Disease management in landscape ornamentals

Plant health and quality take forethought and time but is a necessary step in the protection of our investment in the landscape.

By JOHN WATKINS, Ph.D./University of Nebraska

Landscape ornamentals represent a considerable investment to a property owner. It's much less costly to prevent disease injury to landscape plants than it is to replace them.

Plant selection

Do your homework before purchasing landscape plants. Become knowledgeable in the basics of plant disease i.e. how diseases develop, the common landscape plant diseases in your geographic area, how environmental stress interacts with the host and potential disease threats and the control measures available for combating the various diseases.

Plant selection encompasses two aspects of disease management. One, know your plant material. When plants, not well adapted to a geographic area, are exposed to an inhospitable environment, stress results. Chronic stress in a landscape plant often predisposes it to infection by disease-causing bacteria or fungi. Many of these organisms are opportunists that have difficulty infecting healthy, vigorously growing plants but can become deadly invaders of stressed plants. If a certain tree or shrub is not adapted to your geographic area, don't put it in the landscape.

In my geographic area of the Great Plains, iron chlorosis is a chronic problem in certain landscape sites and plants because, in our high pH soils, iron is less available. Pin oak, a popular landscape tree, suffers because of iron deficiency. It's difficult to modify the soil with enough organic matter or sulfur to lower the pH and drilling holes in the trunks of chlorotic trees to inject iron is unsightly and may promote internal decay of the heartwood. You can avoid the hassle, expense and problem by simply not planting pin oaks in high pH soils.

Another example of a problem landscape tree in certain geographic areas is sycamore. Sycamore is a beautiful tree but anthracnose is a chronic disease that may greatly detract from the tree's value as a landscape plant. Before you plant sycamore give some thought as to developing a tree health management plan.

Roses and flowering crabapples are popular landscape ornamentals in both residential and commercial landscapes. When the homeowner or landscape manager selects a variety based only on aesthetics the headaches begin. Black spot and powdery mildew can devastate a rose garden and apple scab, fireblight or cedar apple rust can make your flowering crabapple or hawthorn look far different from that picture in the garden seed or landscape catalog. When you plant a disease susceptible variety, you lock yourself into an expensive and time consuming fungicide spray program just to maintain the health and aesthetic value of that plant.

With many of our landscape ornamentals, disease-resistant varieties are available, and by choosing one of these both you and your plant will be much happier.

Correct diagnosis

Correct diagnosis is basic to maintaining plant health, but recognizing an infectious disease on ornamentals can sometimes be difficult. With certain diseases such as tar spot of maple or rust on quaking aspen, symptoms are specific, but with others, such as ash anthracnose, they may be nonspecific. Sometimes non-specific symptoms of an infectious disease resemble those of environmental stress making a determination more difficult.

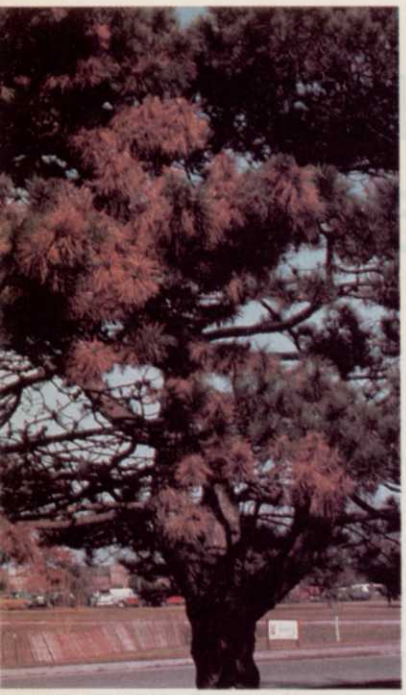
Powdery mildew on rose

Cultural practices

▶ **Fertilization**—Don't promote lush growth with heavy applications of nitrogen. Develop a balanced fertility program.

▶ **Irrigation**—Provide adequate water for your plants but don't overwater. Avoid overhead irrigation. For trees irrigate at the drip line.

▶ **Location** —Don't crown



Pine tip blight on Austrian pine

plants. Provide winter and summer protection for sensitive ornamentals.

▶ **Pruning**—Make pruning cuts in healthy tissue well below infected areas. Preferably, prune when the tree or shrub is dormant.

▶ **Mulch**—Mulching around trees and shrubs protects the plants from mower injury and maintains a moist soil environment. Pull mulch away from the base of tree trunks.

▶ **Insect and Weed Control**—Weeds may harbor viruses that can be transmitted by insects to ornamentals in flower beds.

▶ **Removal**—Remove diseased flowers from the ornamental bed when symptoms are first noticed.

Chemical Control

Careful plant selection and good cultural practices can reduce the dependency on chemicals for disease control. However, when incorporated into a holistic plant health management program, rather than a "spray and pray" approach, fungicides provide the landscape manager with an effective disease control tool. Correct diagnosis of the disease leads to selection of the right chemical. Apply the chemical so that all plant surfaces are covered. If the foliage being sprayed is hairy, you may need to add a spreader-sticker to the spray mix. Timing is critical, not only for the initial application but for follow-up repeat applications as well. Weather, plant growth and other factors affect residual activity of the chemical. Labels will give repeat application guidelines. **LM**

SOME CHEMICALS FOR DISEASE MANAGEMENT IN LANDSCAPE ORNAMENTALS

Bordeaux mixture, fixed copper
Dormant application for anthracnose, general protectant for certain leaf spots and blights

Fosetyl-Al (Aliette WDG)
Phytophthora root rots

Chlorothalonil (Daconil Ultrex)
Broad spectrum protectant for anthracnose, leaf and petal blights and needle casts

Quintozene (Terrachlor, PCNB)
Root and stem rots

Triforine (Funginex)
Rose black spot, powdery mildews, rusts

Iprodione (Chipco 26019)
Botrytis blight, Rhizoctonia leaf and stem diseases

Triadimefon (Bayleton)
Rusts, mildews and certain leaf spots and blights

Maneb/Mancozeb
General protectant for rust and leaf spots

Propiconazole (Banner MAXX)
Apple scab, powdery mildew, leaf spots and blights on certain ornamentals

Thiophanate-methyl (Cleary's 3336)
Rhizoctonia root and stem diseases, certain leaf spots and blights, Botrytis blight

Agrobacterium radiobacter (Galtrol)
Biological control for crown gall

Fenarimol (Rubigan)
Powdery mildew, apple scab, rusts and black spot

Sulfur
Organic fungicide for powdery mildew

Streptomycin (Agri-Strep)
Control of bacterial diseases such as fireblight

Propamocarb (Banol)
Soil drench for Phytophthora and Pythium root rots

Metalxyl (Subdue MAXX)
Soil drench for Phytophthora and Pythium root rots

Chloroneb (Terraneb SP)
Soil drench for Pythium, Rhizoctonia and other root and blight diseases

Myclobutanil (Eagle)
Systemic fungicide for rusts and powdery mildews

Presented for informational purposes only. No endorsement is implied for products listed, nor criticism for products not listed. Check with local specialists for specific recommendations or contact manufacturer. Read and follow label instructions.

SYMPTOMS OF DISEASES OF LANDSCAPE ORNAMENTALS

Disease	*General Symptom*
Fungus leaf spots	Distinct spots that vary in size, shape & color
Bacterial leaf spots	Water-soaked spots that drop out
Anthracnose	Leaf spots and blotches and twig dieback
Cankers	Discolored branches, open wounds or branch dieback
Wilts	Yellowing and dieback of foliage, dark streaks in vascular tissue
Rusts	Yellow to orange pustules on leaves and twigs
Mildew	Grayish white powdery coating on leaves, distorted plant parts
Galls	Tumor-like growths on plant parts
Root rots	Wilting and dying of plants, discolored roots
Fireblight	Scorched appearance of shoots, blossonms and/or fruit
Scabs	Black to dark green circular lesions on leaves and fruits
Blights	Non-specific dying of leaf and flower tissue
Mosaic viruses	Mosaic pattern of lightgreen, dark green and yellow on leaves

DISEASE MANAGEMENT

in cool-season turfgrass

The goal of every turfgrass manager should be to create a healthy turfgrass ecosystem. This can be a challenge since growing seasons in the northern latitudes are never the same.

By JOHN E. WATKINS/
Ph.D. University of Nebraska

Anyone that has ever taken a soil microbiology course comes away with a new appreciation of the abundance of microbes in the plant/soil rhizosphere.

The rhizosphere is that microenvironment in soil influenced by plant roots. One pound of soil and roots may contain over 900 billion organisms--bacteria, fungi, actinomycetes, nematodes, insects, etc. With that many organisms within the root zone of your turfgrass plants, you often wonder how anything survives. Fortunately for the turfgrass manager, only a few of the microbes in the rhizosphere cause disease; many benefit plant growth by keeping disease-causing microbes under control. There's a delicate coexistence between the good and the bad microbes in the turfgrass rhizosphere. When this balance is altered, disease can result.

Turfgrass diseases result from the complex interaction of pathogen, host and environment. Turfgrass management practices can affect all three, greatly influencing disease development. Those practices that favor vigorous, but not lush, grass growth and are detrimental to growth of the pathogen result in less disease injury to the turf. Good turfgrass management is an effective disease deterrent.

The goal of every turfgrass manager should be to create a healthy turfgrass ecosystem. This is a challenge since growing seasons in the northern latitudes are never the same. In 1996 the Northern Plains were relatively cool and wet. 1997, however, was just the opposite—hot, dry and windy. Because each season is different and because the relationship of host, pathogen and environment are so ecologically interwoven, disease predictions are difficult.

Let's examine some of the more common and damaging diseases of cool-season turfgrasses.

Leaf spot and melting out are two fungal diseases within the old group known as "Helminthosporium" leaf, crown and root diseases. The leaf spot pathogen, *Bipolaris sorokiniana*, attacks bluegrasses, bentgrasses, ryegrasses and fescues. Melting out, caused by *Drechslera poae* is a serious disease of Kentucky bluegrass and also occurs on ryegrasses and fescues. Both diseases are favored by dry periods alternating with prolonged cloudy wet weather. The range of pathogen activity is from 65°F to 85°F. Early disease symptoms are small dark brown spots on the leaf blade or leaf sheath. As the diseases progresses, the spots enlarge causing the infected leaves to yellow and the affected turf to appear chlorotic and thin.

Dollar spot injury to ryegrass is most prevalent when days are warm, nights are cool.

Widespread use of improved turfgrass cultivars with good resistance to leaf spot and melting out has significantly lessened the impact of these diseases on turfgrass quality. The dependency on rescue fungicide treatments can be drastically reduced through good cultural practices. These include a fertilization program that does not stimulate lush growth in May, thatch management and using a preventive fungicide program on susceptible turfs.

Dollar spot, caused by *Sclerotinia homeocarpa*, occurs when days are warm and nights are cool. The presence of dew and high humidity in the turf canopy are ideal conditions for dollar spot. On turfs maintained at 1 to 3 inches, symptoms are a mottled, light tan pattern made up of 4- to 6-inch patches of blighted turf. Individual leaf blades will develop a lesion that may be up to an inch long, is light tan with reddish-brown margins and often spans the width of the blade. If the turf looks as though it's covered with small cobwebs in the mornings, that's probably *S. homeocarpa* mycelium.

Dollar spot often can be prevented without the use of fungicides or with minimal fungicide application. Maintaining vigorous growth during the season helps the turf outgrow the infection and recover quickly when it is infected. If needed, a fungicide can be applied at the first appearance of dollar spot.

Two of the most destructive patch diseases of cool season turfs are **necrotic ring**

spot, caused by *Leptospheria korrae* and **summer patch**, caused by *Magnaporthe poae*. Necrotic ring spot generally occurs on Kentucky bluegrass during spring and fall, and summer patch during July and August. Summer patch devastated lawns in the central plains in 1997 because of record high temperatures and low rainfall. Distinguishing between the two diseases is difficult as both produce doughnut-like patches in affected turf. The dead grass is light tan and matted, and many of the patches will have a tuft of healthy grass in the center.

The key to effective management of these two persistent diseases is in promoting root health through timely fungicide treatment and minimizing stress during the hot periods of the summer. These diseases are like a bad headache. They go away periodically but always return during periods of stress. On established turf, the key to prevention is to avoid management practices that promote rapid top growth at the expense of root development. Reduce thatch, fertilize properly and water more frequently when the disease is active. Apply a systemic fungicide with high volumes of water to drench the chemical into the root zone. Make the first application in May with a second one in June.

Summer patch in Kentucky bluegrass

Brown patch, caused by *Rhizoctonia solani*, occurs on Kentucky bluegrass, tall fescue and perennial ryegrass during midsummer's heat and humidity. The disease is identified by the presence of patches of dead and dying grass. The

PREVENTIVE AND CURATIVE FUNGICIDE PROGRAMS FOR MAJOR DISEASES OF COOL-SEASON TURFGRASSES

Disease	Preventive/ Curative	Initial application	Products
Leaf spot/melting out	P	May	chlorothalonil, iprodione, mancozeb, propiconazole, vinclozolin
Stripe smut	P	April or October	cyproconazole, fenarimol, flutolanil, propiconazole, thiophanate-methyl, triadimefon
Necrotic ring spot	P	When soil temperatures reach 60F at 2" depth	azoxystrobin, cyproconazole, fenarimol, iprodione, thiophanate-methyl
Fairy ring	C	At first symptoms of green ring	flutolanil
Dollar spot	P/C	June for ryegrass and bentgrass	chlorothalonil, cyproconazole, iprodione, mancozeb, propiconazole, thiophanate-methyl, triadimefon, vinclozolin
Brown patch	P/C	June for ryegrass and bentgrass	azoxystrobin, chlorothalonil, cyproconazole, flutolanil, iprodione, propiconazole, thiophanate-methyl, triadimefon, vinclozolin
Summer patch	P	When soil temperatures reach 65°F at 2" depth	azoxystrobin, cyproconazole, fenarimol, propiconazole, thiophanate-methyl, triadimefon
Pythium blight	P	June	azoxystrobin, chloroneb, ethazol, fosetyl-Al, metalaxyl, propamocarb
Rust	P/C	July	chlorothalonil, cyprocanazole, mancozeb, propiconazole, triadimefon
Typhula blight	P	October/November	chlorothalonil, cyproconazole, fenarimol, flutolanil, iprodione, PCNB, propiconazole, triadimefon, vinclozolin
Microdochium patch	P	October/November	azoxystrobin, chlorothalonil, cyproconazole, fenarimol, iprodione, PCNB, propiconazole, thiophanate-methyl, triadimefon, vinclozolin

This list is presented for information only and no endorsement is intended for products listed nor criticism meant for products not listed. Check with local specialists for specific recommendations and read and follow label instructions.

patches are roughly circular. Green plants within the diseased patches have leaf spots that are long, gray lesions surrounded by a dark brown margin.

The presence of dew and high humidity in the turf canopy are ideal conditions for dollar spot.

Control thatch and maintain an adequate nitrogen fertility program during the growing season. Don't overdo it with the nitrogen, but don't starve the turf either. Apply a fungicide to susceptible turfs at the first appearance of brown patch symptoms.

Pythium blight is caused by several species of *Pythium* fungi. In turfgrass they survive in thatch and soil. All turfgrass species are susceptible to attack by these fungi. The two most important criteria for disease occurrence are poor surface drainage and a wet grass canopy. These along with high relative humidity and day temperatures above 90°F with warm nights, provide an ideal environment for an outbreak. Environmental conditions are key to this disease. When it's cool and dry, no disease, but when it's hot and humid, look out. Early symptoms are small brownish spots that suddenly appear, especially in drainage channels, within the turf. These many form into larger areas where the individual spots have merged. Infected leaves appear water-soaked and feel slimy to the touch. In the early morning hours, the turf may contain masses of fungal mycelium resembling a fluffy cotton ball. Sometimes the affected turf will give off a fishy odor. Place a plug of the affected turf in a sealed plastic bag overnight and then smell the results.

Melting out of Kentucky bluegrass

No single control measure will provide complete protection against an outbreak of Pythium blight. Turf managers must employ a combination of good management, early disease detection, and preventive fungicide treatment to avoid serious turf injury. Provide good surface and subsurface drainage and promote good air movement across blight-prone areas by pruning landscape plantings. The best fungicide strategy is one of prevention. When temperatures and humidities are forecast to reach into the 90's with warm nights, it's time to treat.

Rust diseases, caused primarily by *Puccinia* spp., occur on all commonly grown turfgrasses. The severity of rust outbreaks varies from year to year. Kentucky bluegrass, perennial ryegrass and tall fescue are the cool season grasses most affected by rusts. In the Great Plains and Rocky Mountains, rust usually occurs from mid to late summer until early October. It becomes severe when lack of water, low fertility or soil compaction reduce turf growth. Warm days and moderate night temperatures along with long dew periods create optimal environmental conditions for rust.

Heavily rusted turfs appear yellow or orange when seen from a distance. If still in doubt, put on a pair of white shoes and walk across the turf. If it's rusty, they'll

TURFGRASS FUNGICIDES GROUPED BY CHEMISTRY

Fungicide class	Common name	Examples of some trade names
Aromatic hydrocarbons	Etridazole	Koban
	Chloroneb	Teremec SP
	PCNB	Turfcide
Benzimidazoles	Thiophanate-methyl	Cleary's 3336
		Fungo
		Systec 1998
Carbamates	Mancozeb	Fore
	Propamocarb	Banol
	Thiram	Thiram
Carboximides	Flutolanil	ProStar
Dicarboximides	Iprodione	Chipco 26019
	Vinclozolin	Curlan, Vorlan
Nitriles	Chlorothalonil	Daconil 2787
		Daconil Ultrex
		Daconil Weather Stik
Phenylamides	Metalaxyl	Subdue Maxx
Phosphonates	Fosetyl-Al	Aliette
		Prodigy
		Aliette Signature
Sterol biosynthesis inhibitors (DMIs)	Cyproconazole	Sentinel
	Propiconazole	Banner Maxx
	Triadimefon	Bayleton
	Myclobutanil	Eagle
Pyrimidine (DMI)	Fenarimol	Rubigan
B-methoxyacrylate	Azoxystrobin	Heritage

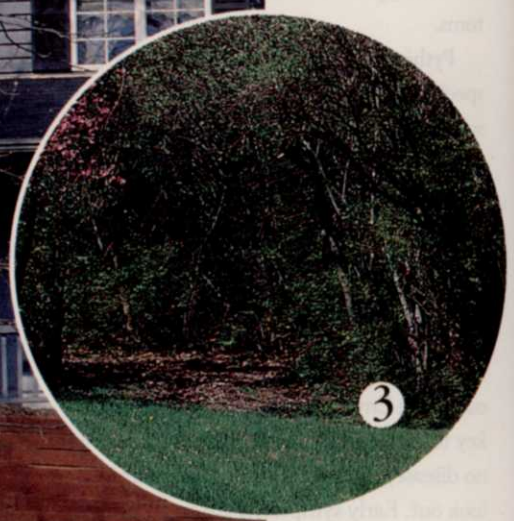
This list is presented for information only and no endorsement is intended for products listed nor criticism meant for products not listed. Check with local specialists for specific recommendations and read and follow label instructions.

This Is A Job For Roundup® Pro.

1

And So Is This

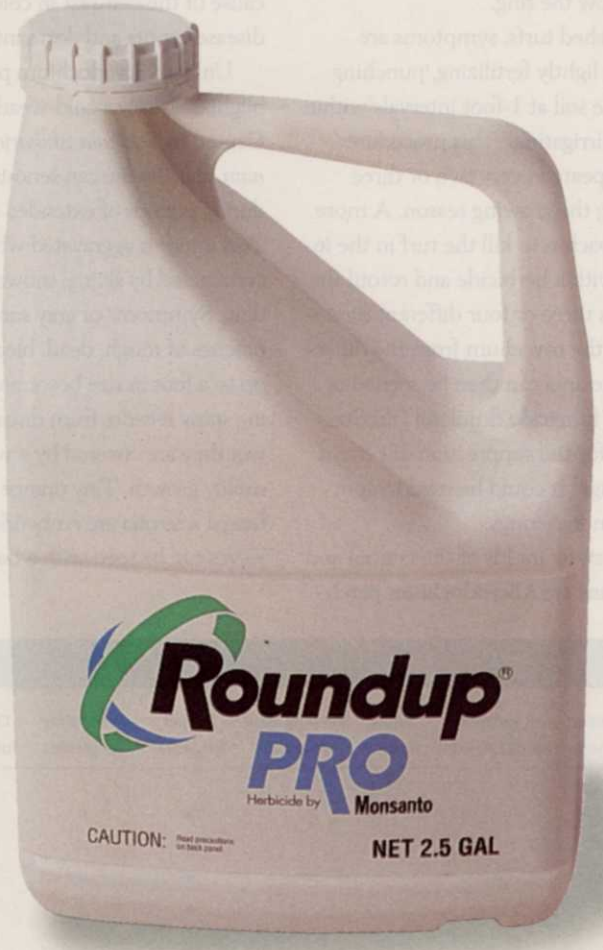
And So Is This



And So Is This

When you're thinking of ways to expand your business and boost profits, Roundup® Pro herbicide may be your most useful tool. Roundup Pro can solve almost any lawn care problem you can think of. And it can create some opportunities that may surprise you.

Think Of All The Possibilities.



1 GIVE NEW LIFE TO LAWNS
Take out areas of old worn, damaged grass or an unsightly varietal mix and start with a clean slate. The control you get from Roundup Pro gives new turf a healthy start. The perfect first step in a total or partial lawn renovation and to long-term relationships with customers.

2 ZAP 'EM AND WHACK 'EM
First, zap weeds with Roundup Pro; wait three days for it to move into the roots; then whack 'em with a string trimmer while they're still green. You'll get fast, effective results in hard-to-reach places. Plus, Roundup Pro gives you complete control—roots and all—with no regrowth.

3 BANISH BACKYARD BRUSH
Expand your horizons by using Roundup Pro to remove brush that can encroach on the perimeter of a backyard. The "roots and all" action of Roundup Pro also eliminates regrowth, so you'll achieve beautiful results that cutting alone just can't provide. It's a great way to increase your "trade area," giving you and your customer more yard to beautify.

4 MASTER MULCH BEDS AND TREE RINGS
Enhance landscapes and add to the natural beauty of the surroundings. It's easy to create mulch beds around trees, shrubs and ornamentals. Just use Roundup Pro to control the vegetation in these areas, then cover with mulch. Spot treatments keep them beautiful and beat hand-weeding, hands down.

To get more information on these and other profit opportunities, call the Monsanto Customer Relations Center at 1-800-332-3111 and ask for these sell sheets by name:

- Roundup Pro. The Brightest Idea Since Roundup.
- Zap 'Em And Whack 'Em. • Mulch Beds Made Easy.
- Backyard Brush Control. • Turf Renovation.
- Questions & Answers About Roundup Pro.
- Roundup Pro In The 21st Century.
- Product Label and MSDS.

Do It Once. Do It Right. Do It With Roundup Pro.

Circle No. 117 on Reader Inquiry Card

turn orange. Close examination of rusted leaf blades reveals the presence of orange to brick-red pustules. Spores within these pustules rub off easily when touched. Each pustule is capable of producing over a million rust spores. Under ideal conditions turf can become heavily rusted about 40 days after initial infection.

Fairy ring injury to a home lawn. Rings most severe in sandy, low-fertility soils.

Rust management begins with the use of improved rust-resistant cultivars. Maintaining vigorous growth throughout the growing season by supplying a consistent source of nitrogen and alleviating compaction will lessen the rust severity. Fungicides may be needed in certain years with the initial application in early July followed by one or two additional treatments at three-week intervals.

The life cycle of **fairy ring-forming mushrooms** is similar to that of other common mushrooms. Fairy ring fungi survive as dormant spores or mycelium. This mycelium becomes active during moderate, wet weather; and the ring continues to grow outward each year. Following rains, mushrooms appear within the dark green ring or at the edge of the dead area. Fairy rings usually are most severe in sandy, low fertility soils low in moisture. The mushrooms grow on decaying organic matter such as a thick thatch. Typically, fairy rings are found as circular patterns of thin or dead grass within a dark green ring of lush grass. The concentric ring of thin or dead grass is the result of drought stress caused by the dense mat of fungal mycelium present just below the ring.

In established turfs, symptoms are "masked" by lightly fertilizing, punching holes into the soil at 1-foot intervals within the ring and irrigating. This procedure should be repeated every two or three weeks during the growing season. A more drastic approach is to kill the turf in the infested area with a herbicide and rototil the entire area in three or four different directions to mix the mycelium from the different rings. The area can then be seeded or sodded. The fungicide flutolanil (ProStar) is registered for the suppression of certain fairy ring fungi. It could be used to spot treat problem fairy rings.

Principle snow molds of the central and northern plains are **Microdochium patch (pink snow mold)** and **Typhula blight (gray snow mold)**. Microdochium patch, caused by *Microdochium nivale*, can injure turf anytime from mid October to April during prolonged cool, wet weather. Infection most often occurs with temperatures between 32°F and 50°F, during cold fogs, or in a light drizzle. Symptoms of pink snow mold are roughly circular rusty brown patches with a salmon-pink moldy growth visible at the edges of the patches. The scattered spots are easily detected, even in midwinter, because of the contrast in color between the diseased spots and dormant turf.

Unlike Microdochium patch, Typhula blight is strictly a cold-weather disease. Caused by *Typhula ishikariensis* or *T. incarinata*, this disease can seriously injure turf during periods of extended snow cover. Turf injury is aggravated when the snow is compacted by skiing, snowmobiling or sledding. Symptoms of gray snow mold are patches of rough, dead, bleached-tan areas up to a foot in size becoming visible as melting snow recedes from diseased areas. When wet they are covered by a whitish-gray moldy growth. Tiny orange to red to black fungal sclerotia are embedded in infected leaves can be seen with a hand lens. **LM**

TURF DISEASE MANAGEMENT GUIDE

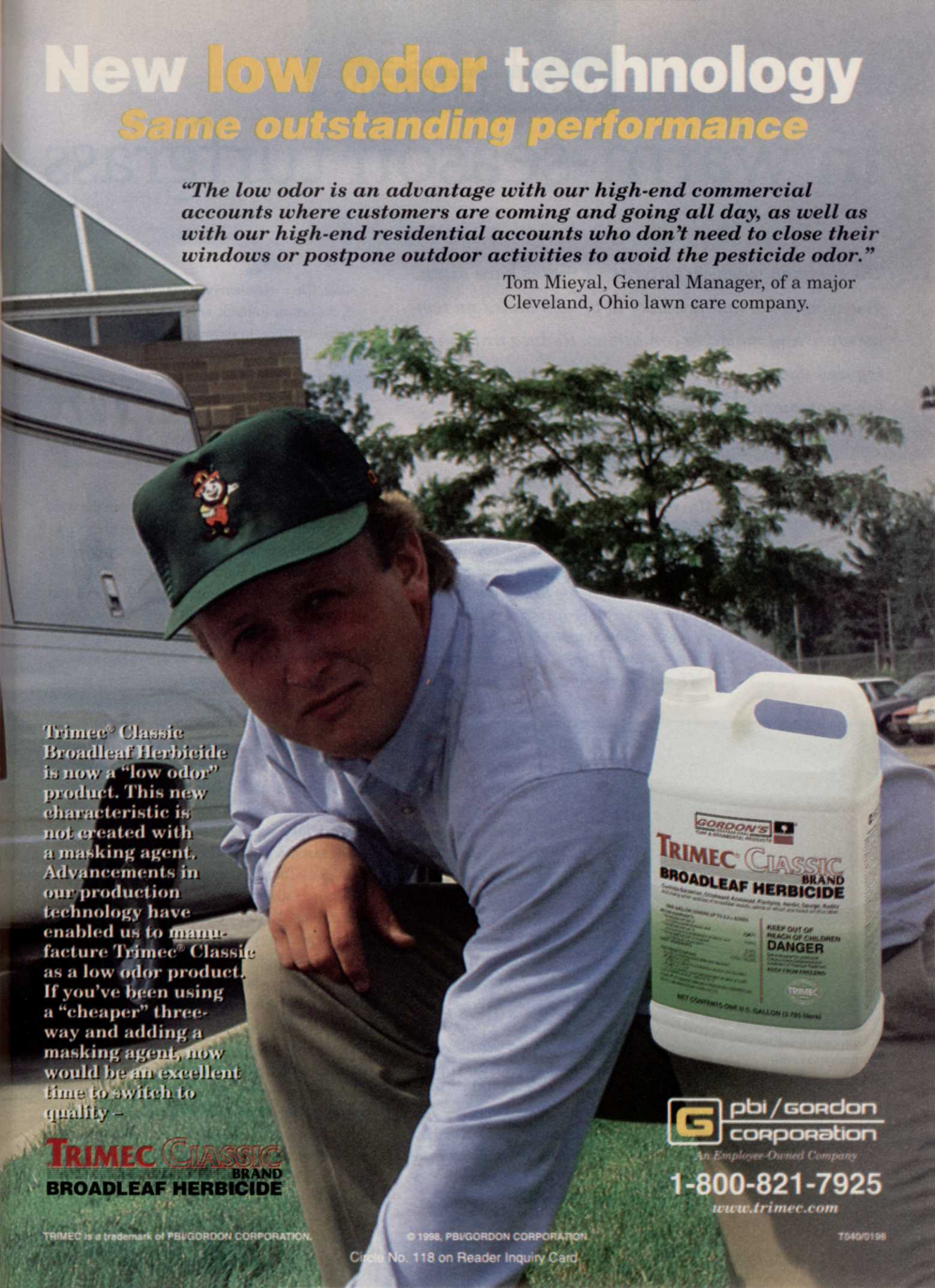
Disease	Resistant varieties	Proper fertilization	Thatch management	Aerification	Improved drainage	Improved air circulation	Snow fencing	Mowing until dormant	Proper irrigation	Preventive fungicides	Curative fungicides	Till the area
Leaf spot/ melting out	x	x	x	x					x	x		
Dollar spot	x	x	x	x					x	x	x	
Brown patch	x	x	x	x		x			x	x	x	
Summer patch		x	x	x					x	x	x	
Necrotic ring spot		x	x	x					x	x	x	
Pythium blight		x	x	x	x	x				x	x	
Rusts	x	x						x	x	x		
Fairy rings		x	x	x							x	x
Snow molds		x	x	x			x	x		x		

New low odor technology

Same outstanding performance

"The low odor is an advantage with our high-end commercial accounts where customers are coming and going all day, as well as with our high-end residential accounts who don't need to close their windows or postpone outdoor activities to avoid the pesticide odor."

Tom Mieyal, General Manager, of a major Cleveland, Ohio lawn care company.



Trimec® Classic Broadleaf Herbicide is now a "low odor" product. This new characteristic is not created with a masking agent. Advancements in our production technology have enabled us to manufacture Trimec® Classic as a low odor product. If you've been using a "cheaper" three-way and adding a masking agent, now would be an excellent time to switch to quality –

TRIMEC CLASSIC BRAND BROADLEAF HERBICIDE

pbi/gordon corporation

An Employee-Owned Company

1-800-821-7925

www.trimec.com

DISEASE MANAGEMENT

in warm-season turfgrass

The common southern turfgrass diseases have distinctive symptoms, and are easy to predict based on temperature and moisture conditions. Reduce traffic, watering and thatch, and use appropriate control products for a combined defensive strategy.

by GARY W. SIMONE, PH. D., University of Florida

The fall overseeding period on bermudagrass in golf courses and other recreational sites has had an increasing incidence of *Leptosphaerulina* blight.

This disease has been a minor leaf blight affecting such cool season grasses as annual and perennial ryegrass, annual bluegrass, creeping bentgrass, fine leaf fescues, and Kentucky bluegrass. The causal fungus, *Leptosphaerulina australis*, has commonly invaded senescent or stressed leaf tissue in the past. Recent years have seen an increased incidence of this disease on rye/bentgrass overseeds and not necessarily on old or stressed tissue.

(PHOTO COURTESY T. FREEMAN)

Bermudagrass with decline symptoms

Leptosphaerulina blight begins on leaf tips, producing a yellowing that progresses down toward the sheath. Affected tissue develops a reddish-brown color prior to the necrosis and shriveling of affected leaves. The fungus does not appear to invade the crown nor roots of the overseed. Affected turf areas have a patchy appearance, exhibiting a reddish color similar to that caused by cold wet soils and restricted phosphorus uptake. Close examination with a hand lens will reveal the brown-to-black, embedded sexual reproductive structures in shriveled leaf tips. The fungus has been known to invade bermudagrass in the absence of an overseeded species. *Leptosphaerulina* likely survives as mycelia in thatch and in the sexual bodies (perithecia) in either debris or soil. Recent dramatic shifts in rainfall due to El Niño may have much to do with incidence of Leptosphaerulina in overseeded grasses and in bermuda.

St. Augustinegrass is still suffering from the widespread incidence of take all root rot caused by *Gaumannomyces graminis* var. *graminis*. However, an increasing number of summer decline samples from urban lawn sites are not associated with take all root rot disease. Samples processed in the Florida Extension Plant Disease Clinic are revealing the presence of *Rhizoctonia zeae* – a causal fungus of leaf and sheath spot on bermudagrass. This disease is similar in appearance to take all disease on St. Augustinegrass but with less root destruction. Turf professionals comfortable with visual identification of take all patch by appearance and timing, are encouraged to take an occasional sample and forward to a diagnostic clinic for verification. Turf sites invaded by *Rhizoctonia zeae* are treatable situations.

Some Familiar Foes

Algae – These are not truly pathogenic on turf but have an adverse impact on turf quality due to competition. The blue-green algae are the primary culprits, invading partially shady sites with high moisture and a freely available nitrogen source. Algal growth produces a slippery condition on the turf and may become so dense that it can prevent irrigation from reaching the root zone. Improving soil drainage and air circulation coupled with verticutting areas with algal mats will aid in management.

Anthracnose – Incidence has been low on centipedegrass due to the mild winter conditions throughout much of the Southeast. Areas with disease are correlated to either poor fertility conditions or nematode populations. Minimizing stress conditions greatly reduces anthracnose development.