

# PLANT & PEST ADVISORY

LANDSCAPE, NURSERY & TURF EDITION \$1.50

OCTOBER 9, 2003



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## Common Injuries to Trees in the Urban Landscape

*Ann B. Gould, Ph.D., Specialist in Plant Pathology and Mark C. Vodak, Ph.D., Extension Specialist in Forestry*

Trees greatly enhance both our rural and urban environments because of their scenic, recreational, and comforting qualities. As a result, significant time, effort, and money are spent on planting and maintaining trees in the landscaping around homes, businesses, public buildings, streets, and parks. Although insect and disease problems are often unpredictable or unavoidable, many major tree injuries in the landscape are caused by people. It is important to be aware of these injuries, how to prevent them, and of methods for keeping trees healthy.

The following are some of the more common injuries and suggestions for avoiding them.

### Improper Planting

Trees can be injured if improperly handled during planting or if planted at the wrong depth. Symptoms due to improper planting may occur soon after planting or not until several years afterward. Correct handling and planting techniques help to ensure survival of newly planted trees.

- Depending on tree species, plant in the early spring or fall.
- Prepare the planting hole properly so that roots are not cramped.
- Prevent roots from drying out before planting.
- Remove plastic and burlap wrapping on balled trees whenever possible. Plastic must be removed. Alternatively, after placing the tree in the planting hole, burlap should be loosened from around the trunk and/or cut away and removed from the top part of the ball, with the remainder left in place.
- Plant the tree at the same depth that it was growing in the nursery.
- Water immediately after planting (and periodically) for two seasons to maintain a moist, but not waterlogged, soil. Ideally, trees need about 1 inch of water every 7 to 10 days.
- Support the tree with rubber-protected guy wires attached to two sturdy stakes or poles. Support wires must be removed once trees roots have become established (usually within 2 years). Guy wires that are left on trees will eventually strangle the trunk.

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- Mulch soil at the base of the tree to maintain soil moisture, control weeds, and minimize mower damage. Maintain mulching to a maximum depth of 2 to 3 inches. DO NOT pile mulch “beehive style” around the base of the tree – excessive mulch restricts aeration to the roots and keeps the trunk abnormally moist.
- Do not fertilize when planting; wait until about one year after planting.

### **Improper Pruning**

Pruning every 2 or 3 years helps to improve tree vigor and maintains an attractive, natural shape. Pruning is also done to remove dead or diseased branches, and to remove branches near utility lines and buildings. Properly pruned trees can rapidly form callous tissue to compartmentalize injured tissues. Improper pruning, however, creates excessive wounding that reduces vigor and predisposes the tree to attack by diseases and insects.

- Pruning can be done any time of the year, but pruning some trees in the spring results in excessive sap flow or “bleeding” that is considered unattractive. Check with your local cooperative extension office or nursery for the best pruning time for the species in question.
- Prune living branches as close as possible to the trunk or connecting branch, without cutting the branch collar. Make a smooth cut.
- Remove broken tops and branches soon after storm damage or other injury.
- Prune diseased branches anytime during the year, but do so only during dry weather. To prevent disease spread, cut 6 to 8 inches below the affected tissue with surface sterilized pruning tools. To sterilize tools, dip them in denatured (70%) alcohol or 10% bleach between cuts. Thoroughly wash and dry tools after use.

### **Treating Wounds**

Properly cleaned and shaped wounds help prevent tree decay. Treat wounds by removing dead and torn bark tissue, then scribe and round the edges of the wound with a sharp knife. Although wound dressings have no proven healing value, commercial asphalt-based preparations specifically for tree wounds or orange shellac can be applied to wounds as a cosmetic treatment.

### **Construction**

Trees, like people, are easily disturbed by changes in their surroundings. It may be several years, however, before obvious symptoms appear. Construction of buildings and roads is a major cause of tree injury and loss.

- Although trunk injury can kill trees, it is root injury during construction that is most likely to kill trees.
- Prevent damage to trees near construction sites by fencing or otherwise protecting them from earthmoving equipment.

- Avoid the placement of excessive soil fills or impervious materials within the drip line (the entire area under the branches) of a tree. It is even better to protect an area several feet wider than the drip line. Since fill materials can cut off oxygen to plant roots, the extent of damage to roots is directly related to depth of material applied and the length of time it is allowed to remain.
- Alternatively, lowering the grade during construction or removing soil can also destroy plant roots.
- Carefully design and construct trenching for cable and water lines to avoid or minimize root damage.

### **Soil Compaction**

Soil compaction around trees is caused by people, animals or pets, bicycles, and cars. Since compaction cuts off water and oxygen to tree roots, trees growing in such soils may decline and die. Design pedestrian and other traffic patterns to prevent soil compaction. Soils high in clay are more prone to compaction than are sandier soils.

### **Lawn and Garden Equipment and Chemicals**

- Use equipment carefully to prevent serious injury to tree trunks, branches, and roots. To prevent injuring trees accidentally with lawn mowers or weed-eaters, grass should be kept away from tree trunks. Mulches can be used for a “mower buffer.”
- Choose all pesticides wisely. Use all chemicals only in the precise manner described on the label. Remember that certain herbicides (weed killers) can kill trees, and many herbicides that are safe for grasses are not safe to use around trees. Check the pesticide label before applying any herbicide.
- Recently transplanted trees are especially susceptible to herbicide injury. Avoid excessive use of commercial fertilizer-herbicide mixtures near trees. □

# Plant Diagnostic Laboratory Highlights

Richard J. Buckley, Laboratory Coordinator

## Turf

In the four weeks since the last newsletter, except for an unexpected surge in **gray leaf spot** samples, things on the turfgrass front continue to slow. Historically, submissions of **gray leaf spot** to our laboratory peak on September 14, which proved to be the case again this year. In golf turf, the samples were submitted from courses in northern-Delaware, West Chester County, New York, and from Union, Ocean, and Sussex Counties in New Jersey. The ryegrass in several trials on the Rutgers research farms in North Brunswick and Adelphia was also hammered. Of course, there are many of us around here that are happy about that because it increases our understanding of the disease. The most interesting case, however, was a home lawn in Mercer County. This gentleman had a bluegrass lawn that he slowly transformed to rye as he repaired the damage from his Irish setter with a homemade "divot mix". The fungus that causes gray leaf spot, *Pyricularia grisea*, succeeded in killing every blade of rye on the site. Our suggestion was to renovate back to a Kentucky bluegrass turf (and keep the dog off). Mid-September also brought a couple lingering samples of **brown patch** from residential lawns and **summer patch** from golf turf. We also recently had a sample of **Pythium seedling blight** from a new golf course grow-in. *Pythium* is normally associated with summer heat, but can also be problematic in the cooler weather for seedlings. It would be prudent under the circumstances to use fungicide treated seed. Last but not least, can't forget to mention the obligatory **anthracnose** samples! We had **anthracnose** from Cape May and Mercer Counties, and from golf turf in New York and Connecticut.

## Landscape

Samples of woody ornamentals from the landscape and nursery continue to be submitted to the laboratory with a myriad of leaf diseases and minor stem blights. Samples include: **anthracnose** on oak, maple, and birch (*Discula betulina*); **Phyllosticta leaf spot** on maple, cotoneaster, and English Ivy; *Pestalotiopsis* on arborvitae; *Kabatina* on juniper; *Blumeriella jaapii* on *Prunus*; *Cristulariella depraedens* on sugar maple; and a couple **cedar-apple rusts**. **Phytophthora crown and root rot** continues to be a problem for container nurseries. Samples diagnosed with the disease include forsythia, rhododendron, cotoneaster, and azalea. □

# Glyphosate-Containing Herbicide Products

Stephen Hart, Ph.D., Specialist in Weed Science

Until recently, glyphosate was primarily marketed in the turf and ornamental industry by Monsanto under the Brand name "Roundup." In the 1990's, Monsanto reformulated glyphosate, and marketed "Roundup Pro," which contained a proprietary adjuvant system that did not require the addition of non-ionic surfactant. Currently, Monsanto markets both liquid and dry formulations of "Roundup Pro" as well as "Roundup Original" which does not contain a built-in adjuvant system.

Starting in the late 1990's additional companies started to market glyphosate-containing herbicide products. While increased competition can bring economic benefits to the turf and ornamental industry, there was a great deal of concern that these products would be formulated differently (in terms of adjuvant system and amount of active ingredient) than the "Roundup" Brand of products, leading to confusion in terms of product use rates and addition of non-ionic surfactant. Fortunately, although the brand names differ, these products are very similar to the "Roundup Pro" and "Roundup Original" formulations. Albaugh offers "Gly Star Pro" and "Gly Star Original," Cheminova offers "Glyfos Pro" and "Glyfos," Dow AgroSciences offers "Glypro Plus," Lesco offers "Prosecutor Pro" and "Prosecutor," and Riverdale offers "Razor Pro" and "Razor." In all cases, these products contain the same active ingredient (41% glyphosate) as the "Roundup" Brand of products so that product use rates are equivalent. The brand name with a Pro or Plus attached indicates that the product contains a built-in adjuvant system similar to "Roundup Pro."

The notable exception to this similarity in products is "Touchdown Pro," marketed by Syngenta. "Touchdown Pro" has a different salt formulation and adjuvant system than other glyphosate formulations and the addition of non-ionic surfactant is recommended at spray volumes of 30 gallons per acre (GPA) or more. □

# Basics of IPM: A Review of Some Biorational Insecticides

Steven K. Rettke, Ornamental IPM Program Associate

**B**iorational" insecticides are insect controls that have lower risks to humans, wildlife, and the environment than do the conventional pesticides. Since the IPM philosophy encourages the use of biorational control materials, it is important to have a good understanding of their strengths and limitations in order to achieve successful pest management when they are applied.

**Horticultural oils and insecticidal soaps** are not discussed here because they are generally well understood by most landscapers. The following are some biorational products that typically are less commonly used.

**Bacillus thuringiensis (Bt):** *Bacillus thuringiensis* is a common soil bacterium that was initially discovered in Japan. Different strains of this bacterium have been identified to be toxic to different insects. Bt has been used most widely against caterpillar pests, but other strains are also effective against leaf feeding beetles, flies and mosquitoes. More recently, a strain has been discovered that is active against certain root feeding white grubs.

The Bt bacterium kills insects when they are consumed. The bacteria contain insecticidal proteins that are in the form of crystals. When eaten by an insect, the crystal dissolves in the insect's stomach and breaks down the stomach wall, causing rapid paralysis of the gut. As the gut wall deteriorates, the insect stops feeding and death occurs within several days, usually by starvation. Bt insecticides are most effective against young, immature insect larvae. With caterpillar pests the 1<sup>st</sup>, 2<sup>nd</sup> and possibly 3<sup>rd</sup> juvenile stages (instars) are most susceptible to toxic crystal. Older larvae (4<sup>th</sup>, 5<sup>th</sup>, or 6<sup>th</sup> instar stages) are much less vulnerable to Bt.

The toxic crystal can only dissolve in those insect species whose stomachs contain the correct combination of pH, salts, and enzymes. Therefore, because of this selectivity, it cannot dissolve in the highly acidic stomachs of humans or cause direct harm to birds, fish or other wildlife. The keys to success when using Bt are: (1)-treat when the larvae are small, (2)-get good coverage to the foliage, & (3)-select the correct strain of Bt against the pest needing control.

**Spinosad (Conserve):** The bacterium *Saccharopolyspora spinosa* is a naturally occurring microorganism that produces a new class of insecticides called Naturalytes. Two fermentation-derived toxic substances are released by this bacterium. Spinosad controls caterpillars, leaf beetles and sawflies as a

contact insecticide as well as if ingested. It has a much broader host range than the Bt insecticides. For example, it will control sawflies, but Bt will not). Additionally, it has the ability to suppress older, more mature larvae. For instance, Bt is only effective against 1<sup>st</sup> through 3<sup>rd</sup> stage (instar) caterpillars, while Spinosad can be effective against all stages of larvae.

Spinosad affects the insect's nervous system by disrupting the nerve receptor sites. It is active at very low use rates, has a relatively short residual, is mild on beneficial insects and has very low toxicity to humans and wildlife. Other spinosad-derived insecticides will undoubtedly be developed in the near future for both turf and ornamentals.

**Halofenozide (MACH 2):** Halofenozide was the first insecticide labeled for turf with a mode of action that works as an insect growth regulator (IGR). In a manner similar to the Neem products, halofenozide mimics the insect molting hormone. More specifically, this IGR insecticide causes grubs and caterpillars to attempt a premature, lethal molt. The ingestion of only a very small amount of halofenozide will kill target pests by this disruption of their normal molting process. It has a residual of 6 weeks or longer in the soil. However, unlike the product imidacloprid (Merit), it can act fast enough to act as a curative as well as a preventative.

When using halofenozide, being able to identify specific white grub species is important. This product has provided excellent control of Japanese beetle and masked chafer grubs, but has shown less effective controls against European chafer, Oriental beetle and other grub species.

**Abamectin (Avid):** The *Streptomyces* bacteria produce a highly toxic by-product that is effective against mites and leafminers. This toxin can be produced from the fermentation of this bacterium. It should be remembered that bacteria are living organisms that have evolved and flourished by producing defensive chemicals that will suppress their competition and increase their own chances for survival. Spider mite controls can be excellent. However, the potential for resistance problems has occurred. Also, abamectin can be harsh on beneficials.

Abamectin is a foliar absorbed material with a moderate residual of 7 to 10 days. It also has a label for micro-injection (Inject-A-Cide AV). This bacterial toxin may cause eye damage to the applicator if accidentally exposed.

**Neem Insecticide (Azatin, BioNeem, Turplex):** The active ingredient, azadirachtin, is extracted from seeds of the Neem tree that grows in India and Burma. When Neem comes in contact or is ingested by susceptible insects, it acts as an insect growth regulator (IGR) by interfering with molting. This disruption of the molting process usually causes death a few days after exposure.

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Azadirachtin also has systemic abilities and can act as a feeding deterrent as well as a repellent against certain insects. Neem has low toxicity to humans, pets, or wildlife and is labeled for aphids, caterpillars, elm leaf beetles, leafhoppers, sawflies, thrips, and leafminers. Since Neem insecticides work best as an IGR, the key to success is to monitor the pest and time the application when the larvae are small and actively growing. This material has a slow kill rate that may require repeat applications.

**Beauveria bassiana:** A naturally occurring fungus that under the proper conditions can be an effective insecticide. Billbugs, white grubs, and especially chinchbugs are susceptible to the killing effects from this fungus infection, as well as greenhouse pests, mites and lacebugs.

Insects die when *Beauveria* spores attach to the cuticle and germinate. They then penetrate through the body wall. A mass of white, cottony fungus later sporulates on the surface of the infected insect. During cool and wet weather conditions, this fungus can naturally cause the collapse of chinch bug populations. These products may have more practical use against greenhouse pests since multiple applications are usually required. Also, this fungus insecticide requires high humidity to enhance efficacy. The kill rate of *Beauveria* is slow, and

the residual is short (less than one week). Products are sold as a liquid concentrate. Store in a cool location or in the refrigerator prior to use.

**Hexythiazox (Hexygon):** Hexygon is a miticide labeled only for Tetranychid mites (two-spotted spider mites, European red mites). It controls both deposited mite eggs and any eggs laid after application, as well as stopping immature mite development. Therefore, it could technically be called a mite growth regulator. It does not kill adult mites, but does sterilize adult females (prevents their eggs from hatching).

Timing and coverage are important when using Hexygon. In an IPM program, apply after the first sign of mites or before mite populations build. It has a long residual (up to several weeks). Hexygon can also be tank mixed with a contact miticide for adult mite control.

**Cinnamaldehyde (Cinnacure, Cinnamite):** Cinnamaldehyde is a miticide, as well as an insecticide and a fungicide. It is labeled for control of all species and all lifestages of mites (including mite eggs), as well as for aphids, powdery mildew, and algae control. Cinnamite is a derivative of cinnamon oil (cinnamaldehyde) that works upon direct contact of pests. Death of target pest begins immediately and control is within 24 hours. There is little residual action. It has a pleasant cinnamon fragrance after application. □

## Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Weather Summary for the Week Ending 8 am Monday 10/ 6/ 3											
WEATHER STATIONS	R A I N F A L L			TEMPERATURE				GDD BASE50		MON %FC	
	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP		
BELVIDERE BRIDGE	.20	42.50	13.37	66	34	49.	-7	2869	220	91	
CANOE BROOK	MISSING										
CHARLOTTEBURG	.12	43.48	12.47	67	26	46.	-8	2305	203	96	
FLEMINGTON	.13	38.95	9.74	65	32	48.	-9	2812	79	96	
LONG VALLEY	.30	40.23	8.61	62	30	47.	-8	2256	-73	99	
NEWTON	.17	39.93	11.48	66	30	47.	-7	2591	233	96	
FREEHOLD	.06	30.79	2.42	69	31	51.	-8	3051	128	93	
LONG BRANCH	.05	33.34	4.63	69	35	52.	-7	2882	13	86	
NEW BRUNSWICK	.05	36.13	7.30	69	34	51.	-8	3014	-40	94	
TOMS RIVER	.03	35.19	5.77	70	32	53.	-5	3073	208	82	
TRENTON	.07	30.42	3.18	66	34	51.	-9	2987	-194	87	
CAPE MAY COURT HOUSE	.00	27.41	1.92	66	33	53.	-9	2987	42	52	
DOWNSTOWN	.00	31.45	4.79	66	34	52.	-9	3121	-85	71	
GLASSBORO	.00	32.77	4.66	68	35	52.	-8	3315	152	74	
HAMMONTON	.01	27.08	-.97	69	34	53.	-7	3271	103	56	
POMONA	.03	25.29	.02	69	32	52.	-7	3105	162	71	
SEABROOK	.00	32.98	7.21	67	36	53.	-8	3388	161	65	
ATLANTIC CITY MARINA	missing										
SOUTH HARRISON	.01	30.01	2.52	67	36	54	NA	3282	NA	NA	
WES KLINE — GDD BASE 40 PINEY HOLLOW	Last Week		192	(Ending 9/29/03)			This Week		84	(Ending 10/6/03)	

## Calendar of Events

**October 20, 2003** - Greenhouse Management: Cost Accounting and Crop Production Workshop, 8:30 am - 4:00 pm, Cook College Campus, New Brunswick, NJ. Cost: \$15 (includes lunch, handouts; the cost accounting software will be provided for free). Contact Keith Wilson at 732-932-9271 ext. 617 or via e-mail at [kwilson@aesop.rutgers.edu](mailto:kwilson@aesop.rutgers.edu).

**November 1, 2003** - If Plants Could Talk at 12:30 PM on NJN Public Television. Gardeners in New Jersey often ask themselves, "How can I maintain a lush garden, and keep out the local wildlife?" Rutgers Cooperative Extension will present some answers on the next episode. We'll talk with the experts about techniques to exclude critters from garden beds, and learn of some plants proven to be distasteful to hungry deer. Visit our website at: [www.ifplantscouldtalk.rutgers.edu](http://www.ifplantscouldtalk.rutgers.edu).

**December 4, 2004** - South Jersey Landscape Conference and Trade Show, Masso's Crystal Manor, 210 S. Delsea Drive, Glassboro, NJ. Contact: Jerry Frecon at Rutgers Cooperative Extension of Gloucester County at 856-307-6450 - Ext 1 or Carl Nordstrom - New Jersey Nursery & Landscape Association at 609-291-7070 or visit <http://gloucester.rce.rutgers.edu/>.

**December 9 - 11, 2003** - Turfgrass Expo, Trump Taj Mahal, Atlantic City, NJ. Contact Bea Devine at 732-821-7134.

## South Jersey Landscape Conference and Trade Show

**Thursday, December 4, 2003**

**8:30 am - 4:30 pm**

**Masso's Crystal Manor**

**210 S. Delsea Drive, Clayton, NJ (Gloucester County)**

- 8:15 a.m. Registration and Refreshments  
9:00 a.m. Welcome and Remarks, New Jersey Nursery and Landscape Assn. - Dallas Herold, 2003 NJNLA President, Herold's Landscaping & Garden Center, Flanders  
Moderator - Carl Nordstrom, Executive Director, NJNLA  
9:15 a.m. New Ideas and Practices to Improve Your Landscape Business - Panel discussion by New Jersey's Leading Landscape Contractors  
Panel Moderator - Jerome L. Frecon, Rutgers Cooperative Extension of Gloucester County.  
Peter F. Haran, Lipinski Landscape and Irrigation Contractors, Marlton  
Steve Stolzor, TJ's Lawns and Landscapes, Woodstown  
Ruth Tevis, Dare Living Associates, Inc., Franklinville  
Other Landscape Contractors, TBD  
10:15 a.m. New Introductions and Old Favorites of Plant Materials in the Landscape - Pat Cullina, Rutgers Gardens, New Brunswick.  
11:00 a.m. Break  
11:20 a.m. New Products and Marketing of Hardscaping - Paul Cimini-EP Henry, Woodbury  
12:30 p.m. Lunch in Exhibit Area  
Moderator - Russ Blair, Rutgers Cooperative Extension of Cape May County.  
1:30 p.m. Proper Use of Lighting in the Landscape - Jim Dobrzynski-Shemin Nurseries, Mahwah.  
2:15 p.m. What Growers Never Tell You about Selecting Trees- Larry Kuser, Fernbrook Nursery, Bordentown  
3:00 p.m. Wood Borers - The Ultimate Landscape Assassins- Steve Retke, Rutgers Cooperative Extension of Camden County  
3:30 p.m. Impact of Moisture on Disease Development Dr. Ann Gould, Specialist in Ornamental Plant Pathology Rutgers Cooperative Extension.  
4:00 p.m. Update on Landscape Contractor's Pesticide Safety Program - Pat Hastings, Pest Management Program Associate, Rutgers Cooperative Extension  
4:30 p.m. Adjourn  
N. J. Pesticide Applicator Units = 2 Units of Forest 2; 2 units of 3A Ornamentals; 2 Units of 6B Right of Way; 2 Units of 8C Campground; 1 Unit of Core Basic Safety & Handling; 2 Units PP2 Private Applicator Category  
Certified Nursery and Landscape Professional Credits = 1 each on insects, soils and disease, and 2 of management  
For program information call: Jerry Frecon at Rutgers Cooperative Extension of Gloucester County at 856-307-6450 - Ext 1 or Carl Nordstrom - New Jersey Nursery & Landscape Association at 609-291-7070 or visit <http://gloucester.rce.rutgers.edu>. □

# Diseases of Turfgrass

Bruce B. Clarke, Ph.D., Specialist in Turfgrass Pathology

## General

**Anthracnose, rust, dollar spot, and stripe smut** are active at this time. Although **gray leaf spot** is still apparent on perennial ryegrass in some locations, no fungicide sprays are required this late in the season. Refer to recent issues of this newsletter for additional information about the identification and management of these diseases.

## Pink Snow Mold

This disease, caused by the fungus *Microdochium nivale* (*Fusarium nivale*), should develop soon on golf and landscape turf. To prevent pink snow mold this fall, avoid excessive nitrogen applications, continue mowing turf until dormancy, and apply Banner, Chipco 26GT, chlorothalonil, Compass, ConSyst, Eagle, Heritage, Medallion, PCNB, Spectro, thiophanate-methyl or vinclozolin. For best results, apply any of these fungicides now and then repeat in late-January if the snow cover recedes. Do not, however, reapply PCNB after January 15 due to the possibility of phytotoxicity during warm weather next spring.

## Stem and Crown Rust

These diseases are prevalent on susceptible Kentucky bluegrass and perennial ryegrass cultivars, respectively, at this time. As rust intensifies, affected turf prematurely yellows and orange pustules called uredia (reproductive structures) appear on leaf blades. To control both stem and crown rust, maintain adequate fertility and soil moisture, and apply Banner, Bayleton, chlorothalonil, Compass, Eagle, Heritage or mancozeb per manufacturer's recommendations.

## Stripe Smut

This disease, caused by the fungus *Ustilago striiformis*, is apparent on sensitive Kentucky bluegrass varieties. Symptoms appear as long black streaks (striations) between the veins of infected blades. These areas eventually rupture releasing abundant black smut spores. One well-timed application of an appropriate fungicide in mid-October will provide excellent control and is, therefore, far superior to multiple applications in the spring (mid-May). For best results, apply Banner, Bayleton, Cleary 3336, Eagle, Fungo, or Rubigan now per manufacturer's recommendations.

## Take-all patch

This disease, caused by the root and crown infecting fungus, *Gaeumannomyces graminis* var. *avenae*, can appear on bentgrass greens, tees and fairways at any time in the fall and spring. Although take-all patch is difficult to control, best results have been achieved through the use of acidifying fertilizers during cool weather (e.g.,

ammonium sulfate) and preventive applications of Banner, Bayleton, Heritage, or Rubigan in October and November. If the disease has been particularly severe, fungicides should be reapplied twice next spring at 21 to 28-day intervals beginning in early April. Chemicals should be applied in 4 gal water/1000 sq ft or irrigated into the root zone (1/8 to 1/4" of water) for maximum effectiveness. Whenever practical, overseed infested areas with less susceptible grasses such as fine fescue, Kentucky bluegrass, or perennial ryegrass to mask symptom expression. Maintain soil pH at approximately 6.0 since the disease is enhanced in alkaline soils.

## Turf Expo

This year's Turf Expo will be held at the Trump Taj Mahal Casino/Resort on December 9-11, 2003. This is an excellent opportunity to receive the latest turf management information from nationally renowned speakers. For additional information, please contact Dick Caton (856) 853-5973 or Bea Devine (732) 821-7134. □

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