TWU Athletic Field Maintenance program

November - December:
Maintain infield skin as needed and weather allows
Mow daily or as needed

January:
Prepare field for practice and play

February - May:
Aerate once as field use schedules and weather conditions allow
Fertilize once as budget and field use schedules and weather conditions allow (mid-March preferred)
Mow daily
Perennial ryegrass transitions out naturally as temperatures reach 90-degree levels
Edge and trim turf as needed
Irrigate skin area to maintain game-ready moisture levels
Drag infield skin daily
Chalk lines for all games
Clean dugouts and bleacher area
Irrigate turf as needed

June - early July:
Fertilize once as budget and field use schedules and weather conditions allow
Mow daily
Edge and trim turf as needed
Irrigate skin area to maintain game-ready moisture levels
Drag infield skin daily
Chalk lines for camp events
Clean dugouts and bleacher area for camp events
Irrigate turf as needed

Mid-July - Mid-August:
Mow daily or every other day (as staff levels allow)
Edge and trim turf as needed
Drag infield skin daily or every other day (as staff levels allow)
Monitor irrigation closely to reduce turf stress during extreme heat
Work on field/facility improvements as needed
Prepare field for fall season

Mid-August -September:
Overseed Bermudagrass with perennial ryegrass (The first week of September if possible with field use scheduling. No later than the third week of September.)
Mow daily
Edge and trim turf as needed
Irrigate skin area to maintain game-ready moisture levels
Drag infield skin daily
Chalk lines for all games
Clean dugouts and bleacher area
Irrigate turf as needed

October:
Aerate once as schedules and weather conditions allow
Fertilize once as budget, schedules and weather conditions allow
Mow daily or every other day (as staff levels allow)
Edge and trim turf as needed
Drag infield skin daily or every other day (as staff levels allow)
Irrigate turf as needed
Work on field/facility improvements as needed
Prepare field for winter season

Year-Round:
Weed, insect and disease control following standard IPM procedures, generally spot treatment only, if necessary and budgets allow

IPM strategies
for warm-season turfgrasses

BY MARIA TOMASO-PETERSON

Bermudagrass (hybrid or common) is the primary warm season turfgrass used for athletic fields in both tropical and subtropical climates. This article focuses on integrated pest management (IPM) strategies for disease control in bermudagrass, but the same concepts can be applied to most warm season turfgrasses. IPM strategies for disease control include appropriate cultural management practices for healthy turfgrass, environmental stewardship, and minimal fungicide usage.

"A healthy plant is a happy plant," is an idea repeatedly expressed by Drs. Jeffrey Krans and Euel Coats, professors of agronomy and weed science, respectively, in turfgrass management at Mississippi State University. That concept is true for all aspects of turfgrass management, including disease control. Fertility, watering, mowing, thatch control, and aeration are key practices for healthy turfgrass. These cultural management practices interact to create a healthy plant, the first line of defense in disease management.

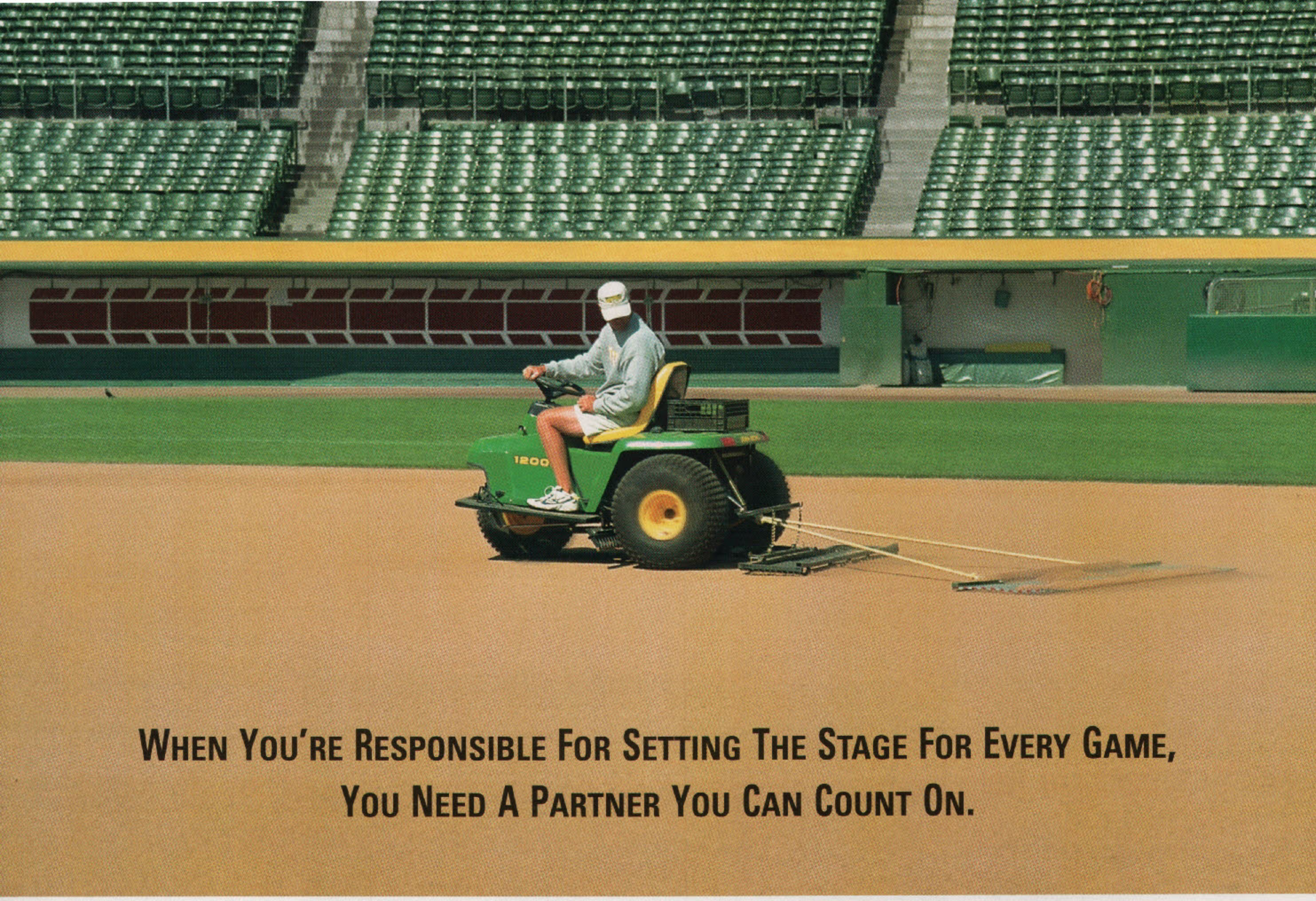
Environmental stewardship includes being acutely sensitive to subtle changes in turfgrass development. Any type of stress caused by environmental fluctuations, mechanical and/or pest damage, or physiological shifts in turfgrass development may result in predisposition to infection by fungal pathogens. Scouting for diseases is a second line of defense in disease management. To be successful, turf managers must be familiar with the dynamic processes of turfgrass diseases. This article reviews the most common fungal diseases that impact bermudagrass managed as athletic turf.

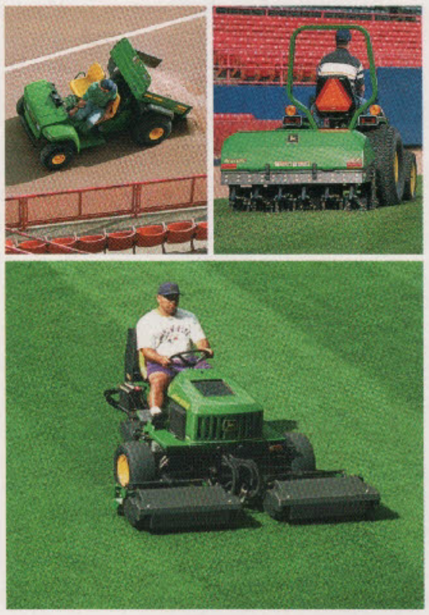
The most predominant and unpredictable bermudagrass disease is commonly referred to as the Helminthosporium complex. Pathogenic fungi can be actively infecting bermudagrass throughout its continual growth cycle, but symptoms are inconspicuous until the plant becomes stressed and/or environmental conditions become conducive for vigorous infection and reproduction of the fungi.

Two fungal genera are commonly implicated in this disease complex. Bipolaris and Curvularia spp. involved in this disease complex may attack all plant parts, and symptoms may be observed as leaf spots, leaf blights, melting-out and/or crown and root necrosis.

Leaf spot symptoms may be observed on leaves and stems of bermudagrass as small, elliptical to circular spots (lesions), dark purplish-brown in color with a dark blackish-brown border (above). Frequently, a yellow (chlorotic) border may be observed. Lesions may enlarge, resulting in total death of the leaf. Older leaves will become symptomatic first, with a progression of lesion development to younger leaves.

Lesions are the result of asexual spores (conidia) landing on the leaf surface, germinating and penetrating leaf tissue, entering and parasitizing the bermuda-





For every job on your field, there's a John Deere made especially for it. A full-line of quality equipment, born out of the suggestions and critiques of sports turf managers and their crews. From quality mowers and tractors to aerators and utility vehicles. But it doesn't end there. We follow it up with the industry's best operator manuals, tech literature, and support hotline. We deliver quality parts 365 days a year, with a 99.5% fill-rate overnight. And we offer the JDC™ MasterLease, the most cost-effective way to acquire turf equipment. For more on how John Deere can make a difference on your field, call your local John Deere distributor or 1-800-537-8233.

NOTHING RUNS LIKE A DEERE®

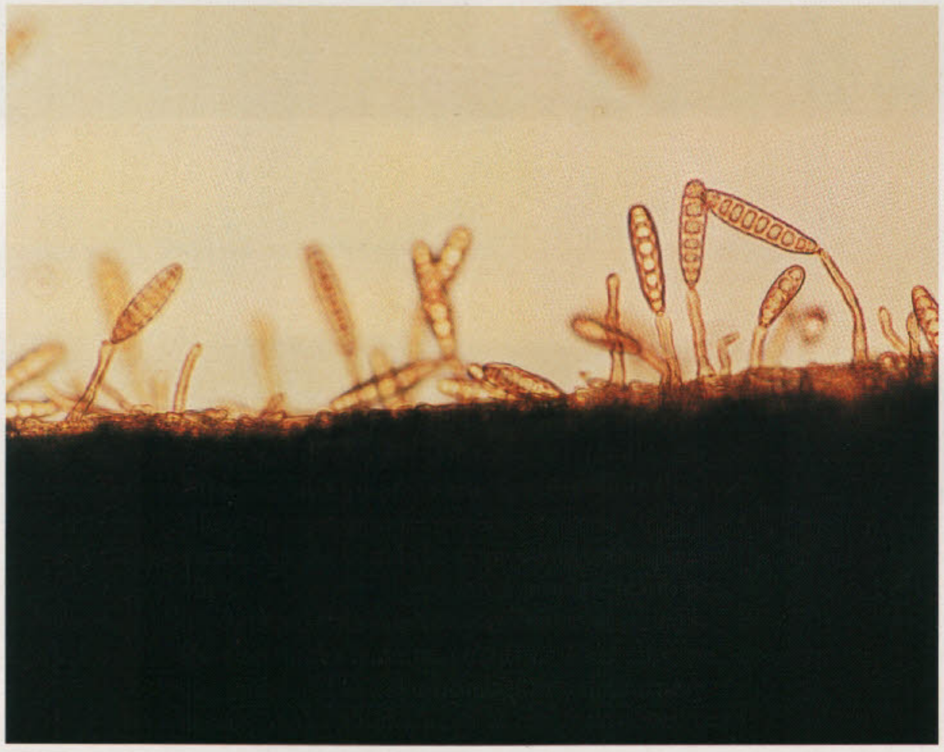
JOHN DEERE

Circle **061** on card or www.oners.ims.ca/2080-061

www.JohnDeere.com

grass plant. This dynamic process is referred to as infection. Conidia are produced by the fungal pathogen on infected tissues and disseminated by wind, rain, and mechanical transport (top).

Conidia may spread distances from an infective site and repeat the infection process in a healthy area of the athletic field. The pathogen is most active when environmental conditions are cool and wet. A moisture film, or "free water," on the leaf surface is necessary for infection. The microenvironment within the turf canopy must be cool (75 deg. F is optimum), and wet before leaf spots will develop. This disease is favored by prolonged periods of leaf wetness that result from cloudy, foggy, rainy days, or late afternoon irrigation. With the advent of warmer temperatures and sustained moisture in the turf canopy, these pathogens can migrate down the plant and infect crowns and roots. Dark brownish-black necrosis of crowns and roots can be observed on infected plants. The leaves will become yellow (older leaves first), then quickly turn brown and produce brownish-purple, irregular patches in the bermudagrass turf (below).



Melting-out symptoms initially develop on the leaf sheath progressing to the leaf as water-soaked lesions, dark reddish-purple to black in color. A chlorotic border fading into healthy green tissue often surrounds lesions. Colonization by the fungus becomes so extensive, the leaf is girdled and falls off. The leaf-dropping phase of the disease gives rise to the name "melting-out". Melting-out commonly occurs when air temperature is above 85 degrees F and relative humidity is greater than 85 percent.

Disease management

Symptoms associated with the Helminthosporium complex will occur when environmental conditions are conducive, and the bermudagrass is experiencing stress. Stress factors may include extended periods of low light that slows down plant metabolism, excessive nitrogen fertility, improper P and K levels, hormonal-type fungicide and herbicide applications, and drought stress. In addition, excessive thatch layers and leaf clippings provide nutritional food for fungal pathogens to grow saprophytically and produce conidia. These stress factors, and "environmentally friendly" microenvironments for persistent fungal pathogens, may be reduced through good cultural management practices. Plant resistance is a key factor in any IPM program. Unfortunately, bermudagrass varieties used for athletic fields lack resistance to Bipolaris or Curvularia spp.

A third line of defense in disease management is minimal fungicide input. Fungicides are most effective when used in a preventive manner with efficacy against the fungal pathogen inciting the disease. Leaf spot, leaf blight and melting-out, all foliar diseases, require a spray volume of 1.0 gal/1000 sq. ft. compared to a spray volume for crown and root necrosis of at least 2.5 gal/1000 sq. ft. The higher spray volume for crown and root necrosis permits penetration of the fungicides to infected plant parts. It is recommended that fungicides used for controlling root diseases be watered into the root zone to a depth of 0.5 to 1.0 inch immediately following application.

Selecting a fungicide with a contact or penetrant mode of action should be considered to maximize effectiveness and minimize applications. Contact fungicides are active on plant surfaces, but may wash off, and usually have a short period of effectiveness. This may necessitate additional applications. However, contact fungicides typically have a broad biochemical mode of action, resulting in minimal development of fungicide resistance.

Penetrant fungicides have chemical activity within the plant. Penetrants may be localized (remain in the area of initial entry) or acropetal (translocated upwards in the plant from the point of entry); only one truly systemic (translocated both upwards and downwards in the plant) penetrant is commercially available.

Penetrants are most effective for bermudagrass root diseases because they can be watered into the root zone, absorbed by the roots and translocated up the plant for complete protection from fungal attack. Penetrant fungicides are absorbed into the plant and provide a longer period of effectiveness, which translates into minimal applications. Penetrant fungicides generally have a specific biochemical mode of action, resulting in selective fungal resistance. Fungal resistance to fungicides can be managed by explicitly following label recommendations and alternating modes of action and fungicide chemistry.

Environmental stewardship is also an integral part of IPM strategies for disease control. The turfgrass manager should maintain accurate records of disease outbreaks, when and where they occurred, and cultural management practices, and fungicides that were effective in controlling diseases. You should also know the disease profile, symptomatology, and environmental conditions favoring disease development is a key factor in successful IPM strategy for disease control.

Distance diagnostics (digital images of turfgrass symptoms), together with plant samples submitted to a plant diagnostic laboratory, can assist in development of an accurate diagnosis quickly. **ST**

Maria Tomaso-Peterson is a Ph.D. candidate in the Department of Entomology and Plant Pathology at Mississippi State University. Her emphasis in plant pathology is turfgrass diseases.

Isn't it time you had the home team advantage?

Aeration tines are changing and so are aerating practices. More and more sports turf manager are discovering some remarkable improvements in their turf after adopting an extended aeration program. We offer versatility when it comes to aeration, with 4', 6' or 15' widths, three point hitch or tow-behind, along with your choice of five tines. (BA-600 Super-Ject 6' aerator pictured).

Bannerman topdressers are built to the highest engineering standards, hydraulically controlled to ensure uniformity and economy. We have a variety of sizes, from 1.5 cu. yd. to 7.5 cu. yd. and one to fit all your requirements. (BTD-20 Turf Topper pictured).

The B-SDS-4 Simple Dimple Seeder is Ideal for thickening turf and filling in worn or bare spots. Surface disturbance is a thing of the past, along with shutting down a sportsfield for seeding. Featuring accurate and adjustable seed rates to meet the needs of all types of seed varieties.

www.sportsturfmagic.com

CANADA 1-800-325-4871

USA 1-800-665-2696

41 Kelfield Street, Rexdale, Ontario, Canada M9W 5A3

BANNERMAN

THE HOME OF SPORTSTURF MAGIC

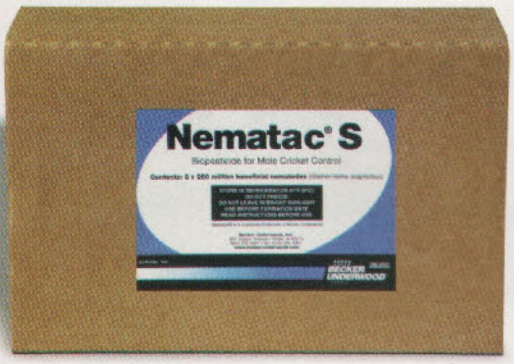
Part No. 00758

INSECTICIDES/FUNGICIDES

The Andersons	800-225-2639	FMC Specialty Products	215-299-6000	Regal Chemical	800-621-5208
BASF Professional Turf	800-545-9525	Griffin LLC	800-237-1854	Sipcam Agro USA	800-295-0733
Bayer Environmental Science	201-307-9700	Kincaid Inc.	800-951-3377	Syngenta	800-334-9481
Becker Underwood	800-232-5907	LESCO	800-321-5325	TopPro Specialties	800-888-5498
Cleary Chemical	800-524-1662	Opti-Gro	800-527-9919	United Horticulture Supply	303-487-9000
Dow AgroSciences	800-258-3033	PBI Gordon	800-821-7925	Valent USA	800-89-VALENT

BIO-PESTICIDE

Becker Underwood introduces Nematac S, a bio-pesticide that uses a natural enemy instead of chemicals to control damaging mole crickets. The beneficial nematodes become active when applied to a soil profile and use mole crickets as hosts. The microscopic nematodes enter inside the mole crickets and release lethal bacteria. The mole cricket becomes a food source for the nematodes, which will reproduce and continue to attack the mole crickets infesting the turf.



Becker Underwood/800-232-5907
For information, circle 173 or see www.oners.ims.ca/2080-173

STROBILURIN FUNGICIDE

Compass fungicide is a broad-spectrum strobilurin fungicide that offers a revolutionary mesostemic mode of action delivering the highest efficacy at very low rates against turfgrass diseases. Controls brown patch, anthracnose, leaf spot, red thread, and gray leaf spot. Does not flare dollar spot, and there is no risk of growth regulation effects.

Bayer Environmental Science/800-331-2867
For information, circle 177 or see www.oners.ims.ca/2080-177

SYSTEMIC FUNGICIDE

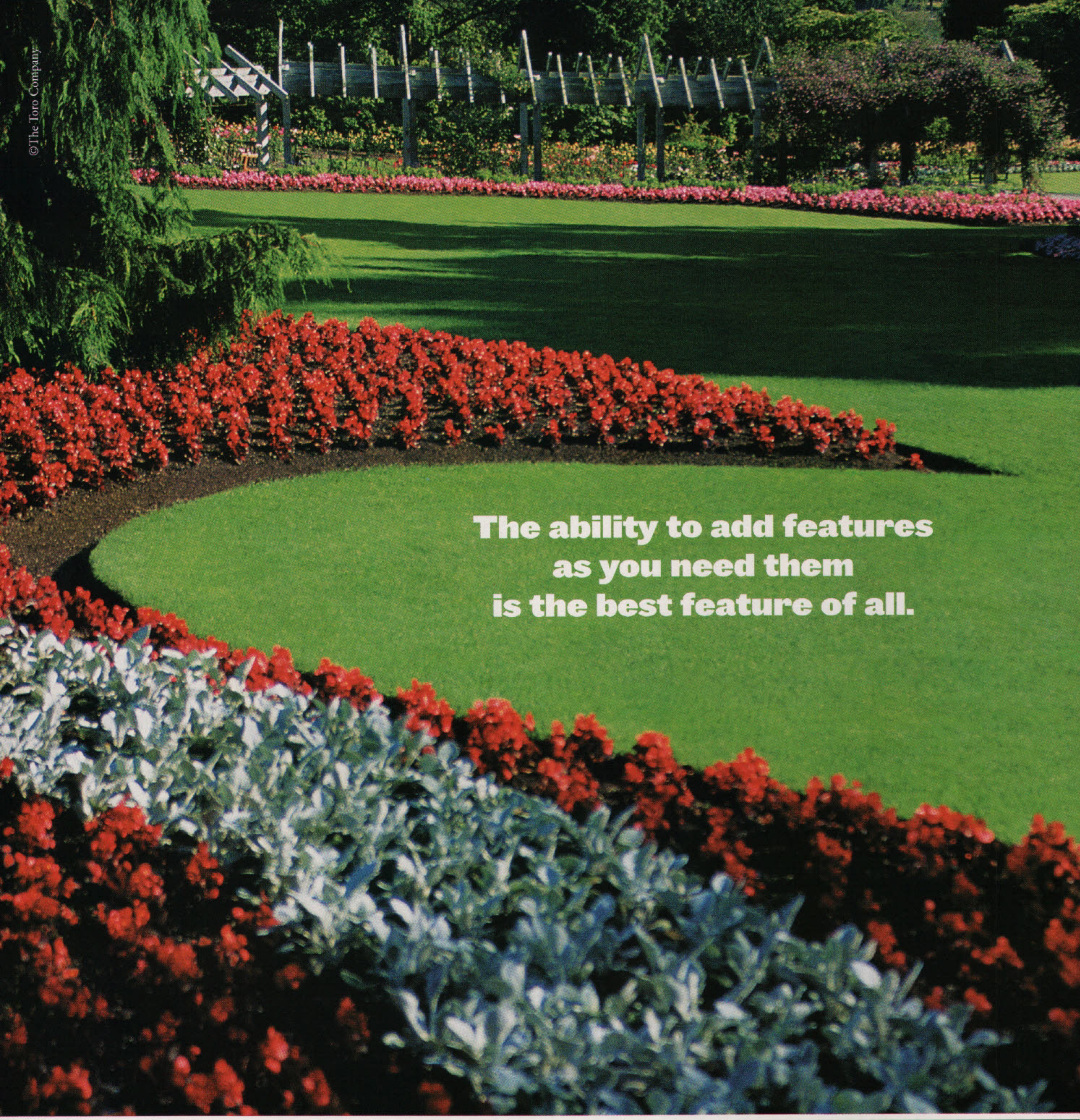
Lesco has available its new T-Storm turf fungicide with thiophanate-methyl in 8-oz. water-soluble bags or 2.5-gal. containers. The product can be used on cool-and warm-season turfgrasses, flowers, ground covers, trees, and shrubs, and tank-mixed with other fungicides, insecticides, or fertilizers. It controls a range of diseases including brown patch, summer patch, anthracnose, dollar spot, gray leaf spot, etc.

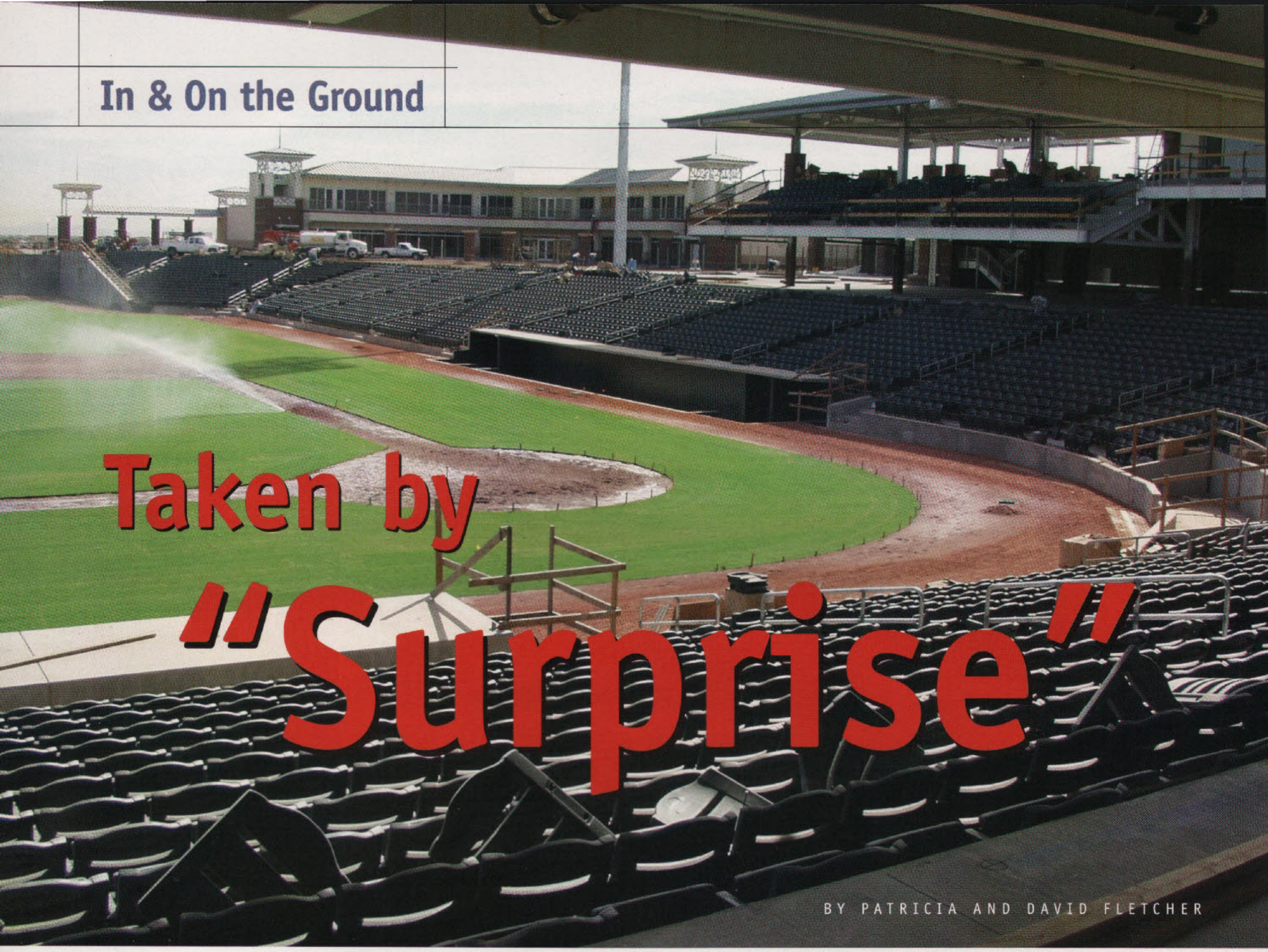
Lesco/800-321-5325
For information, circle 181 or see www.oners.ims.ca/2080-181

SPECIALTY FUNGICIDE

Eagle specialty fungicide wipes out 18 turf-destroying diseases, including dollar spot, brown patch, summer patch, red thread, spring dead spot, copper spot, necrotic ring spot and anthracnose. A single application of Eagle will deliver up to 21 days of proven disease control.

Dow AgroSciences LLC/800-255-3726
For information, circle 176 or see www.oners.ims.ca/2080-176


The ability to add features
as you need them
is the best feature of all.



Taken by "Surprise"

BY PATRICIA AND DAVID FLETCHER

When the City of Surprise, AZ, announced plans to build one of the most ambitious pro training sites to date, it came as, well, a surprise. After all, this farming community located 25 miles on the outskirts of Phoenix has a modest population of about 50,000. Astonishment soon turned to shock, however, when the city managed to woo not one but two major league teams, the Texas Rangers and the Kansas City Royals, to hold spring training there. But late last February, all that was felt was pure joy as the crowd witnessed the opening pitch in the West's shiny new stadium.

Surprise may be small, but it obviously thinks big. Not only has the city managed to build this 15-field sports complex, but also plans are to spur growth by surrounding it with a 200-acre downtown center. Slated for completion this summer, the municipal hub will be graced with 58 acres of parks, a 5-acre lake, an aquatic center, library, and city administrative offices. Furthermore, city officials envision this downtown, with its centerpiece sports complex, as being as significant as Phoenix is now by the year 2040.

Surprise officials also think smart. Cream-of-the-crop sports-field architects and engineers HOK Design Build and Charlotte Engineering Sports Group were hired to design and build the complex. After gleaning the premiere features from stadiums throughout the states, they came up with a 10,500-seat, stadium/amphitheater that's upscale yet fan-friendly, the way spring training games ought to be.

For example, baseball fans traditionally enter stadiums behind home plate, but in Surprise fans enter through center field for a closer feeling with the teams. To accomplish this, a 14-foot below-grade bowl and stadium were built. Players enter the stadium through both the right and left field tunnels, instead of just down a right field line, also making them feel more accessible to fans.

Fifty-eight acres of parks, a 5-acre lake, an aquatic center, library, and city administrative offices will surround the new stadium.

Maintenance matters

The engineers created an equally high-tech playing field. They had planned an extensive hard-pipe drainage system, but after consulting area farmers, dry wells hard-punched into the soil became the solution. Adding to the wells, they dug deep and laid drainage tiles on the soil, covered it with pea gravel and topped it with USDA-certified sand as root-zone soil for the advanced hybrid bermudagrass sod. All this adds up to a playing field that makes a quick comeback after heavy stress and rainfall.

"Over a 2-day span early in the spring training games, we had 3-3/8 inches of rain, which is more than