



**Ruppert Landscape Company at the grand re-opening of 'La Polvosa' (the dust bowl) in D.C. Work is done by the company but the re-opening lets everyone contribute to their community.**

Hall, it didn't realize how much excitement the project would generate.

"There had been a parking lot there," says Dave Ramsey, a regional vice president with The Groundskeeper. "The community wanted something there that embodied the spirit of Tucson and its founders."

The company, founded in Tucson about 22 years ago, donated labor and materials and worked with community groups—committees, councils, and artists—to complete the garden/landscape project.

"As we started working on it, more and more people became interested in it. It really snowballed," says Ramsey.

This wasn't the first time (and certainly not the last, says Ramsey) that The Groundskeeper tackled a special project.

The community involvement at Lied's Landscape Design & Development, Sussex, WI, goes beyond volunteering labor or materials for special projects which, of course, it does. The 52-year-old company encourages employees to participate individually in volunteer, civic and church activities, says company spokesman Judson Griggs.

In fact, anyone serious about progressing as a manager with Lied's *must* be active in his or her community. This might include speaking to service groups or garden clubs, participating in high school career days, or helping organizations like The March of Dimes or the MS Society.

Besides distinguishing Lied's and its employees from its competition, community involvement helps Lied's personnel develop enriching personal and professional contacts too, explains Griggs.

Company personnel participate in organizations like the Rotary Club, chair events like the Easter Seals, and speak before school groups or help out in Earth Day programs and cleanup days.

One of the big events in the Ruppert calendar each year is the company's annual training day. These day-long, hands-on training exercises for field personnel often involve a specific community project.

While not all of them are as dramatic as in 1992 when 300 Ruppert employees renovated and resodded a soccer field (known locally as 'the dust bowl') at the Lincoln Multicultural Center in downtown Washington D.C., all are greatly appreciated.

"The company does benefit from the visibility provided by the publicity but, ultimately, the benefits to Ruppert are in the building of relationships: in the community, with clients and among our own employees," says Ruppert's Kathleen Sheetz.

So, you don't run a big operation like Ruppert, Lied's or The Groundskeeper, and can't pull off the big project, should you bother to get involved too? Yes!

Actually, Dale Woulf of Northwest Grounds Maintenance near Seattle wasn't thinking of the thanks he'd get, or the publicity, when he raised more than \$7,000 to rebuild a Little League field; he was thinking baseball. As a founding

Ruppert Landscape Company, headquartered in Ashton, MD, considers itself "a resource" to the public within its many market locations.

member of the Fall City Little League, Woulf saw where his know-how could make a big difference. And it has.

His efforts led to a new properly draining diamond with dugouts, benches, and a new backdrop. Years later Woulf and his company continue to maintain the field as a service to the local ball players.

"The green industry can play an important role in the beautification of our communities," says Woulf. "I wanted to apply my skills to make a difference in Fall City."

—additional reporting Nancy Stairs

## Bug mobile touts IPM

Broccolo Tree and Lawn Care has a bug that weighs a ton and drives around Rochester. The new model VW beetle is painted in a ladybug pattern, and is meant to highlight the need for 'beneficial insects'.

"The Good Bug is another way for us to emphasize our commitment to Integrated Pest Management," says company President, Laurie Broccolo.

Broccolo Tree & Lawn Care's other community outreach activities include a traveling puppet show for children; GardenScape seminars and an annual Field Day at the Tinker Nature Park/Hansen Nature Center in Henrietta, NY.



## 'Ambassadors' get a warm welcome

"It's fun, it really is," says Bill Prest, superintendent at Sweetbriar Golf Club,

Avon Lake, Ohio. "I've probably given 15 to 20 talks, and my experiences have been very, very positive."

Prest is one of a growing, but still small, group of "ambassadors".

These golf superintendents and lawn



Bill Prest enjoys speaker's role.

care professionals speak in front of civic and school groups within their communities. They explain their professions, and talk about products and equipment they use.

The Ambassador Speakers Program is jointly supported by GCSAA, PLCAA and RISE.

"I've incorporated some information about the environment and about pesticide use into a slide program," says Tom Gray, CGCS, superintendent at Franklin Hills Country Club, near Detroit. "I start with a slide of Augusta National and show them what we try to achieve. Then I talk about the responsible use of pesticides and, and about our efforts to protect the environment."

So far there are about 35 ambassadors. They all participated in one-day training programs before they began taking speaking assignments. The first group received instruction in Cincinnati in November 1996. The second group trained in Atlantic City, NJ, this past December.

Prest says he's talked to civic clubs (Rotary, Kiwanis, Lions) and to local school groups. While all are attentive, the response from the youngsters is usually more spirited. They particularly enjoy learning about the wildlife on golf courses. Then he helps them build bluebird or bat houses.

Prest says audiences seem to be genuinely interested in his message. Even so, he acknowledges that some of the people

he's spoken to "have some real concerns" over the use of pesticides.

"These concerns are usually unfounded, but they're there," he says. "You have to be prepared for this."



Tom Gray focuses on environment.

"I've had no negative reaction whatsoever," adds Randy Zidik, CGCS, superintendent at Rolling Hills Country Club near Pittsburgh. "I've been surprised by how interested people are in golf course maintenance."

Jon Cundiff, owner of Turfs Up Lawn Service near Kansas City, MO, focuses on the benefits of turf.

"I try to reaffirm the importance of what we're doing," says Cundiff. "As long as I can help them understand the benefits of what we're doing, they will better appreciate it."

Cundiff enlivens his presentation with true-life experiences from his days on the grounds crew of the KC Royals baseball team and the KC Chief football team.

"The time that I've spent in giving these talks has been minimal compared to the good I think they're doing for the industry," adds Cundiff.

Representatives from GCSAA, PLCAA and RISE met in May to discuss expanding the Ambassador Speakers Program. *To learn more, contact either: Kristi Frey, CGSAA, 800/472-7878; Karen Weber, PLCAA, 800/458-3466; or Elizabeth Lawder, RISE, (202) 872-3860.*

—RH

## Can you answer these questions?

One way to serve your community is by providing it with answers to questions on pesticide use.

In the eyes of some of the public who don't know the full story, pesticides are a villain. This Q&A from Responsible Industry for a Sound Environment (RISE) will help you and your crews face difficult questions.

**Q:** What is a pesticide?

**A:** A pesticide is any natural or synthetic substance that can be used to control or kill pests of any sort, including insects, fungi, rodents and weeds.

**Q:** Do pesticides cause cancer?

**A:** There are a few specific pesticides that have been shown to cause cancer in laboratory rodents. Pesticides do not cause cancer in people. In 1997, a panel of international cancer experts evaluated more than 70 published stories. The panel concluded that it was not aware of any definitive evidence to suggest that synthetic pesticides contribute significantly to overall cancer mortality.

**Q:** Are environmental levels of man-made pesticides and other synthetic chemicals an important cause of cancer?

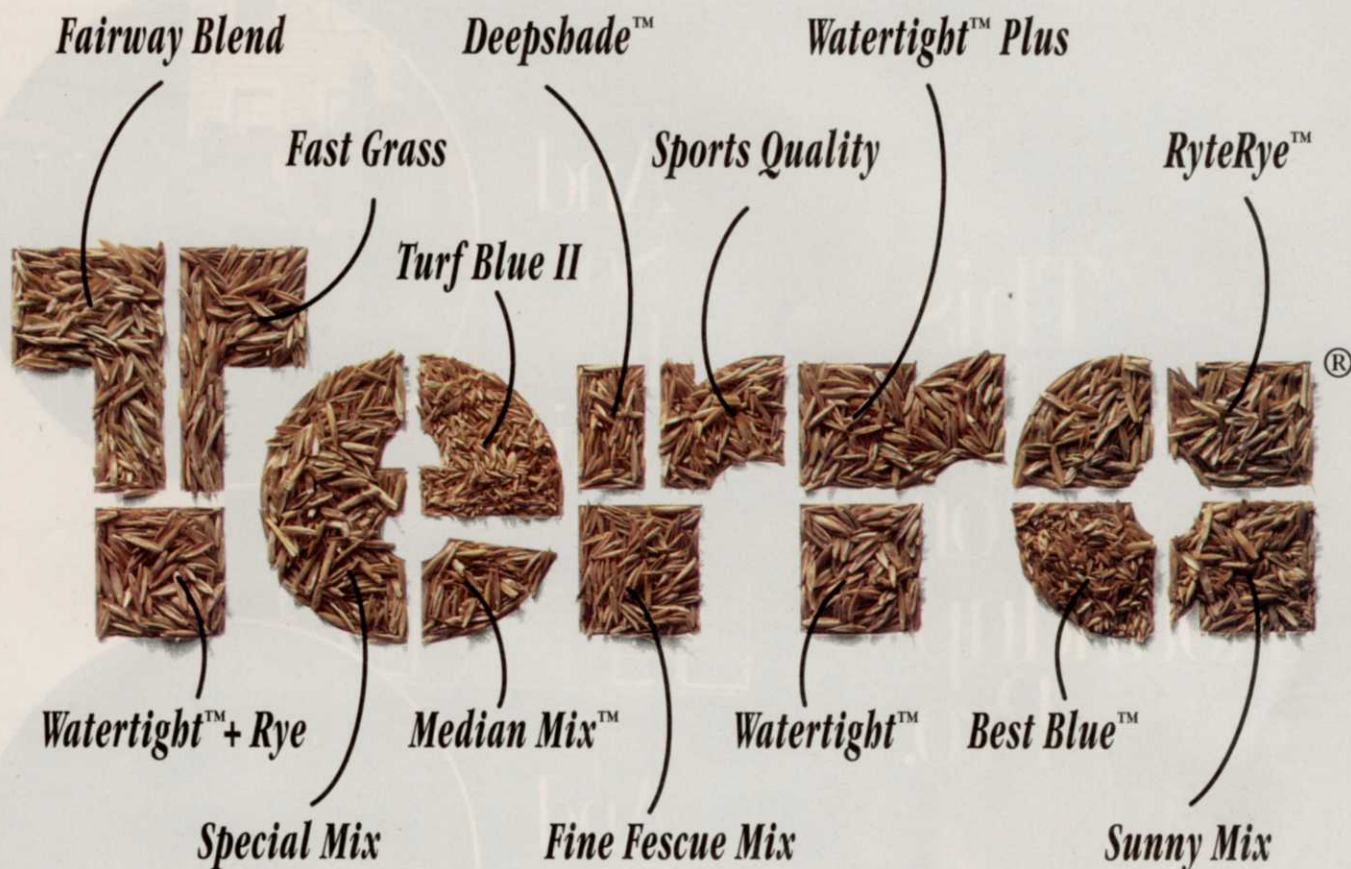
**A:** No population studies and studies of the harmful properties of synthetic pesticides and other industrial chemicals do not support a cause and effect relationship between exposure to low levels of these materials and cancer.

**Q:** Do pesticides cause cancer in children?

**A:** Pesticide exposure is only one of many potential causes being investigated. To be able to say with confidence that no association exists between pesticides and childhood cancer, the potential for such an association must be thoroughly studied. Many of the studies looking at these questions have been underway since the late 1980s. The findings from these studies are being evaluated and should be available by the end of 1999. Other potential environmental causes of cancer are being investigated.

For more information on how to answer these and other pesticide related questions, contact RISE at 202/872-3860.

—TM



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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.

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Walker rotary designed to do the work of a walk-behind with the increased productivity of a rider.



New Holland rider has a cutting width of 60 inches and a height range from 1.5 to 4.5 inches.



The Grand L Series from Kubota is a full line of low-emission, low vibration mowing machines.

# ROTARY MOWERS

By CURT HARLER/ Contributing Editor

Check the ease of servicing on any riding mower. It should be simple to get to the oil dipstick, battery, and other key components. Check how easy it is to adjust the height of the mower itself. Most days will find the operator cutting in a variety of conditions and changing the cutting height should not provide an excuse for major downtime or a trip back to the shop. It's good to have a machine which can handle attachments to do a variety of other light tasks.

If diesel fuel is available at the worksite and the mowers are run long hours, diesel is probably the fuel of choice. No matter how easy diesels are to start, gas engines always will be more forgiving in on-and-off situations. If the business is a mobile one, a gas or diesel powered mower certainly will be the unit of choice. Some office buildings require noiseless operation near the premium executive space in the complex. If the work is being done around an office park or a recreation center where electrical outlets are plentiful, the job may require an electric push mower.

## ROTARY MOWERS

**BEFCO**  
800-334-6617  
Circle No. 250

Both rear-discharge and side-discharge Cyclone finishing mowers are available from Befco. All models have four tires to ensure a perfectly level, even cut, very high blade tip speeds and heavy-duty blade spindles. Cutting heights are quickly adjustable from 1 to 5 inches.

**BUNTON**  
888-423-7897  
Circle No. 251

The BHR Rider features better control with single-wheel, chain-drive steering. Easy-to-reach controls with separate carburetor choke, blade engagement and foot-operated transmission pedal. Customized cutting in 52-, 61- and 71-inch cutting widths. Contoured, padded seat, lumbar support.

**BUSH HOG**  
334-872-6261  
Circle No. 252

Counter-rotating spindle design on the TDM-11 cuts grass and lifts clippings up through two sets of mulching blades rotating in the opposite direction. This exclusive technology from Bush Hog, Selma, AL returns fine clippings to the soil and keeps grass looking neat. Unit requires 40-45 pto hp tractor to operate three 48-inch decks with a total 11 foot cutting width.

**COUNTRY CLIPPER**  
800-344-8237  
Circle No. 253

The zero-turning-radius Commercial Clipper has 25-hp Kohler V-Twin OHV Command engine and 23-inch drive wheels. A 10-gauge steel-reinforced deck is another improvement. The 48- and 60-inch decks have steel plate at trim edge.

**JOHN DEERE**  
**800-537-8233**  
**Circle No. 254**

The F725 Front Mower from John Deere's Commercial Equipment Division, Raleigh, NC is available in 48-inch and 54-inch rotary mower. Designed for small-area commercial operators, it has a two-cylinder 20-hp Kawasaki engine. Cutting height can adjust from 1 to 4 inches with a hand crank.

**DIXIE CHOPPER**  
**800-233-7596**  
**Circle No. 255**

The Suburban Turbine is a 72-inch mowing machine powered by two vertical crankshaft Kohler Command 20 engines. Features an engine oil cooler, hydraulic-drive oil cooler, an Amsoil 1-micron filter, a low-oil warning horn, a Turbinator cyclone pre-cleaner, a Donaldson air filter, stainless steel body panels.



**Exmark Lazer Z has an instant height adjust system.**

**DIXON INDUSTRIES**  
**800-264-6075**  
**Circle No. 256**

Choose from 42, 50 and 60-inch deck options with the ZTR 5022 commercial mid-mount riding mower from Dixon, Coffeyville, KS. Cutting height ranges from 1.5 to 4.5 inches and the low overall weight (615-685 pounds) means it is easy on turf. 1998 model features 22-hp Kohler Command engine.

**ENCORE MANUFACTURING**  
**402-228-4255**  
**Circle No. 257**

The Prowler Front Cut from Encore, Beatrice, NE is available with 52 or 61-inch out front decks with a cutting range of 1 to 5 inches using a single lever. The zero-radius turn machine comes with single or dual tail wheel options and can be powered by a 20-hp water-cooled Kawasaki or 22-hp air-cooled Kohler. Deck flips up for cleaning.

**EXCEL INDUSTRIES**  
**800-395-4757**  
**Circle No. 258**

A new 22 hp Kohler Command engine and a new 60-inch side-discharge deck are available on the ShortCut line of commercial mow-

ers from Excel. ShortCut is the most compact rider on the market, says Excel, shorter than comparable walk-behind mowers. It features zero-turn Hbar Steering, resembling motorcycle steering.

**EXMARK**  
**402-223-6300**  
**Circle No. 259**

The full line of Exmark mowers features floating decks to trace turf contours. The Lazer Z's instant adjust system lets the operator change cutting heights while seated. Made

in Beatrice, NE it runs at 9 mph forward, 4.2 mph in reverse and has true zero radius turning. Four models offer cutting widths of 44, 48, 52 and 60 inches.

**FERRIS INDUSTRIES**  
**315-363-9536**  
**Circle No. 260**

The Z100, by Ferris Industries, Vernon, NY, is the first mower with an independent suspension system. A mid-mount zero-turn rider powered by a 25 hp Kohler, this mower has a 61 inch cutting width, hydro-drive transmission, independent left and right speed control levers, gear-actuated engine kill blade/clutch safety switch, neutral and parking brake safety switch, jumbo 23 inch tires and twin 4 gallon tanks.

**GRASSHOPPER**  
**316-345-8612**  
**Circle No. 261**

With its 28 hp liquid-cooled diesel engine and Gemini2 dual-path hydrostatic direct drive, the zero-radius turn Model 928D2 from Grasshopper, Moundridge, KS provides outstanding maneuverability and productivity for its size. It has



**Grasshopper 928D2 works with all company attachments.**

forward speeds up to 9 mph and accepts the company's complete line of interchangeable decks.

**GRAVELY INT'L.**  
**800-472-8359**  
**Circle No. 262**

The ProMaster 360D front-mount riding mower from Gravelly includes front and rear tie-downs, a transmission brake to secure the unit for safe transport and power steering for ease of operation. It is available with a 22.3 hp Yanmar liquid-cooled diesel and hydrostatic transmission providing speed up to 8.8 mph.

**GREAT DANE**  
**704-846-6617**  
**Circle No. 263**

The zero-radius turn Surfer from Great Dane, Charlotte, NC is just 53 inches long on the 52-inch cut model. Also available are 48 and 61



**Great Dane's surfer cutting height adjusts from 1.5-5.5"**

inch decks made of 7-gauge steel. Units are powered by 16-hp twin cylinder Vanguard, or an 18- or 22-

hp Kohler electric start.

**HOWARD PRICE**  
**314-532-0201**  
**Circle No. 264**

The Turf Blazer 727 features a floatation deck of heavy structural design. Scalping is virtually eliminated with oversized anti-scalp rollers adjusted to your specific cutting conditions. Strength is where you need it, up front, with 11-gauge double wall construction.

**INGERSOLL**  
**920-582-5000**  
**Circle No. 265**

The Grazer 2297K from Ingersoll is a 62-inch front-cut mower. Body is easily removed to expose inner works which include patented chopper screen, hydraulic valve lifters, fan-cooled transmission, Warner Mag-Stop electric clutch and replaceable wear bushings on the push arm pivots.

**JACOBSEN**  
**800-727-JAKE**  
**Circle No. 266**

The HR-9016 Turbo wide-area rotary mower from Jacobsen, Racine, WI has a 16-foot cutting width and 8.5 mph speed, letting it handle 16.5 acres per hour. New this year, the HR-9016 has a 90-hp turbocharged diesel engine and 4-WD which is engaged whenever the mow switch is activated.

**F.D. KEES**  
**402-223-2391**  
**Circle No. 267**

The ZT Max Mid-Mount Rider features a low center of gravity and wide body for hillside stability. The dual-lever, hydraulically dampened operator controls provide smooth and instant steering control. Travels up to 9 mph. Available with a 22- or 25-hp Kohler Command V-twin engine; 52- or 61-inch decks; mulching kit.

**KUBOTA TRACTOR**  
**1-888-458-2682**  
**Circle No. 268**

The Grand L Series is a full line of low-emission, low vibration machines from Kubota, Torrance, CA. Available with E-TVCS (three vortex combustion



**Jacobsen HR 9016 Turbo has a 16-foot cutting width and 8.5 mph speed.**

system) diesel engines in 2- and 4-wheel drive, they come in 32.1, 35.2, 38.5 and 45.3 hp models. Glide Shift transmission features clutchless on-the-go operation through all 8 forward and reverse gears.

**LASTEC**  
800-515-6798  
Circle No. 269

The Articulator is the solution to uneven terrain, says Lastec. The 325E articulates three 25-inch decks to deliver a precision 72-inch cut. The mower rides low, wide and stable so it handles extreme contours without scalping.

**LAWN BOY**  
612-888-8801  
Circle No. 270

The Lawn-Boy 21 inch commercial mowers feature a tough, lightweight cast-aluminum deck, steel wheels with ball bearings, and a cast iron cylinder sleeve for durability. Made by Toro, Bloomington, MN, these mowers feature DuraForce 6.5 hp 2-cycle engine.

**LELY CORPORATION**  
252-291-7050  
Circle No. 271

Rear-mount grooming mowers are designed for estates, parks, golf courses and municipal maintenance. The KRM-60 has a 60-inch cut with a blade speed of 2690 rpm. It requires a 15-30 hp tractor. The KRM-72 is a 72-inch unit cutting at 2290 rpm. The KRM-84 Heavy Duty operates behind a 25-50 hp tractor with a 540-rpm pto.

**LESCO**  
440-333-9250  
Circle No. 272

Both the LCR2200 and the LCR7400 feature two-pedal hydrostatic controls, independent wheel brakes for tight radius turns, and hydraulic weight transfer valve for increased traction on hillsides and in the wet, and vertical tilting deck for easy removal and installation of blades.

increased traction on hillsides and in the wet, and vertical tilting deck for easy removal and installation of blades.

**MTD Products Inc.**  
330-225-2600  
Circle No. 273

The MTD Pro series features two Direct Effect mowers with instant forward and reverse operation with cruise control. The 4815F has a 15 hp engine and 48 inch floating stamped deck, while the 5416F has 16 hp and a 54 inch deck.

**NEW HOLLAND**  
717-355-1121  
Circle No. 274

The CM 222 from New Holland, New Holland, PA has a cutting width of 60 inches and a height range from 1.5 to 4.5 inches. The side-discharge mower is powered by a 3-cylinder liquid cooled 22-hp diesel. Rear weight bracket is standard.

**RANSOMES**  
800-228-4444  
Circle No. 275

The 951 wing rotary mower from Ransomes Cushman Ryan, Lincoln, NE mows at speeds up to 7 mph and transports at up to 14 mph allowing it to cut 59 acres in an 8-hour day. Unit can be equipped with one, two, or three decks for mowing and its zero-turn radius makes for outstanding maneuverability. It operates with a Perkins 4-cylinder, 4-cycle, liquid-cooled engine.

**SCAG POWER EQUIPMENT**  
920-387-0100  
Circle No. 276

The hydro drive system on the

Scag STHM provides smooth, even power to both wheels, controlled by a convenient, single foot-pedal control. The Scag STHM is available with a 52-, 61-, or 72-inch cutter deck and 20- or 22-hp Kohler Command engines. Optional accessories include a 44-gallon capacity grass catcher with auxiliary engine.

**SNAPPER, INC.**  
770-954-2500  
Circle No. 277

The tractor-style Peerless transmission on the SPE1250KW Pro Express mower from Snapper offers five forward speeds from 1.5 to 6.5 mph and one reverse. This



36-inch commercial walk-behind is powered by a 12.5 hp Kawasaki engine. Automatic pistol grip controls, electric PTO, and 16-inch drive tires for superior ground clearance.

**TORO**  
612-888-8801  
Circle No. 278

The Z Master Mid-Mount ZRT (zero radius turn) mower from Toro, Bloomington, MN comes in two models. The Z252 has a 22 hp Kohler engine with a 52-inch deck. The Z255 has a 25 hp Kohler with a 62-inch



deck. Ground speed of 8.5 mph forward and 4 mph in reverse makes it one of the fastest in industry. Twin 9-gallon

fuel tanks.

**WALKER MANUFACTURING**  
972-221-5614  
Circle No. 279

Designed by the Fort Collins, CO firm to do the work of a walk-behind with the increased productivity of a rider. Five models range from 11-25 hp with gas or diesel engines. Also available are five mower decks ranging from 36 inches to 62 inches with grass collection, side discharge or mulching capability.

**WRIGHT MANUFACTURING**  
301-330-0086  
Circle No. 280

The Wright Stander comes in several compact models, with triple-bladed mowers in widths of 48, 52 and 61 inches. Mowers have a 7-gauge steel deck, rounded trim-side for closer trimming and adjustable anti-scalp rollers on the deck nose. A full range from 16 to 22 hp and choice of electric or recoil start available. Cutting height ranges from 1.75 to 4.5 inches in quarter-inch intervals.

**YAZOO POWER EQUIPMENT**  
800-723-9496  
Circle No. 281

The ZT Max midmount rider from Kees, Jackson, MS features a low center of gravity and wide stance. Dual-lever hydraulically dampened operator controls provide smooth, instant steering control. Unit has cutting speeds up to 9 mph and runs for a long time on the 10-gallon fuel tank.

**ZIPPER MOWER**  
888-876-6937  
Circle No. 282

Standard electric deck lift is just one of the many features of the Zipper-TS mowers that make them easy to operate. Made in Augusta, KS, these mowers come with 20 or 22 hp engines, allowing speeds up to 6.2 mph, and in cutting widths from 54-74 inches. The frames on these zero-turn radius machines are 10 gauge steel, the bodies 14 gauge. LM





# 1998 EMERALD AWARDS

**ANNOUNCING:** the third annual LANDSCAPE MANAGEMENT "Emerald Awards". LANDSCAPE MANAGEMENT magazine is offering a \$500 first prize to the winner of a random drawing to be held on July 1, 1998. Second prize is \$300 and third prize is \$200 in cash. To be eligible for the drawing, simply fill out the questionnaire at right and return it to LM's editorial offices.

Answers to the questions will determine our "1998 Emerald Awards" winners, to be revealed—along with the contest winner—in our August issue.

# WIN \$500



**CONTEST REQUIREMENTS:** Contestants must be owners or employees of landscape maintenance companies or lawn care companies; or maintenance employees of a golf course or country club, including superintendents and assistant superintendents; or an athletic field manager or member of an athletic field maintenance crew; or manager or member of a facility landscape management crew.

Product selections must be currently used by entrant.

Employees of Advanstar Communications or their families not eligible.

All questions on this entry form must be completed, and all blanks filled. One entry per person. No more than five entries from any one employer will be allowed. Entry forms will appear in the February-June, 1998 issues of LANDSCAPE MANAGEMENT.

Completed questionnaires should be mailed to: Emerald Awards, LANDSCAPE MANAGEMENT, 7500 Old Oak Blvd., Cleveland, OH 44130. They must be received by noon, July 1, 1998.

A random drawing of all eligible entry forms will be held July 1, 1998. Winners will be notified within 24 hours.

## OFFICIAL ENTRY FORM

### QUESTION:

What is your favorite brand name of...

CHECK HERE IF YOU DO NOT USE

- riding mower?
- walk-behind mower?
- turf fertilizer?
- pre-emergence herbicide?
- post-emergence herbicide?
- turf insecticide?
- turf fungicide?
- plant growth regulator?
- compact tractor?
- turf aerator?
- pick-up truck?
- leaf blower?
- line trimmer?
- chain saw?
- Kentucky bluegrass?
- perennial ryegrass?
- turf-type tall fescue?
- turfgrass mix or blend?
- biological control product?

NAME: \_\_\_\_\_

EMPLOYER: \_\_\_\_\_

CITY/STATE: \_\_\_\_\_

PHONE NUMBER: \_\_\_\_\_

(AC ) \_\_\_\_\_



# Know ornamental disease symptoms

*Three factors make diagnosing ornamental disease problems difficult: the wide host range, the influence of urban environments and varying management practices.*

by JANELL JOHNS, Ph.D., Texas A&M University

**A** systematic approach is a big help in diagnosing disease problems with ornamental plants.

It also guides those intimidated by the sheer number of possible problems.

Knowing whether the problem is cultural or environmental (abiotic) as opposed to a problem caused by an insect, mite or disease (biotic) is essential. The systematic approach to plant problem assessment provides an outline to follow to improve your chances of a correct diagnosis. And, a correct diagnosis starts you on the way to better management.

## **Define the problem**

Does a plant problem exist? Identify and inspect the affected plant and surrounding plants. Is the plant growing normally for this species/cultivar at this time of year and age of plant? Know how the plant looks when it's healthy, because we sometimes mistake normal characteristics as problems. Examples of these include unusually large leaf glands or twig lenticels, variegation or seasonal foliage coloration or synchronous leaf drop from conifers and other evergreen broadleaf plants.

Compare an affected plant with a healthy plant. Describe the symptoms associated with the problem. How is the plant's growth affected? Remember, while symptoms signal something is wrong, they don't necessarily indicate the nature or location of the cause, especially with root damage or improper soil conditions.

## **Check for patterns, time**

Two important clues for distinguishing between biotic factors and abiotic factors include: