sometimes escape. Compared to snap traps, death is usually more prolonged (and inhumane), with the mouse dying of suffocation or trauma. Should the glue from a glue board contact the fur of a pet or the skin of a child, it can be removed with mineral or cooking oil.

Regardless of which type of trap is used, placements should be installed up against walls, behind objects and appliances, and in secluded areas where droppings, damage, and other signs of mice are evident. Since mice forage only short distances from their nests, optimum results are achieved with multiple placements as close to the mouse harborage as possible. The biggest mistake people make is using too few traps. Minor infestations in a garage or basement typically require about 6-12 traps; moderate-to-heavy infestations often require dozens. Traps and glue boards should be checked daily, and dead mice disposed in plastic bags. Gloves should be worn when handling rodent carcasses to prevent any chance of disease spread.

Toxic baits, known as rodenticides, are also available for mouse control. Several formulations are available containing seeds or grain as the attractant. They come packaged for use either in individual, sealed cellophane or paper packets, as loose bait, or molded into extruded blocks. Most rodenticides sold over the counter are anticoagulants containing brodifacoum, bromadiolone, chlorophacinone, difethialone or warfarin as active ingredients. They kill by interfering with normal clotting of the rodents’ blood, causing the rodent to die of internal bleeding.

Recommendations for effective bait placement are similar to those for traps. In addition, extreme care must be taken to position baits in areas inaccessible to children, pets, and wildlife. Dogs, in particular, will seek out and find baits placed in areas that are seemingly inaccessible to humans. For optimal results and safer use, mouse bait should ideally be confined in an enclosed plastic bait box or station, preferably one which is tamper resistant. These are often carried by hardware and farm supply stores. Difficult or persistent mouse infestations are often best left to professionals, since nesting sites often are located in attics, crawlspaces and other hard-to-access locations.

**PESTICIDE NEWS & VIEWS**

**BIOLOGICAL CONTROL PRODUCTS**

**AVAILABLE FOR PLANT DISEASE MANAGEMENT**

by John Hartman, William Nemesmith, Paul Vincelli, and Don Hershman

Growers, both “organic” and “conventional,” frequently ask if there are any biological control (biocontrol) products available for plant disease management in the field, orchard and greenhouse. Until recently, there were few such products, but continuing research and development by university, government and industry scientists has increased the choices available. The following list provides a summary of commercially available biocontrol products for various plant disease management uses. The information for this list was assembled by the Biological Control Committee of the American Phytopathological Society and posted on the Web by Dr. Brian McSpadden Gardener of Ohio State University. More information on these materials may be found on their web site at www.oardc.ohio-state.edu/apsbcc/productlist.htm.

In general, biological control products that have been tested have been shown to reduce disease pressure in many circumstances, but are often not as effective as synthetic fungicides. For some of these products, appropriate scientific test results are simply not available. In some circumstances, they are ineffective for some of the uses labeled or need to be applied very frequently to work. However, when integrated into a complete disease management program, biocontrols may allow reduced use of other products. Because biocontrol products sometimes work only in specific circumstances, growers wishing to use them are urged to first try them out on a small portion of their crop in a manner that demonstrates efficacy.

Mention of a trademark or proprietary product does not constitute a guarantee or warranty of the product and does not imply approval to the exclusion of other products that may also be suitable. These products may or may not have EPA approval for the crops listed here. Always read the label before purchasing or using disease management products. This list does not include mineral products such as sulfur or copper compounds which are also suitable for organic crop production.

**Products that activate plant defense mechanisms**

- **Actigard** contains aclbensolar-S-methyl. It is intended for many diseases of tobacco, tomato, lettuce, and spinach and is applied as a spray or drench. Manufacturer/Distributor: Syngenta Crop Protection P.O. Box 18300, Greensboro, NC 27419. Internet: www.syngentacropprotection-us.com/
- **Messenger** utilizes Erwinia amylovora HrpN harpin protein. It is intended for many diseases of field, ornamental, and vegetable crops and is applied as a drench or spray. Manufacturer/Distributor: EDEN
Products for powdery mildew management


Products for management of foliar diseases

- **BioJect Spot-Less** utilizes Pseudomonas aureofaciens. It is intended for dollar spot, anthracnose, Pythium aphanidermatum, and Microdochium patch (pink snow mold) of turf and other crops. It is applied via over-head irrigation and can only be used with the BioJect Automatic Fermentation System. Manufacturer/Distributor: Eco Soil Systems, Inc. 10740 Thornmint Rd., San Diego, CA 92127 USA; Phone 1-800-331-8773; FAX 858 675-1662. Internet - www.ecosoil.com

- **BlightBan A506** utilizes Pseudomonas fluorescens A506. It is intended for frost damage, Erwinia amylovora, and russet-inducing bacteria of almond, apple, apricot, blueberry, cherry, peach, pear, potato, strawberry, and tomato. It is applied as a spray of the flowers and fruit. Manufacturer/Distributor: NuFarm Inc., 1-708-754-3330. Internet - www.nufarm.com

- **Cedemon** utilizes Pseudomonas chlororaphis. It is intended as a seed dressing for leaf stripe, net blotch, Fusarium sp., spot blotch, leaf spot, and other diseases of barley and oats with potential for other cereals. Manufacturer/Distributor: BioAgri AB, P.O. Box 914; visiting address: Dag Hammarskjolds 180 SE-751 09 Uppsala, Sweden; Phone 46(0) 18-67 49 00; FAX 46(0) 18-67 49 01. Internet - www.bioagri.se


- **Serenade** utilizes Bacillus subtilis. It is intended for powdery mildew, downy mildew, Cercospora leaf spot, early blight, late blight, brown rot, fire blight, and other diseases of cucurbits, grapes, hops, vegetables, peanuts, pome fruits, stone fruits, and others. It is applied as a spray. Manufacturer/Distributor: AgraQuest, Inc., 1530 Drew Avenue, Davis, CA 95616 USA; Phone 1-530-750-0150; FAX 1-530-750-0153. Internet - www.agraquest.com

- **Trichodex** utilizes Trichoderma harzianum. It is used as a spray intended primarily for Botrytis cinerea, but also for Collectotrichum spp., Fulvia fulva, Monilia laxa, Plasmopara viticola, Pseudoperonospora cubensis, Rhizopus stolonifer, and Sclerotinia sclerotiorum diseases of cucumber, grape, nectarine, soybean, strawberry, sunflower, and tomato. Manufacturer/Distributor: Makhteshim Chemical Works, Ltd., P.O. Box 60, Beer Sheva, Israel; Phone (Main Office) 972-3-5179351; (Factory) 972-7-6206615; (U.S. Office): 551 5th Ave. Suite 1100, New York, NY 10175; Phone 1-212-661-9800; Distributor: BiocVest, Inc. Leamington, ON. Email - daye@on.albn.com

Products for management of soilborne diseases


- **Biofox C** utilizes Fusarium oxysporum (nonpathogenic). Incorporated into soil or as a seed treatment it is intended for Fusarium oxysporum, and Fusarium moniliforme diseases of basil, carnation, cyclamen, and tomato. Manufacturer/Distributor: S.I.A.P.A., Via Vitorio Veneto 1 Galliera, 40010, Bologna, Italy; Phone 39-051-815508; FAX 39-051-812069. Internet - www.biofox.com

- **Bio-Fungus and Supresivit** utilize Trichoderma spp. It is intended for Sclerotinia, Phytophthora, Rhizoctonia solani, Pythium spp., Fusarium, and Verticillium diseases of flowers, strawberries, trees, and vegetables. It is applied after fumigation; incorporated in soil; sprayed or injected. Manufacturer/Distributor: BioPlant, Helsingforsgade 27B, DK-8200, Arhus N, Denmark, 45 8678 6988, FAX 45 8678 6922. Internet - www.bioplan.dk, and De Ceuster, Meststoffen N.V. or DCM, Forstseesteengweg, 30, B-2860 St.-Katelijne-Waver, Belgium; Phone 32 15-31-22-57; Distributor: BioVest, In. Office): 551 5th Ave. Suite 1100, New York, NY 10175; Office) 972-3-5179351; (Factory) 972-7-6206615: (U.S. Works, Ltd., P.O. Box 60, Beer Sheva, Israel; Phone (Main Office): 551 5th Ave. Suite 1100, New York, NY 10175; Phone 1-212-661-9800; Distributor: BiocVest, Inc. Leamington, ON. Email - daye@on.albn.com

- **Companion** utilizes Bacillus subtilis GB03, other B. subtilis, B. licheniformis, and B. megaterium. It is intended for Rhizoctonia, Pythium, Fusarium, and Phytophthora diseases of Greenhouse and nursery crops and is applied as a drench at time of seeding and transplanting or as a spray for turf. Manufacturer/Distributor: Growth Products, PO Box 1259, Westmoreland Ave., White Plains, NY 10602 USA; Phone 1-800-648-7626. Internet - www.growthproducts.com

- **Deny** utilizes Burkholderia cepacia, type Wisconsin. It is intended for Rhizoctonia, Pythium, and Fusarium diseases, and disease caused by lesion, spiral, lance, and stunt nematodes of alfalfa, barley, beans, clover, cotton, peas, grain sorghum, vegetable crops, and wheat. It is applied as a planter box treatment, in drip irrigation or as a seedling drench. Manufacturer/Distributor: Stine Boscience Corporation, 11816 North Creek Parkway North, Bothell, WA 98011-8205, 1-800-635-6866. Internet - www.edenbio.com
Microbial Products, 6613 Haskins, Shawnee, KS 66216; Phone and FAX 1-913-268-7504. Helena Chemicals, Memphis, TN. Internet - www.helenachemical.com

• DiTera utilizes a fermentation product of Myrothecium verrucaria (killed). It is soil-applied with incorporation and intended for parasitic nematodes of cole crops, grape, ornamentals, turf, and trees. Manufacturer/ Distributor: Valent Biosciences, Inc., 1333 N. California Boulevard #600, Walnut Creek, CA 94596, USA. Phone: 800-6-VALENT. Internet - www.valent.com

• Fusaclean utilizes Fusarium oxysporum (nonpathogenic). It is intended for Fusarium oxysporum diseases of asparagus, basil, carnation, cyclamen, gerbera, and tomato. It is applied in drip to rock wool or incorporated into potting mix or in row. Manufacturer/ Distributor: Natural Plant Protection, Route d’Artix B.P. 80, 64150, Nogueres, France; Phone 33-559-84-10-45; FAX 33 559-84-89-55

• HiStick N/T utilizes Bacillus subtilis. As a seed treatment, it is intended for Fusarium, Rhizoctonia, and Aspergillus diseases of soybean, alfalfa, dry/snap beans, and peanuts. Manufacturer/ Distributor: MicroBio Group, Ltd., Unit 2 Centro, Boundary Way, Hemel Hempstead, Herts HP2, 7SU, UK; Phone 01442 399123 (Production); 014420399124 (R&D); FAX 01442-399128, US Distributor: Helena Chemicals, Memphis TN. Internet - www.helenachemical.com

• Intercept utilizes Burkholderia cepacia. It is intended for Rhizoctonia solani, Fusarium spp., and Pythium spp. diseases of maize, vegetables, and cotton. Manufacturer/ Distributor: Soil Technologies Corp., 2102 185th St., Fairfield, IA 52556, USA; Phone 1-641-472-3963. Internet - www.soiltechcorp.com

• Kodiak (several formulations) utilizes Bacillus subtilis GB03. Usually applied as a seed treatment with chemical fungicides, it is intended for cotton and legume root pathogens such as Rhizoctonia solani, Fusarium spp., Alternaria spp., and Aspergillus spp. Manufacturer/ Distributor: Gustafson, Inc., 1400 Preston Rd, Plano TX 75093 USA; Phone 1-800-248-6907 or 1-972-985-8877; FAX 1-972-985-1696. Internet - www.gustafson.com

• KONI utilizes Coniothyrium minitans. Incorporated into greenhouse growing media, it is intended for Sclerotinia sclerotiorum and S. minor diseases of cucumber, lettuce, capsicum, tomato, and ornamental flowers. Manufacturer/ Distributor: BIOVED, Ltd., Ady Endre u. 10, 2310 Szigetszentmiklos, Hungary; Phone 36-24-441-554. Email boh8457@helka.iif.hu

• Mycostop utilizes Streptomyces griseoviridis strain K61. It is intended for Fusarium spp., Alternaria brassicola, Phomopsis spp., Botrytis spp., Pythium spp., and Phytophthora spp. that cause seed, root, and stem rot, and wilt disease of field, ornamental, and vegetable crops. It is applied as a drench, spray or through irrigation system. Manufacturer/ Distributor: Kemira Agro Oy, Porkkalankatu 3, P.O. Box 330, 00101 Helsinki, Finland; Phone 358-0-13-211; FAX 358-0-694-1375. U.S. Distributor: AgBio Development Inc., 9915 Raleigh St., Westminster, CO 80031; Phone 877-268-2020, 303-469-9221; FAX 303-469-9598. Internet - www.agbio-inc.com

• Paecil (also known as Bioact) utilizes Paecilomyces lilacinus. Used as a seedling or soil drench, it is intended for various parasitic nematodes of banana, tomatoes, sugar cane, pineapple, citrus, wheat, potatoes, and others. Manufacturer/ Distributor: Biopreparaty, Czech Republic; Adresse: Nogueres, France; Phone (33) 559 84 10 45; FAX (33) 559 84 12 17. Email - biopreparaty@mbox.vol.cz

• Primastop utilizes Gliocladium catenulatum. It is intended for soilborne pathogens that cause seed, root, and stem rot, and wilt disease of ornamental, vegetable, and tree crops. It is applied as a drench, spray or through irrigation system. Manufacturer/ Distributor: Kemira Agro Oy, Porkkalankatu 3, P.O. Box 330, 00101 Helsinki, Finland; Phone 358-0-13-211; FAX 358-0-694-1375. U.S. Distributor: AgBio Development Inc., 9915 Raleigh St., Westminster, CO 80031; Phone 877-268-2020, 303-469-9221; FAX 303-469-9598. Internet - www.agbio-inc.com

• Rhizo-Plus utilizes Bacillus subtilis FZB24. It is intended for Rhizoctonia solani, Fusarium spp., Alternaria spp., Sclerotinia, Verticillium, and Streptomyces scabies diseases of potatoes, corn, vegetables, and ornamental plants. It is applied as a suspension for seed treatment, soil drench, dip, and addition to nutrient solutions. Manufacturer/ Distributor: KFZB Biotechnik GmbH, Glienicker Weg 185, D-12489 Berlin, Germany; Phone 49-30-670570; FAX 49-30 67057233. Internet - http://home.fhtw-berlin.de/~s0217925/biofzb/

• Root Pro and Root-Protato utilize Trichoderma harzianum. Mixed into growing media at seeding or transplanting, it is intended for Rhizoctonia solani, Pythium spp., Fusarium spp., and Sclerotium rolfsii diseases of flower and vegetable plants and potatoes. Manufacturer/ Distributor: Efal Agri, POB 8213, Netanya, Israel. Phone: 972-9-865-6454. Internet - www.efal.com
**Products for crown gall management**


- **SoilGard** utilizes *Gliocladium virens* GL-21. It is intended for damping-off and root rot pathogens especially *Rhizoctonia* solani and *Pythium* spp. of ornamental and food crops grown in greenhouses, nurseries, homes, and interiorscapes. It is incorporated into growing media prior to seeding. Manufacturer/Distributor: Certis, Inc., 9145 Guilford Road, Suite 175, Columbia, MD 21046 USA; Phone 1-301-604-7340; FAX 1 301-604-7015. Internet - www.certisusa.com

- **Tricco** utilizes *Trichoderma viride*. Applied to seeds, tubers, and sets or used as a drench, it is intended for *Rhizoctonia* spp., *Pythium* spp., *Fusarium* spp., rootrot, seedling rot, collar rot, red rot, damping-off, and *Fusarium* wilt of mustard, masoor, oilseeds, soybean, cotton, chilies, chickpeas, green arhar dal, tobacco, cardamon, turmeric, moong, udad, chawli, tea, coffee, rubber, ginger, tomato, sugar cane, citrus, grapes, sunflower, cereals, vegetables, and others. Manufacturer/Distributor: EcoseNSE Labs Pvt. Ltd., 54 Yogendra Bhavan, J.B. Nagar, Andheri (E), Mumbai 400 059 India; Phone 834-9136/830-0967; FAX 91 2 2 / 8 2 2 - 8 0 1 6. Internet - ecosense.mamoo@gems.vsnl.net.in

- **YieldShield** utilizes *Bacillus pumilus* GB34. This seed treatment is intended for soilborne fungal pathogens causing root diseases of soybean. Manufacturer/Distributor: Gustafson, Inc., 1400 Preston Rd, Plano TX 75093 USA; Phone 1-800-248-6907 or 1-972-985-8877; FAX 1-972-985-1696. Internet - www.gustafson.com

**Products for management of post-harvest diseases**


- **Bio-save 10LP, 110** utilizes *Pseudomonas syringae*. It is intended for *Botrytis cinerea*, *Penicillium* spp., *Mucor pyriformis*, and *Geotrichium candidum* diseases of pome fruit, citrus, cherries, and potatoes. After harvest, it is applied to fruit as drench, dip or spray. Manufacturer/Distributor: EcoScience Corp., 153 Sable Palm Dr., Longwood, FL 32779, Phone 1-407-682-8542. Internet - www.villagefarms.com/biosave/index.html

**Products with miscellaneous uses**

- **Binab** utilizes *Trichoderma harzianum* and *T. viride*. It is intended for pathogenic fungi that cause wilt, take-all, and root rot of flowers, fruit, ornamentals, turf, and vegetables, and internal decay of wood products and decay in tree wounds. It can be sprayed, mixed with potting substrate, painted on tree wounds, inserted as pellets in holes drilled in wood. Manufacturer/Distributor: Binab, Box 161, 546 22 Karlsbor, Sweden, Phone: 41 505 100 93, FAX 41-505-100-93. Email - info@binab.com

- **Rotstop** utilizes *Phlebia gigantea*. Applied as a spray or in chain saw oil, it is intended for *Heterobasidium annosum* root and butt rot of trees. Manufacturer/Distributor: Kemira Agro Oy, Porekkalankatu 3, P.O. Box 330, 00101 Helsinki, Finland; Phone 358-0-13-211; FAX 358-0 694-1375.

- **Trichopel** utilizes *Trichoderma harzianum* and *T. viride*. It is intended for *Armillaria*, *Botryosphaeria*, *Chondrosternum*, *Fusarium*, *Nectria*, *Phytophthora*, *Pythium*, and *Rhizoctonia* diseases. Manufacturer/Distributor: Agrimm Technologies, Ltd., P.O. Box 13-245, Christchurch, New Zealand; Phone 64-03-366-8671; FAX 64-03-365-1859. Email - j.hunt@agrimm.co.nz

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.