

THE VOICE OF THE GREEN INDUSTRY

LANDSCAPE *management*

FEBRUARY 1998 • \$4

**LM Reports:
turf aerators**

**Native plants
vs. adapted
species**


GUIDE TO:

Fertilization & Nutrition



IT TOOK THE EASY WAY OUT.

**Break the spirit of any cutworm, sod webworm
or armyworm with Conserve* SC turf and
ornamental insect control. It controls tough
pests as effectively as any synthetic. In fact,
symptoms appear within minutes of contact
or ingestion, putting an immediate end to
plant damage. And, since Conserve is
derived from a naturally occurring organism,
it also helps control your worries about
chemical applications and the environment.
Learn more about Conserve. It's Changing the
Nature of Insect Control.™ Call 1-800-255-3726.
Conserve. The end of the line for insect pests.**

 Dow AgroSciences

Conserve* SC

Nature can be one tough Mother.™

www.dowagro.com

Always read and follow label directions. *™Trademark of Dow AgroSciences LLC

INSIDE

THE VOICE OF THE GREEN INDUSTRY

LANDSCAPE management



ON THE COVER: PELICAN HILL GOLF CLUB'S OCEAN COURSE NORTH, #18. THE COURSE IS ONE OF SIX HOSTING THE GCSAA TOURNAMENT. DONALD HOOS IS DIRECTOR OF AGRONOMY. PHOTO COURTESY PELICAN HILL.

COLUMNS

- 4 OPENING SHOTS
- 6 ASK THE EXPERT

DEPARTMENTS

- 12 HOT TOPICS
- 61 EVENTS
- 62 INFO CENTER
- 62 SUPPLIERS CORNER
- 64 PRODUCTS
- 75 AD INDEX
- 71 CLASSIFIED
- 76 GRAB BAG

FEATURES

- 14 **GREAT FOR '98!**
A look at some of the new products coming out this year, to make your job easier and more profitable.
- 19 **TURF MANAGER'S GUIDE TO INSECT IDENTIFICATION**
Sponsored by MACH 2 Turf Insecticide, this guide will help the professional turf manager accurately identify the pests damaging turf.

- 44 **GUIDE TO TURFGRASS FERTILIZATION & NUTRITION**
Most turfgrasses need additional fertilization to achieve maximum growth potential. A look at the products available to turfgrass managers, and how to use them.
JOHN ROBERTS, PH.D.

- 54 **LM REPORTS: TURF AERATORS**
These tools are the ones you turn to when turf needs breathing room and thatch control.
CURT HARLER

- 58 **NATIVE PLANTS: CHOOSING BETWEEN NURSERY OR ADAPTED**
Which is more important, the origin of the plant or its characteristics?
H. S. STEVENS



LANDSCAPE MANAGEMENT (ISSN 0894-1254) is published monthly by Advanstar Communications, Inc. Corporate, editorial and advertising offices: 7500 Old Oak Blvd., Cleveland, OH 44130. Accounting, advertising production and circulation offices: 131 West First St., Duluth, MN 55802.

Subscription rates: one year, \$39, two years \$58 (U.S.); one year \$66, two years \$99 (Canada and Mexico); one year \$130, two years \$195 (all other countries). For air mail delivery, include an additional \$70 per order annually. Current issue single copies (pre-paid only): \$4 (U.S.); \$7 (Canada and Mexico); \$12 (elsewhere); add \$3.50 per order for shipping and handling. Back issues, if available, \$10 (U.S.); \$14 (Canada and Mexico); \$20 (other countries); add \$3.50 per order for shipping and handling (pre-paid orders only). **To subscribe,** call (218) 723-9477; fax: (218) 723-9437.

Office of publication: Advanstar Communications, Inc., 131 W. First St., Duluth, MN 55802. Periodicals postage paid at Duluth, MN 55806 and additional mailing offices.

Copyright ©1997 by Advanstar Communications, Inc. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from Advanstar Marketing Services, Attn: Permissions, 7500 Old Oak Blvd., Cleveland, OH 44130 or phone (800) 225-4569 x742. Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by Advanstar Communications for libraries and other users registered with the Copyright Clearance Center.



Canadian G.S.T. Number: R-124213133, IPM number: 841919

POSTMASTER: Send address changes to Landscape Management, P.O. Box 6198, Duluth, MN 55806.



Seeding?

Knock out the competition...

with the only pre-emerge that prevents establishment of undesirable grasses in newly seeded stands.



- Can be applied prior to, at the time of, or after seeding.
- Highly effective crabgrass control.
- Convenient, sprayable formulation.
- Labeled for use through hydroseeders.

ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

FOR SEASON LONG CONTROL IN ESTABLISHED TURF AREAS, USE BENSUMEC™ 4 LF PRE-EMERGENT GRASS & WEED HERBICIDE.



TUPERSAN®

WETTABLE POWDER HERBICIDE

G pbi/gordon
CORPORATION
An Employee-Owned Company

www.pbigordon.com

Circle No. 127 on Reader Inquiry Card

Hiring has never been harder. Make it easier.



Terry McIver

TERRY MCIVER
Editor-in-Chief

Used to be you could hire just about anyone who walked in the door. They wanted to work. Period.

Now, it's all about references, criminal records and drug tests.

References are okay. It's the other two that, in another era, would cause an employer to shake his head and ask, What's happening here?

Rick Osewalt, director of business management for New England Business Service, Inc., Groton, Mass., says hiring just one unqualified employee can nearly destroy productivity, profitability and

morale in a growing company. Those early days of the company are sensitive, and you can't be spending your time putting out employee fires when you need to be beating the bushes for customers. It's especially bad to lose good employees to a competitor.

"With each employee departure, you forfeit whatever you invested in training, and an amount of knowledge and information that even experts haven't dared calculate," says Osewalt.

Firing someone isn't as easy either, says Osewalt, thanks to increasing government and legislative involvement in labor and employment issues. So now, you must be prepared to possibly defend your decision in court.

Here's some tips from Osewalt on keeping disputes away from your office door:

1. **Demonstrate a businesslike approach** from a prospective employee's first involvement with your company, says Osewalt. Make the application simple to understand. Make job descriptions clear (and detailed), and avoid using words or expressions that denote a possible gender or age preference (salesman; Girl Friday; young).

2. **Maintain complete and up-to-date records** on each employee. Keep job performance files, and include notes on work record, changes in re-

sponsibilities or salary. Make note of warnings you issue, even if they are verbal warnings.

3. **Keep the employees well-informed**, especially when it comes to wages, overtime reporting and safety standards. Encourage open lines of communication. You can dodge many potential problems, says Osewalt, if employees feel they can talk openly about problems or concerns.

Employees aren't always looking for instant solutions to their work-related problems, but they do want to be listened to and taken seriously.

New England Business Service, a 45 year-old company, supplies small business products to more than a million customers, to help improve management, marketing and operation success. **LM**

UNIVERSITY CLIPS

How do metals bind with soil?

Dr. Lynn Katz, a visiting scientist in the **University of Delaware** plant and soil sciences department, focuses on the fate and transport of soil contaminants, with emphasis on metals.

"Soils treated with industrial wastes or sludge result in levels of metals, such as iron, uranium and chromium, which could contaminate groundwater," says Katz.

"By understanding how these metals are transported in the groundwater, we can develop applications to predict the process, thereby preventing the metals from migrating."

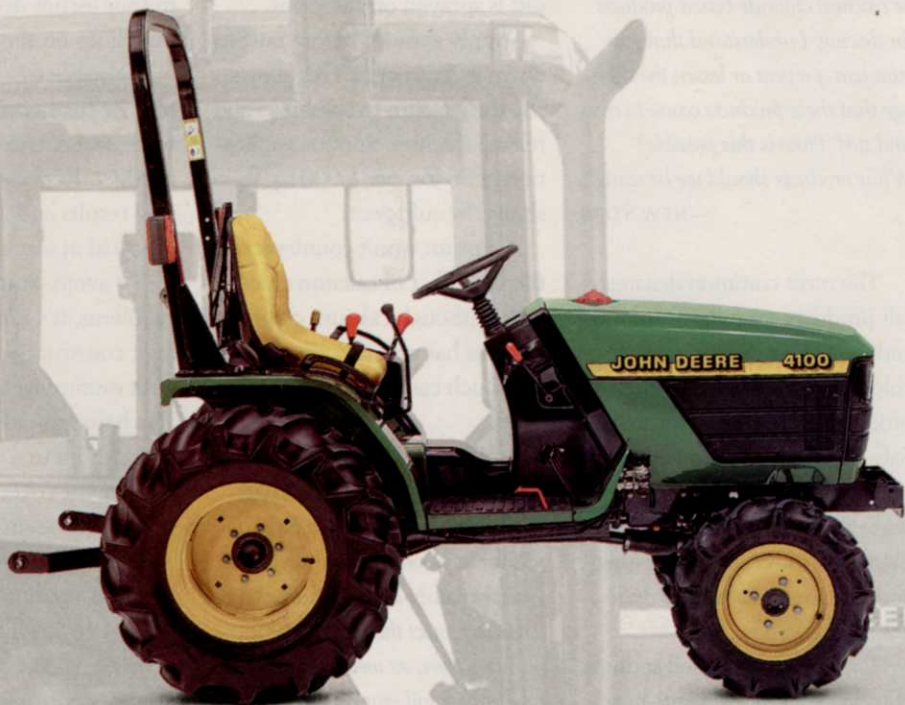
One key to this research is learning how metal ions are bound to soil materials.

New weed research at U.Fla.

Dr. Philip Busey, associate professor of environmental horticulture at the **University of Florida**, reports he is working on control of dollar weed in St. Augustinegrass through irrigation management.

"Dollar weed is essentially an aquatic plant," says Busey, and irrigation practices have long been a contributor to its growth. If you've got it, you can moderate it by backing off on the watering." Dr. Busey is also looking at timing of preemergent herbicides for goosegrass and crabgrass control in golf and athletic field turf.

Big-Time Performance. Just \$9,995.*



Introducing the All-New John Deere 4100. Big-Tractor Features At a New Low Price.

There's a new John Deere compact tractor out there and it brings you **big-tractor performance** for a surprisingly low price. Like its famous "big brothers," the new 4100 has **oil-cooled brakes** that virtually never wear out. A **differential lock** that gets both rear wheels pulling in slick conditions. And **shift-on-the-go front-wheel drive**. You'll never have to stop to get the traction you need.

The 4100 features a clean-burning, fast-starting **diesel**

engine, kicking out 20 horsepower. Choose an economical **8x4 gear transmission**, or get the clutchless, high-performance of an infinite-speed **hydrostatic**. Both transmissions bring you **mid and rear PTOs**. And the hydrostatic's PTO is **fully independent**.

Thanks to **John Deere hydraulics**, the 4100 delivers effortless **power steering**, a responsive **3-point hitch**, and fast loading with the available

John Deere 410 Loader. Other attachments include mid- and rear-mount mower decks, front blade, power broom, snow thrower and Category 1 3-point-hitch tools.

See your John Deere dealer for more details. If you don't know where one is, call us at 1-800-537-8233, or find us on the Web at www.deere.com

*Manufacturer's suggested introductory price for gear model (base equipment only). Price may vary by dealer. Setup charges, freight, taxes, and additional dealer charges (if any) are extra.



Gypsum can reduce salt damage to trees, turf

We have a small snow removal operation. We use sodium chloride or calcium chloride-based products for deicing. I understand that gypsum can prevent or lessen the damage that these products cause to trees and turf. How is this possible?

What products should we be using?

—NEW YORK



BALAKRISHNA RAO
*Manager of Research and
 Technical Development
 for the Davey Tree Co.
 Kent, Ohio*

The most common deicing salt products are sodium chloride and, to a lesser degree, calcium chloride. You may find other products such as urea, rock salt, Safe-Step, magnesium chloride, potassium chloride, and Landscape Ice Melter. Their performance on snow and ice melting, and/or damage to nearby desirable plants varies.

The commonly used sodium chloride is toxic to plants in relatively low concentrations.

Gypsum contains calcium sulfate and is effective in reducing the potential for sodium injury to plants. Gypsum must be applied before injury occurs.

Salt injury can occur either from foliar absorption, or absorption through the roots. If gypsum is present in the rootzone during the time when sodium salt is being applied, the calcium in gypsum prevents sodium from binding to soil particles. Since the sodium is not held in the soil, it can be leached beyond the rootzone with rains, melting snow, or irrigation.

However, if toxic levels of sodium remain in the rootzone, it causes phytotoxicity and tis-

sue hydration. This is called physiological drought. Gypsum may not be helpful in minimizing salt damage to foliage if the salt is sprayed on the plant.

Apply gypsum before putting down sodium salts. This allows the the gypsum to solubilize and release calcium. Surface application of 50 lbs. per 1,000 sq. ft. should be sufficient.

Gypsum won't counteract the salt effect of calcium chloride. Although calcium chloride is not as harmful as sodium salt, too much can harm plants.

Tree roots need protection from construction

We're working with a large developer at a construction site which was previously a wooded area. We want to protect the roots of the remaining trees, as well as to prevent any further soil erosion. Suggestions?

—MICHIGAN

There are no simple post-operation remedies!

The trees that you want to save should be fertilized well in advance of winter and prior to stresses caused by nearby construction. This will promote root growth. Protect the area within the dripline of the tree with a special fence. Try to keep heavy equipment off of this area.

If that's not possible, consider using some plywood or similar material to prevent compaction. Areas that are already compacted can be aerified, radial trenched and mulch, or vertical mulched. Avoid scuffing or injuring roots and bark.

To protect the exposed or

cut roots from low temperatures, consider covering them with soil and/or mulch. Mulch should not be more than three to four inches deep. Don't pile mulch up on the tree trunk.

Valuable tree root systems may be further protected with some sort of thermal insulating product. Reports indicate variable results and it may not be practical in some situations.

To avoid winter erosion problems, it's important to conduct construction operations with minimum land exposure. The bare ground should be revegetated to a temporary or permanent cover to avoid erosion. In some situations where no immediate development will be done, seeding with turfgrass, ground covers like crown vetch or clover might be beneficial for erosion control in slopes as well as in other areas.

If it's too late for seeding, consider dormant seeding or mulching. If using mulch, make sure to use an additive to provide additional protection. Seeds should be properly covered with mulch such as straw, polymer-based products, or Penn-mulch. Erosion problems may be a major concern if there are mounds of soil or slopes at the construction site. Erosion control blankets and mats provide excellent protection on steep slopes. Some can be purchased with seed and fertilizer within the blanket or mat. **LM**

SEND YOUR QUESTIONS TO:

"Ask the Expert"
 Landscape Management
 7500 Old Oak Blvd.
 Cleveland, OH 44130

Please allow two to three months for an answer to appear in the magazine.

PENDULUM

When it comes to season-long control of crabgrass, goosegrass, oxalis, spurge and many other troublesome weeds, PENDULUM®



*Trademark, American Cyanamid Company.

herbicide gets down to business. No other preemergent turf herbicide can match its spectrum of weeds controlled and cost-effectiveness. • PENDULUM brand Pendimethalin also offers greater flexibility than ever before, with a complete preemergent product line that includes sprayable formulations, combination fertilizer products and now a 2% granular formulation. • When you consider cash rebates available to you from American Cyanamid, it's easy to see that PENDULUM really does mean business. Smart Business. • To learn more about the rebate offer or for the name of the PENDULUM distributor nearest you, call 1-800-545-9525, Ext. 931.



Agricultural Products Division
Specialty Products Department
One Campus Drive, Parsippany, NJ 07054-4492
© 1997

MEANS BUSINESS

1998

New England Regional Turfgrass Conference & Show

March 3-5, 1998
R.I. Convention Center, Providence

A Combined Six States Show...
Building Together for Tomorrow

Show & Conference Pass Includes

- Opening Reception
- Educational Sessions
- Show Reception
- Admission to Trade Show
- Keynote Speaker
- Luncheon Voucher(s)

Over 300 Turf Related Booths Await You...

Meet professionals on the cutting edge of turf management. See the latest in equipment, products and supplies. Join fellow lawn, golf, sports, landscape, municipal & other turf industry professionals.

Certification Credits

Pesticide Applicators Recertification Credits are offered for all New England states.

GCSAA CGCS Recertification CEU

1.0 CEU has been approved by the GCSAA for credit towards recertification.

Informative Presentations

- Golf Course Mgt. • Lawn/Landscape Care • Athletic Field & Municipal Turf Management • Machinery & Shop Maintenance

TRADE SHOW HOURS:

Tues., Mar. 3 • 4pm-7pm
Wed., Mar. 4 • 10:30am-2pm
• 4pm-6pm
Thurs., Mar. 5 • 10:30am-2pm

EDUCATIONAL SESSION HOURS:

Tues., Mar. 3 • 1pm-4pm
Opening Session & Keynote Speaker
Wed. & Thurs., Mar. 4 & 5
• 8:30am-11am • 2pm-4pm

Presented by:

The New England Regional Turfgrass Foundation
in cooperation with the University of Rhode Island
and the University of Massachusetts



Keynote Speaker
March 3rd
Jim Palmer
Hall of Fame pitcher
from the Baltimore Orioles

Watch your mail for your registration form
or call (401)848-0004

Circle 121

LANDSCAPE management

EDITORIAL STAFF

- Terence McIver **Editor-in-Chief** (440) 891-2709
E-mail: tmciver@advanstar.com
Ron Hall **Managing Editor** (440) 891-2636
E-mail: rhall@advanstar.com
Vernon Henry **Group Editor** (440) 826-2829
Lisa Lehman **Art Director** (440) 891-2785
Lisa Bodnar **Graphic Designer** (440) 891-3101

READER ADVISORY PANEL

- Jerry Coldiron **Boone Links / Lassing Pointe G.C.** Florence, Ky.
Larry Iorri **Down to Earth Landscaping** Wilmington, Del.
Rick Kier **Pro Scapes** Jamesville, NY
David Mellor **Milwaukee Brewers** Milwaukee, Wisc.

BUSINESS STAFF

- John D. Payne **Group Publisher** (440) 891-2786
E-mail: jpayne@advanstar.com
Brenda Dunlap **Administrative Coordinator** (440) 891-2734
Linda O'Hara **Senior Production Manager** (218) 723-9281
Karen Laszlo **Controller/Marketing Director** (440) 891-2705
Debi Harmer **Production Director** (218) 723-9325
Karen Edgerton **Circulation Manager** (218) 723-9280
Lynn Viele **Green Book Coordinator** (218) 723-9393

ADVERTISING OFFICES

- Headquarters** 7500 Old Oak Blvd.
Cleveland, OH 44130-3369
(440) 243-8100 Fax: (440) 891-2675
Patrick K. Toal **Eastern Sales Manager**
3101 Sawgrass Village Circle
Ponte Vedra Beach, FL 32082
(904) 280-4205 Fax: (904) 280-2122
E-mail: ptoal@advanstar.com
Tom Galligan **National Sales Manager**
3901 52nd Ave.
Kenosha, WI 53144-1830
(414) 653-9523 Fax: (414) 653-9524
E-mail: tgalligan@advanstar.com
John Kiesewetter **Western Sales Manager**
859 Willamette St.
Eugene, OR 97401
(541) 461-0022 Fax: (541) 461-0044
E-mail: jkiesewetter@advanstar.com
Bill Smith **Classified / Market Showcase** (440) 891-3162
Anthony Lavdas **Directory Sales** (800) 736-3665

MARKETING SERVICES

- Marcie Nagy** **Reprints (100 minimum)** (440) 891-2744
Mike Balzano **Circulation List Rental** (800) 225-4569, ext. 697
Advanstar Marketing **Microfiche/film Copies** (800) 225-4569, ext. 839
Chris Baxter **Subscriber/Customer Service**
(218) 723-9477 / (888) 527-7008
Debra Carlson **International Licensing** (218) 723-9518
Books, directories, back issues, photocopies
(800) 598-6008; (218) 723-9180



- Chairman and Chief Executive Officer** Robert L. Krakoff
Vice Chairman James M. Alic
VP, Business Development Skip Farber
VP/Finance, CFO and Secretary David W. Montgomery
VP, Strategic Planning Emma T. Lewis
Executive Vice Presidents Kevin J. Condon, William J. Cooke,
Alexander S. DeBarr, Brian Langille,
Glenn A. Rogers
Treasurer & Controller Adele D. Hartwick

YOU ARE ABOUT TO ENTER THE NEW AGE OF WEED CONTROL!

The science of controlling broadleaf weeds in turfgrass just took a giant leap into the future. Introducing **Millennium™ Ultra**, **Cool Power™** and **Horsepower™** from Riverdale.

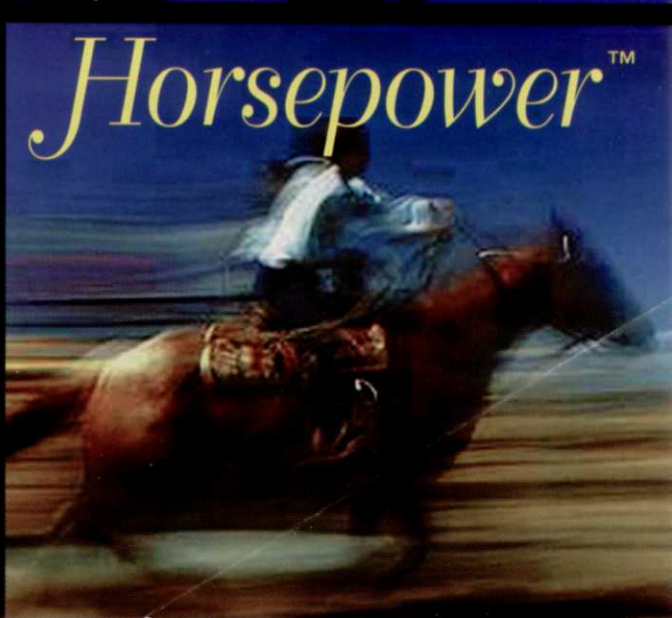
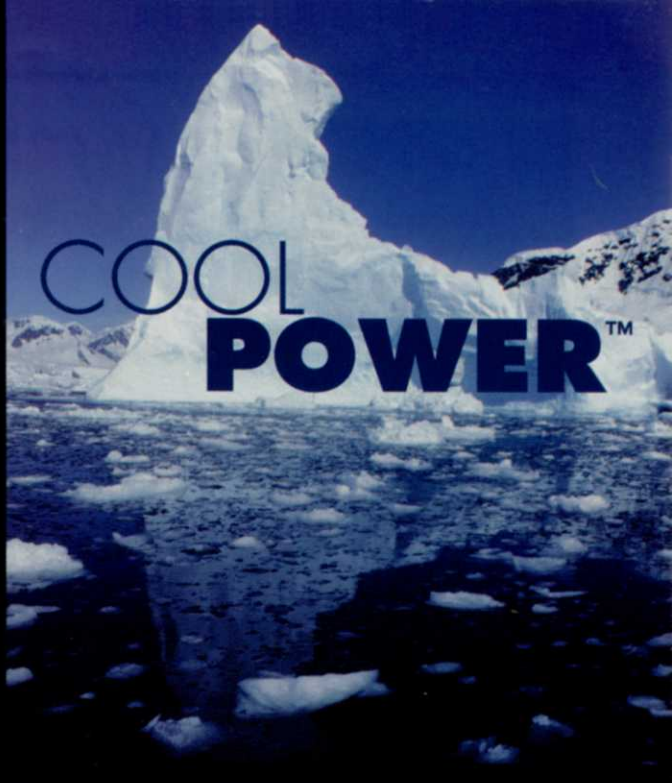
By combining the premium, broad spectrum performance of DowElanco's triclopyr and clopyralid chemistry with the fast action of phenoxyes and effectiveness of dicamba, Riverdale has created truly unique, first of their kind, premium broadleaf weed control products.

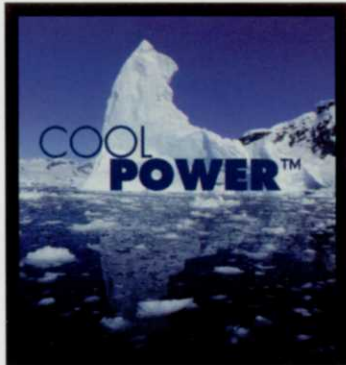
CHOOSE YOUR WEAPON:

Cool Power™ Ester formulation of MCPA, triclopyr and dicamba for maximum control of weeds under cool weather conditions.

Millennium™ Ultra High performance weed control with a premium product containing 2, 4-D, clopyralid and dicamba. Improved efficacy on hard-to-kill weeds.

Horsepower™ Amine formulation containing MCPA, triclopyr and dicamba for highly effective weed control in 2, 4-D free applications.





Winter annual broadleaf weed control in dormant warm season turf and Round 1 weed control during cool temperatures has always been trying. Now, **Cool Power™** makes easy work of those problem conditions. Increased plant uptake of a scientifically proven ester formulation makes



Cool Power™ the choice for cool weather applications.

As temperatures increase, conditions become more favorable for weed growth and control. Switch



to amine formulations for improved economics. But don't jeopardize customer satisfaction with cheap mixes. Bring out the big guns and knock those weeds out completely. **Millennium™Ultra** gives you the best weed control available combined with the rapid curling action of 2, 4-D for a fast visual response.

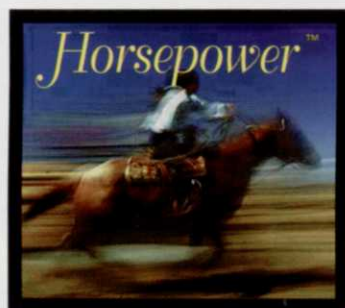


Or, for 2, 4-D free programs, **Horsepower™** gives the highly effective, broad spectrum control your customers demand.



So, don't treat your weeds with the same old products you always have and spend the rest of the season talking about how dissatisfied

you are with their performance. Leap into the new age of weed control and get the satisfaction you demand.



BRINGING THE FUTURE TO YOU, TODAY!

Riverdale

425 West 194th Street • Glenwood, IL 60425-1584 • phone 800.345.3330 • fax 708.754.0314

LANDSCAPE management

A proud supporter of these green industry professional organizations:



Associated Landscape Contractors of America
150 Elden Street, Suite 270, Herndon, VA 20170
(703) 736-9666; <http://www.alca.org>



American Nursery & Landscape Association
1250 I St. NW, Suite 500, Washington, DC 20005
(202) 789-2900



Golf Course Superintendents Assn. of America
1421 Research Park Dr.
Lawrence, KS 66049-3859
(913) 841-2240; <http://www.gcsaa.org>



Independent Turf and Ornamental Distributors Association
1217 Wayburn
Grosse Pointe Park, MI 48230
(313) 331-7739

International Turfgrass Society
Crop & Soil Environmental Sciences, VPI-SU,
Blacksburg, VA 24061-0403
(561) 996-3062



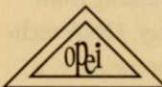
National Arborist Association
The Meeting Place Mall, P.O. Box 1094,
Amherst, NH 03031-1094
(603) 673-3311; <http://www.natlarb.com>



National Golf Foundation
1150 South U.S. Highway One, Jupiter, FL 33477
(407) 744-6006



Ohio Turfgrass Foundation
P.O. Box 14824, Columbus, OH 43214
(614) 261-6750



The Outdoor Power Equipment Institute
341 South Patrick St.
Old Town Alexandria, Va. 22314
(703) 549-7600; <http://opei.mow.org>



Professional Grounds Management Society
120 Cockeysville Rd., Suite 104,
Hunt Valley, MD 21031
(410) 584-9754



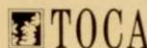
Professional Lawn Care Association of America
1000 Johnson Ferry Rd., NE, Suite C-135,
Marietta, GA 30068-2112
(770) 977-5222; <http://www.plcaa.org>



Responsible Industry for a Sound Environment
1156 15th St. NW, Suite 400,
Washington, DC 20005
(202) 872-3860



Sports Turf Managers Association
1375 Rolling Hills Loop, Council Bluffs, IA 51503-8552
(712) 366-2669; (800) 323-3875;
<http://www.aip.com/stma>



Turf and Ornamental Communicators Association
P.O. Box 156, New Prague, MN 56071
(612) 758-5811

THE ONE, THE ONLY, THE ORIGINAL.



Designed to fit: BUNTON, KEES, EXMARK,
RANSOMES/BOBCAT AND SNAPPER
(with belt driven variable transmissions).

IN 1972, BUNTON WAS THE FIRST COMPANY TO EVER BENEFIT FROM DALTON GEAR'S ORIGINAL VARIABLE SPEED GEARBOX!

Now, over 25 years later, Dalton Gear produces "each-and-every" gearbox with the same quality as those first OEM'S in 1972! Our client list has grown to include RANSOMES/BOBCAT, KEES, EXMARK and SNAPPER. There have been a few imitators, but none have ever even come close to Dalton's quality. We know Commercial Landscaping, Parks & Recreation, Cemeteries, and Golf & Country Clubs need service on their machines, no matter what make or model, and, "they-need-it-now!" Also, they need long lasting, quality, top-of-the-line replacement parts, constructed of the finest metals and special alloys. An "open-space" on the gearbox shelf doesn't get the job done. ORDER TODAY and rely on Dalton Gear. As an added bonus, we are throwing in factory recommended gearbox lube, FREE with each unit!

Use only... **THE ONE,
THE ONLY,
THE ORIGINAL.**

only
\$125⁰⁰ each
(1-3 pieces + shipping/handling)
\$115⁰⁰ each
(4-8 pieces + shipping/handling)



ORDER DIRECT **800-328-7485**
212 Colfax Avenue. No., Minneapolis, MN 55405

Circle 109

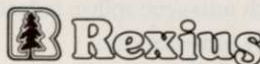
The Ultimate Wheelbarrow



No more wheelbarrows! Add speed, efficiency, productivity and profit to your landscaping and erosion control projects with an

Express Blower

- ▶ Blows organic mulch with a range of up to 350 ft with a flow rate of up to 55 cu. yds. per hour.
- ▶ One man operates the system by remote control for "on demand" adjustments in flow rate.
- ▶ Features automatic feed & dust suppression systems (patents pending).



800-285-7227
For product information:
expressblower.com

Circle 131

Genetic turf research needs support

By RON HALL/ Managing Editor
Genetically engineered turfgrass is coming, but when it will become commercially available isn't clear. What's clear is that transgenic research in turfgrass lags far behind similar research in food



Dr. Peter M. Gresshoff says U.S. turf industry must begin supporting genetic research.

and fiber, said Dr. Peter M. Gresshoff, plant molecular geneticist at the University of Tennessee.

The turfgrass industry has gotten no financial support from federal or state agencies for research in gene splicing, claimed Gresshoff. It will have to do more on its own to advance the knowledge of the genetic material within the many species and varieties of turfgrass.

"We're in a situation of cultivar development which is equivalent to the Babylonians 3000 years ago who walked around the fields (and said), 'Oh, here's a good plant.

Let's pick the seeds of this and see how well it grows,'" said the scientist at the Tennessee Turfgrass Conference this past January.

The future is here

That's not the case in agriculture.

In fact, chances are that you're eating genetically engineered food. Or, perhaps, wearing clothing made of transgenic fiber. Here's a short list of genetically altered crops being grown (or soon to be grown) commercially: corn, cotton, potato, soybean, squash, tomato, and canola.

These plants exhibit the characteristics of genes isolated from other plants or animals. These genes are inserted into the DNA of host plants, for instance, to make them resistant to certain diseases or insect pests. Or to make them more efficient users of nitrogen or water. The list of crops and of the number of genes are expanding, more or less in order of the economic importance of each crop.

Research into gene splice, indeed, is accelerating. Rapidly increasing are:

- ▶ the applications for genetic engineering,

- ▶ the number of organisms being "improved",
- ▶ the rapidity with which engineered products can be brought to the marketplace.

A Wisconsin company, for instance, "piggy-backed" seven new properties into a new corn variety in just 1½ years. The process would have taken 10 to 12 years using traditional plant breeding, said Gresshoff.

Big hurdles

While researchers at Rutgers and Michigan State University have reportedly engineered a bentgrass resistant to the herbicide Finale, the industry, in general, faces big hurdles in developing turfgrasses with improved characteristics through gene splicing. Not the least of these challenges is the turfgrass itself, both the number of species (and people or companies championing individual species) and the fact that grasses—like other cereals—have lots of DNA, said Gresshoff.

"Right now there is not a single (genetic) map for any turfgrass. We're not even close," he added. "We first have to get the map to understand where the genes are functioning in the turfgrass."

While new varieties of turfgrass arising from gene splicing appear to be years away, DNA technology is being used in turfgrass. For instance, a gene "marker" technology can be used as a diagnostic tool.

"DNA fingerprinting is a reality right now," said Gresshoff. "We can see if something is a legal Tifway 419 variety or not. We can check production, identify contamination."

Gresshoff urged the U.S. green industry to support genetic turfgrass research at the university level. Otherwise, he hinted, it could be looking to other countries or huge multi-national companies for the technology to produce the next generation of improved varieties.

Oldest college track to be renovated

Historic Edwards Stadium at the University of California—the country's oldest pure collegiate track facility—will be renovated soon as part of a \$3 million project.

The stadium's existing track and infield areas will be reshaped and resurfaced to accommodate both track and soccer competition. U.Cal officials feel the upgrade will

make Edwards an attractive site for future NCAA and international track and soccer events.

CMX Group, Inc., of Phoenix, Ariz., is handling the project with the Cal Athletic Department as primary consultant and engineer.

CMX recently handled the conversion of UCal's Memorial Stadium from arti-



ficial turf to natural grass.

For the Memorial Stadium project, CMX removed the field's 2-1/2-foot crown; installed Kentucky Bluegrass sod atop a specially-designed, sand-based, gravity-flow drainage system with fully-automated field irrigation technology.

"We had some interesting sub-surface issues," says CMX President Mike Lloyd.

"We had to avoid Strawberry Creek, which flows di-

Built in 1923 overlooking San Francisco, UCal's Memorial Stadium went from grass to artificial, and back to grass again.

rectly under the stadium. During construction, we also encountered natural underground springs, which had to be intercepted, and some unstable soil which had to be treated."

The field at Edwards Stadium will feature a natural grass field system similar to that at Memorial.



CMX Group designed, oversaw the 5-month Memorial Stadium construction project and installation of new Kentucky bluegrass field.

Snow removal symposium

The Snow & Ice Management Association holds a "Snow & Ice Symposium", May 7-9, at the Airport Marriott, Pittsburgh, Pa. Topics include pricing, weather reporting and insurance. Cost is \$295 for members, \$365 for non-members. Call 814/456-9550.

Penn turf flies high

Three ounces of turfseed is going with Dr. James Pawelczyk when he blasts off in the Space Shuttle Columbia on April 2. Pawelczyk, is an assistant professor of physiology and kinesiology at Penn State University. The grass seed is from experimental lines of Kentucky bluegrass and perennial ryegrass developed at the university

Dr. David R. Huff, assistant professor of turfgrass and genetics at Penn State, selected the seed types. He said genetically identical seeds will be kept on Earth to compare with the shuttle seeds. Huff says this is the first time turfseed has flown in space.

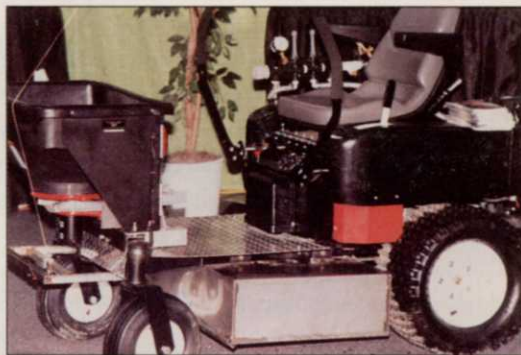
At the completion of the 16-day shuttle mission the seed will be planted, and one square foot of the resultant "space turf" will be installed at each of the 24 campuses in the Penn State system.

Students Charles C. Eagle, Michael S. Bell, Margaret M. Bloch and Michael A. Roofner suggested the turfseed which won over other suggestions such as taking along a cardboard Joe Paterno and a football.

WHAT'S great IN '98?

*The editors at LANDSCAPE
MANAGEMENT pick some new
products or ideas that will get
some attention in the Green
Industry this year.*

Motorized turf applica-
tion unit from S.N.G.
makes big properties
easy to treat.



The new year brings a host of new Green Industry products and services. We've got more than a few to show you that may be of service.

Some of these products or services will catch on and become immediately valuable to segments of the industry. Past examples include the DTN Weather Monitoring System which quickly became indispensable with golf course superintendents and athletic field managers. Or the Dingo Digger line of construction equipment introduced into the United States a couple of years ago.

Recent chemical introductions that became industry-wide hits include Merit insecticide from Bayer, Primo growth regulator from Ciba, and Heritage fungicide from Zeneca. Other exciting new chemistries that will greatly aid turf professionals are the insecticides Conserve from Dow AgroSciences and Mach 2 from Rohmid.

Unfortunately, LANDSCAPE MANAGEMENT is going to press with this issue just before the 1998 GCSAA Show. Otherwise we'd show you the new products unveiled there. Look for them in our March issue.

Check out the following products and services. We're betting some of them will become helpful to many of you in 1998.

An LCO's dream

The Lawn Cad 2000 is a zero-turn-radius, motorized (17 hp Kohler engine) spreader/sprayer that makes chemical applications a snap on larger residential properties, commercial sites and ball fields. It's built by S.N.G. Equipment in Plain City, Ohio, an outfit that knows the application business since it uses these same units daily. The Lawn Cad 2000 can fit through a 40-inch gate, can spray either from the front or a boom unit on the rear; it can hold and spread 100 pounds of granular material; and it has a spray wand for making spot treatments. An owner/operator can spray an acre in about 12 minutes, a football field in about 17 minutes. One person can treat 500,000 sq. ft. in a day on one of these stainless steel/aluminum babies if he sets his mind to it, claims S.N.G. Call 614/873-3719

New non-restricted fumigant

Basamid granular soil fumigant from BASF Ag Products is a new way to sterilize soil for new or renovated golf course greens. It's significant because the

fumigant methyl bromide may be removed from the marketplace by 2000.

Basamid is neither a liquid nor a gas; it's a white granular. Blended with a complete soil mix before construction, Basamid controls weeds, nematodes and soil diseases, claims BASF. Moisture in the soil converts Basamid into active substances that diffuse as a gas, destroying fungi, bacteria, nematodes and soil pests.

Keep a level head

At first glance you might think a seat-leveling system is not such a big deal. But if you do any cutting on a slope, you'll be glad you've got one on your mower. Burkes Trading International in Lawrence, MA, (508/689-9330) is the U.S. distributor of this electrically controlled unit that was developed in Sweden. The seat is designed to keep an operator level to either 10 to 15 degrees. It may begin showing up on some production U.S. equipment soon.

Creeping-bluegrass available

Peterson Seed, Savage, MN, offers its Peterson's Creeping-Bluegrass for primary use on golf course greens. Dr. Donald B. White and the University of Minnesota developed this grass from *Poa annua*. But this grass, claims Peterson, is dark green, forms a uniform and dense turf (no grain), thrives at mowing lengths of 1/8 inch, is resistant to many diseases, winter hardy and has a stoloniferous spreading habit. The first release of creeping-bluegrass has been named DW-184 with limited supplies available. Call 800/328-5898.

Millennium arrives

Steve Tubbs at Turf Merchants, Tangent, OR, says limited quantities of Millennium, its first 4th-generation turf-type tall fescue, is available. Full production is set for this year. He describes Millennium as dark green, with medium-fine leaves and medium density. TMI has also released Paragon, a new perennial ryegrass seed. Both varieties were developed at Rutgers. TMI's number is 503/227-5547.

Useful labor 'product'

Consider this next item a "product" to improve labor efficiency and labor relations. Jennifer Thomas, just over a year ago, started Spanish Training Services, Inc., a service to teach U.S. employers and managers some practical Spanish and also to help them become aware of cultural differences in the workplace. Thomas is an effective teacher and communicator and she focuses her program on the specific green in-

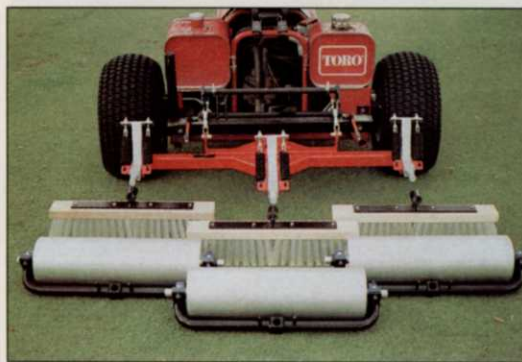


dustry, work-environment vocabulary. Because of the growing importance of Hispanic workers in the green industry, Thomas has also developed a Spanish Training home study course for green industry managers. It should be available in March. Contact Jennifer at 847/491-0099 or 800/491-0391.

Roll, spike or drag

Alpine Engineering's Roller/Spiker/Drag Brush System can roll 18 average-size greens in about 2 hours, or spike an average-size green in five minutes with over 300 slices per foot. The drag brush attachment—down pressure controlled by the operator—can be used to lightly lift grass blades prior to mow-

Jennifer Thomas (standing) helps U.S. Green Industry employers to break the language barrier and work more effectively with their Hispanic employees.



Alpine's single unit can roll, spike or drag brush a golf green.

ing to help eliminate grain, or to drag in the heaviest top dressing. Call Alpine in Wyoming at 307/654-7428 for more details.

Franchise opportunity

Castart by NatureScapes, headquartered in Tucson, offers franchises for selling and marketing Castart's building blocks components for rock water-

falls, streams, pools, ponds and spas. Castart's building block components are three times stronger and more flexible than concrete, the company claims. "For the right candidate, the total investment can be as low as \$12,800-\$25,000, and that includes an exclusive area of approximately 340,000 people," says president David Weinert. Call franchise vp Donald Gompers Isaacs at 520/623-8858 or 800/871-8838.

For tree health

Imisol is a new micro-injection product from The Mauget Company, Arcadia, CA. It contains Imicide insecticide and Fungisol fungicide for single-treatment, targeted control for both tree insects and diseases. Imicide is a systemic insecticide for many in-

These components are manmade, but they look real. Castart offers franchises for installations.



sects; Fungisol is fungicide for anthracnose, many cankers, fusarium and verticillium wilts, oak wilt, and dieback of birch, palm and walnut. You get both in Imisol. For a distributor near you, call J.J. Mauget Company at 626/444-1057 or 800/873-3779.

Dump body "for all seasons"

Henderson Manufacturing's combination spreader/dump body is designed to be a year around worker. Its "Munibody" design incorporates an ellipti-



cal side-to-floor profile for greater load capacity with a lower center of gravity. It has a built-in reversible conveyor system capable of moving material to the tailgate or forward to either side for spreading or shoulder work. This gives snow crews complete flexibility, and the body can also haul anything a standard dump body can, says the company which can be reached at 319/927-2828.

Henderson Manufacturing' spreader/dump body features reversible conveyor system to move material more efficiently.

Tree decay detector

The Arborsonic Decay Detector is a battery-powered instrument, weighing just three pounds that makes large-scale surveys and selection of trees on development sites easier and more accurate. It reveals decay not apparent from external inspections and eliminates the need for drilling. Contact American Arborist Supplies, Inc., West Chester, PA, at 800/441-8381.

Monitoring service vehicles

Lots of trucks to keep track of? Consider Teletrac, a land-based vehicle location and information system. Based in Kansas City, MO, Teletrac specializes in wireless remote fleet management and two-way data communications for commercial fleet management. The company says its services can improve your fleet management and speed customer service—for a price of course. Call 816/474-0055. **LM**



Move to Kubota Country

Move to Kubota country and you'll find versatility, durability and operator comfort. The Kubota B-Series (13 to 18 PTO horsepower) tractors are compact to fit in tight places and powerful to get lots of jobs done. Kubota performance matched implements include rotary tillers, front loaders, mid and rear mount mowers, boxscrapers and snowblower.

Need more power? Move up to the innovative Grand L-Series (25 to 37 PTO horsepower). Hydrostatic steering, shuttle transmission with shift-on-the-go provides ease of operation. Kubota's exclusive optional Glideshift transmission has clutchless operation through all eight speeds, forward and



reverse. These tractors are smooth and quiet, with Kubota's E-TVCS engine which ensures clean emissions while providing high torque rise. Get one with an integral cab with heat and air-

conditioning for year 'round comfort.

Visit your Kubota dealer and find out how to make your move - to Kubota country!



For more information, please write to:

Kubota®

KUBOTA TRACTOR CORPORATION

P.O. Box 2992, Dept. LM

Torrance, CA 90509-2992

or call Toll Free 1-888-4 KUBOTA ext. 403

(1-800-458-2682 ext. 403)

Financing available through Kubota Credit Corporation



YOU THE MAN.



ALWAYS IN DEMAND?

IT'S A PAGER/CELL PHONE/2-WAY RADIO ALL IN ONE.

With Nextel, you can carry less and get more done. That's because our Motorola® digital cellular phones include text/numeric paging plus a feature that only Nextel has – Nextel Direct Connect.™ This works like a digital two-way radio so you can instantly contact a person or a group with the push of a button. No voice mail. No waiting. Plus, with Nextel Direct Connect you can talk as much as you want for a fraction of the cost of cellular. So go ahead – you the man – make the call. **NEXTEL**™

YOU'VE NEVER USED A PHONE LIKE THIS BEFORE.™ CALL 1.800.NEXTEL9.

©1998 Nextel Communications. All rights reserved. Nextel, the Nextel logo, Nextel Direct Connect and You've Never Used A Phone Like This Before. are trademarks and/or servicemarks of Nextel Communications, Inc. *Motorola is a registered trademark of Motorola, Inc. www.nextel.com



Circle No. 122 on Reader Inquiry Card



The Turf Manager's Guide
to Insect Identification



sponsored by:
MACH 2 TURF INSECTICIDE

INSECT IDENTIFICATION GUIDE

INTRODUCTION:

Active insect pest infestations on managed turfgrass sites—from championship golf courses to low maintenance park lands—pose a persistent and difficult challenge to professional turf and grounds managers. Successful managers must combine a thorough working knowledge of the environment of their managed sites and the biology of the grass species with a



To accurately diagnose turfgrass damage, it is important to have a thorough understanding of multiple ways symptoms can be produced.

good understanding of insect pest distribution, insect life cycles, identification characteristics, site and plant symptomology, correct scouting techniques, and appropriate cultural and chemical control strategies. Given this daunting task, LANDSCAPE MANAGEMENT magazine and Mach 2 Turf Insecticide have produced this guide to managing a select number of turfgrass insect pests for use by professional turf and grounds managers. We believe that good turfgrass management, now and in the future, requires a combined and ongoing effort by all involved - managers, suppliers, and information providers. This LANDSCAPE MANAGEMENT guide provides photographs and descriptions of the most common Coleoptera and Lepidoptera pests including Japanese beetle grubs, sod webworms, cutworms, chafers, armyworms and many more.

Recognizing Insect Damage in Turf

Perhaps the most difficult task in correctly diagnosing damage caused by insect pest activity at

turfgrass sites is the process of differentiating site and plant symptoms produced by insects from those produced by either turfgrass diseases or abiotic causes (temperature and moisture extremes, site usage, or site management activities). Because many of the site and plant symptoms generated by non-insect activities closely resemble those caused by insects, the best way to make an accurate diagnosis of insect damage is to have a thorough understanding of the multiple ways these similar symptoms can be produced and how to use the keys for differentiating between them.

For managers with many long years of experience at one facility, the art of correctly diagnosing insect damage often comes as second nature, but to other managers who are often faced with multiple grass species at different sites under varying conditions, achieving a correct diagnosis is a matter of consistently applying a protocol designed to narrow down the possibilities.

This protocol will vary somewhat by site environment or region, species managed, management style, or site usage. The following five questions can help managers differentiate the causes of damage at turfgrass sites.

- 1) Do the symptoms have a regular or definable pattern, i.e., stripes, circles, tracks, etc.? If so, then look at mechanical activity, such as mowing, traffic, drainage, etc., as a possible cause.
- 2) Does the site show signs of animal activity or damage, such as birds feeding or turf torn up by skunks or raccoons? If so, then look for insect activity in the damaged areas.
- 3) Did the symptoms appear after a prolonged period of warm temperatures *and* high humidity? If so, then consider disease activity.
- 4) Does an examination of plants in affected areas not show any identifiable insect specimens or leaf, crown, or root lesions or disruptions? If this is the case, consider the sites' other management practices, such as misapplication of fertilizers or pesticides, as the possible cause.
- 5) Does examination of the affected plants show signs of feeding activity, such as damaged leaves, crowns, or roots or evidence of chewed plant material (frass) at the base of plants? If so, then, insects are the likely cause.

INSECT IDENTIFICATION GUIDE

Scouting for pests

Managers who are skillful at differentiating causes of turf damage should use those skills in a structured format known as pest scouting to provide early, site and pest specific data for making management decisions that are appropriate, accurate, and require the minimum input of material and labor needed to accomplish the goal.

Pest scouting should be done using a defined system on a regular basis by designated personnel.

For some managers, pest scouting can be a formalized structure that acts as the foundation for the use of data intensive Integrated Pest Management (IPM) strategies, while for others, scouting can be used as a viable alternative to traditional preventive pesticide applications based on regional or historic factors.

Either way, pest scouting should be done using a defined system on a regular basis by designated personnel. How the process is established is up to the individual preferences of the manager involved, but any successful scouting must include the following to be effective:

- ▶ accurate identification of pests involved;
- ▶ some means of quantifying numbers of pests found;
- ▶ some way of locating areas of pest involvement.

How these principles are applied for each pest species involved will vary. Some will require the use of light traps, sweep nets, hand lens, hand trowels, sod lifter, cup cutter, good observational powers, scouting during defined periods or on a weekly or biweekly basis, soap or insecticidal flushes, or written or graphed results. All three principles are required to provide managers with a consistent foundation to make the best control decision for their site, their site usage, their management style and, not the least, their operating budget.

Tips for accurate insect identification

Historically, when broad-spectrum, season-long



Knowing which species of insect is present and how that insect's biology relates to the grass species is critical for safe use of control materials.

control materials where available, knowing the species of insect involved in turf damage and how the insect's life cycle facilitated their control was not particularly important, since the nature and toxicity of the materials used blurred those distinctions. Today, knowing which species of insect is present and how that insect's biology relates to the grass species managed and the sites' usage is critical for the safe use of control materials in the current climate of increased environmental awareness and responsibility.

Accurate field identification of an insect species requires the acquisition of specimens; either the immature (larval) or the adult stage, or both. In many cases, several specimens are needed for an accurate identification. Regional or local land-grant universities have cooperative extension services or entomology departments that can help with identification. If you plan to use outside experts, proper preservation of samples is very important. Store collected samples using either shellac thinner or rubbing alcohol as a preservative solution.

Do not use just the visual examples provided in this guide as the sole means of insect identification. The more closely the other factors described in this guide relate to your site, its environment, and the known species distribution, the more accurate will be your insect pest identification.

CONTENTS

Surface feeders

Fall Armyworm	R5
Black Cutworm	R6
Bluegrass Sod Webworm, Large Sod Webworm	R7
Tropical Sod Webworm	R8

Surface/Soil feeders

Annual Bluegrass Weevil	R9
Billbug	R10

Soil feeders

Asiatic Garden Beetle	R11
Black Turfgrass Ataenius	R14
European Chafer	R15
Northern & Southern Masked Chafer	R16
Green June Beetle	R17
Japanese Beetle	R18
May/June Beetle	R19
Oriental Beetle	R20
Turfgrass entomology	R21
MACH 2	R22
Summary	R24

INSECT IDENTIFICATION GUIDE

MACH 2 Turf Insecticide is a new, unique tool in the professional turf and grounds managers' ongoing challenge to successfully manage insect pests.

Unlike most of the currently available turf insect management products, which are characterized by high toxicity, MACH 2 belongs to a new class of chemistry called the diacylhydrazines that offer low toxicity and high efficacy. This new class displays excellent control of grubs, sod webworms, cutworms, and armyworms.

How MACH 2 works

MACH 2 belongs to a new class of chemi-

cal compounds called molt accelerating compounds which interfere with the normal molting process of targeted pests. It targets the insect's own body chemistry in a unique and highly effective way. MACH 2 mimics hormones that cause the insect to molt prematurely, disrupting the natural metamorphosis

process. This causes the target insect to stop feeding shortly after it has been ingested. Later, the insect dies beneath the turfgrass surface. Although death may take up to three weeks, the treated insect will do no further damage.

MACH 2 offers applicators increased flexibility

MACH 2 Turf Insecticides' long residual combined with its systemic action offer applicators a highly effective control material with an expanded window of application.

MACH 2 can be applied any time from before eggs are deposited through the 1 - 2 instar growth stage of grubs and still provide 90% + control. University tests have shown that both the sprayable formulation (2SC) and the granular formulation (1.5G) are equally effective whether they are watered in immediately or not. This tremendous flexibility allows applicators to schedule treatments at times when conditions are favorable or when workloads permit and be assured of the same high levels of targeted insect control, whether or not rainfall is in the forecast.

MACH 2 Effect of Application Timing on Performance

% CONTROL

Treatment	Pre-Egg	Egg Lay to 1 Instar	1-2 Instar
MACH 2 (2SC)	100	99	93

3 Trials: OH, MA, GA (1995) Japanese Beetle

cal compounds called molt accelerating compounds which interfere with the normal molting process of targeted pests. It targets the insect's own body chemistry in a unique and highly effective way. MACH 2 mimics hormones that cause the insect to molt prematurely, disrupting the natural metamorphosis

SURFACE FEEDERS

FALL ARMYWORM (FAW)

scientific name: *Spodoptera frugiperda*

Similar species: Armyworm (AW)

FIELD KEYS

Hosts: bermudagrass, bluegrass, bentgrass, ryegrass, fescues

Site symptoms: Small to larger areas of sunken or thinned turf that gets larger with time. Turf often has flocks of feeding birds.

Plant symptoms: The undersides of leaves are skeletonized by small 1st instar feeding with full grown larval feeding on all above-ground plant parts. Frequently larva leave partly eaten plant parts scattered on soil or thatch surface.

Site keys: Low, wet or transitionally shaded areas.



LARVA (FAW)



ADULT (AW)

SPECIMEN ID

Fully grown FAW larvae can reach 2 inches long with four small black spots on the top of each segment and dark stripes down each side. Adults are gray brown moths with 1-inch-long, narrow, football-shaped bodies and 1½ inch wing spans. The forewings are dull gray mottled with darker spots and the hindwings are yellow to white at the edges and almost translucent in the centers.

SCOUTING TIPS

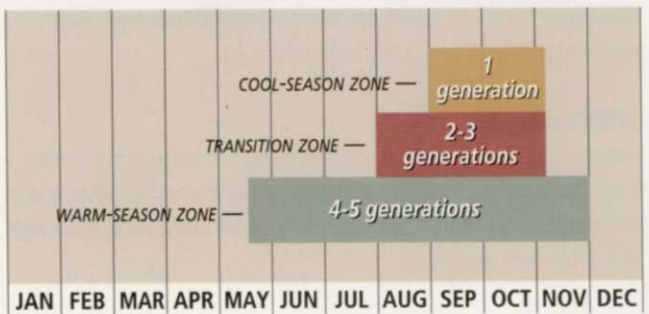
Although FAWs can occasionally be found as far north as the Canadian border, they are primarily a pest of the middle and lower portions of the country, where they can be abundant. FAWs are very cold sensitive so they annually migrate to northern regions by flying into weather fronts sweeping up from warmer regions. The moths frequently lay egg masses on trees and other vertical surfaces, with the newly-hatched larvae lowering themselves down to the turf on silken strands. FAWs have short life cycles of as little as 3-4 weeks, so warmer regions can have multiple generations per year.

CONTROL STRATEGIES

Cultural: FAWs have lots of natural predators, ranging from parasites to birds. Larval populations can be monitored using soap or insecticide flushes or by collecting and quantifying when larva feed at night. Minor infestations late in the year often do not require treatment.

Chemical: If FAWs are a consistent pest try to correlate data on population numbers with the time of year and observed damage when making control decisions. Tall cut turf can tolerate a higher population than can shorter cut sites. FAWs rarely damage large areas of turf. Their larvae are often localized; the damaged turf can recover quickly if spot treatments of insecticides like MACH 2 are used.

SPECIES ACTIVITY, BIOLOGY & LIFE CYCLE



Growth stages: egg - grub (several instars)* - pupa - adult

* - treatable stages

Life cycle: 1 year life cycle (multiple generations in warmer regions)

Sequence: adult - egg - larva - pupa - adult

DISTRIBUTION



Indigenous states

SURFACE FEEDERS

BLACK CUTWORM (BCW)

aka: Greasy cutworm

scientific name: *Agrotis ipsilon*

Similar species: Variegated cutworm,
Bronzed cutworm

FIELD KEYS

Hosts: bentgrass, ryegrass, and most other grasses

Site symptoms: Small roughly circular areas of eaten turf often surrounding an aeration hole or tunnel or cavity dug in soil or thatch.

Plant symptoms: Larvae eat plants at or near the soil line.

Site keys: A problem pest on golf greens and tees and other highly maintained bentgrass locations.

SPECIMEN ID

Larvae range from ¼ inch translucent first instars to large, 2-inch long, dull gray to black striped caterpillars that will roll into a coil when disturbed. Adults are gray moths with black wing markings and a 1½ inch wing span.

SCOUTING TIPS

Look for small circular or depressed areas around aeration holes or shallow dug tunnels in soil or thatch. Mature larvae are night feeders that can be seen with a light or can be dislodged from their holes or tunnels during daylight with a soap or insecticidal flush. BCWs can produce from 2 to 6 generations per year depending on the region. Look for active larger larvae feeding on turf at night. Monitor larval populations with flushes and be aware that BCW is a pest on many agriculture crops so reinfestation can occur rapidly. Look for adult females feeding on neighboring flowering shrubs or trees at night.

CONTROL STRATEGIES

Cultural: If BCWs are using aeration holes as hiding places, delay aeration practices to less favorable periods after active larval growth stages or try backfilling holes with topdressing.

Chemical: In most areas, where BCWs are a consistent problem in turf, consider beginning control applications when concentrations of larger immatures reach one per three square feet. Use a soap flush to monitor for larvae every week. Treat with MACH 2 as soon as several small larvae are found. On golf courses, also treat 15-30 feet around greens and tees to prevent reinvasion. Resample in 40-50 days.



SPECIES ACTIVITY, BIOLOGY & LIFE CYCLE



Growth stages: egg - caterpillar (several instars)* - pupa - adult
* - treatable stages

Life cycle: 1 year cycle (multiple generations)

Sequence: larva - adult - egg - pupa - adult - egg - larva

DISTRIBUTION



SURFACE FEEDERS

BLUEGRASS SOD WEBWORM (BSWW)

LARGER SOD WEBWORM (LSWW)

aka: Lawn Moth, Snout Moth

scientific names: *Parapediasia teterrella*,
Pediasia trisecta

Similar species: Additional members of the cool season SWW species - Corn Root Sod Webworm, Sliver Striped Sod Webworm, Stripped Sod Webworm, Vagabond Sod Webworm



FIELD KEYS

Hosts: Bluegrass, fine fescues, bentgrass, ryegrass

Site symptoms: Small areas of thinning turf turn off color and increase in size daily. These smaller patches coalesce into larger areas of thinning, brown turf. Birds feed on affected areas leaving peck holes and small gray to tan moths can be seen flying low over turf at dusk.

Plant symptoms: Above-ground plant structures show damage from insect feeding activities and frass or green fecal pellets can be found near the centers of smaller damaged areas.

Site keys: Sunny to transitionally shaded well-managed sites that tend to be on the dry side.

SPECIMEN ID

Immatures are gray, green, or tan segmented worms with black spots on their bodies, tan to black heads, and range from 1/2 to 1-1/4 inch long when fully grown. Adults are small gray to tan 1/2 to 1-inch long moths with 3/8 to 1-3/8 inch wing spans and have readily visible snoutlike projections from their heads.

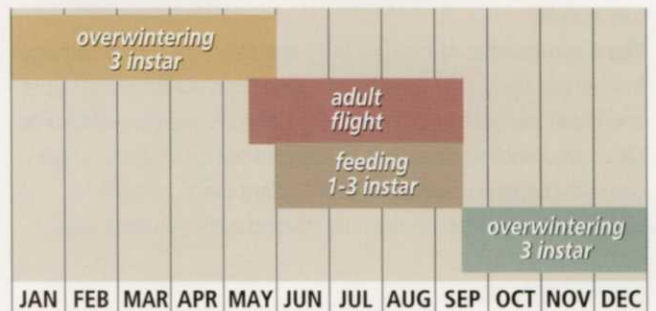
SCOUTING TIPS

Although the presence of adults flying low in a characteristic zigzag pattern when disturbed or at dusk is definitive, it may not correlate to treatable larval populations. Once adults have been seen, monitor larval populations with soap or insecticidal flushes beginning about two weeks after peak adult activity. Turf can vary widely in its ability to tolerate higher populations of SWWs, but heat or moisture-stressed sites almost always suffer greater damage. Since grasses are SWW's primary food source and their life cycles are quite short, small populations can rapidly increase over several generations to cause substantial damage.

CONTROL STRATEGIES

Cultural: Manage turf for vigorous growth. Overseed or renovate damaged areas with high-endophyte ryegrass or tall fescue varieties. Small adult populations late in the year usually do not require treatment, but should be monitored the following spring.

SPECIES ACTIVITY, BIOLOGY & LIFE CYCLE



Growth stages: egg - larva (up to ten instars)* - pupa - adult
* - treatable stages

Life cycle: 1 year life cycle (multiple generations)

Sequence: larva - pupa - adult - egg - larva

DISTRIBUTION



Chemical: Where scouting is ongoing, correlate larval population data with observed damage to develop site specific treatment thresholds. If this information is not available, consider control applications once damage has been observed or when populations reach 2-15 larvae per square yard (9 sq ft).

SURFACE FEEDERS

TROPICAL SOD WEBWORM (TSWW)

scientific name: *Herpetogramma phaeopteralis*

Similar species: Subterranean Sod Webworm

FIELD KEYS

Hosts: bermudagrass, St. Augustine, Kikuyu-grass, centipedegrass, zoysiagrass, bahiagrass

Site symptoms: Small areas of thinning turf turn off color and increase in size daily. These smaller, unkempt-looking patches coalesce into larger areas of thinning brown turf. Birds feed on affected areas leaving peck holes and small moths can be seen flying low over turf at dusk.

Plant symptoms: Above-ground plant structure shows damage from insect feeding activities that range from skeletonized upper and lower leaf surfaces to complete leaf consumption with some silken webbing. At pupation, unlike cool-season species, larvae can spin cocoons made of webbing, plant parts, and soil.

Site keys: Sunny to transitionally shaded well-managed sites.

SPECIMEN ID

Immatures are cream-colored segmented worms with yellow brown heads that range from 1/8 inch long at hatch to 3/8 inch long when fully grown. Adults are dusky brown moths with 3/4 inch wing spans and a wedge or arrowhead-shaped appearance at rest.

SCOUTING TIPS

Like other SWW species the presence of adults flying at dusk is definitive, it may not correlate to treatable larval populations. Adult TSWWs feed on nectar and other sweet food sources, so they also can be seen in flowering or fruit bearing shrubs or trees near infested sites. Once adults have been seen, monitor larval populations with soap or insecticidal flushes beginning about two weeks after peak adult activity. Turf can vary widely in its ability to tolerate higher populations of TSWW, but sites with consistently warm temperatures and high humidity or rainfall frequently suffer greater feeding damage. Larval damage at infested sites can be similar to armyworm damage - where actively feeding high larval populations can literally mow down grass.

CONTROL STRATEGIES

Cultural: Manage turf for vigorous growth. Overseed or renovate damaged areas with high-endophyte regionally-appropriate grass species or varieties that show tolerance, like common bermudagrass. Because TSWW is a true warm season species and because it has a relatively short life cycle, once it has been identified at a site, managers should maintain a consistent scouting regimen.



LARVA



ADULT

SPECIES ACTIVITY, BIOLOGY & LIFE CYCLE



Growth stages: egg - larva (up to eight instars)* - pupa - adult

* - treatable stages

Life cycle: 1 year life cycle (multiple generations)

Sequence: larva - pupa - adult - egg - larva

DISTRIBUTION



Chemical: Where scouting is ongoing, correlate larval population data with observed damage to develop site specific treatment thresholds. If this information is not available, consider control applications once damage has been observed.

SURFACE/SOIL FEEDERS

ANNUAL BLUEGRASS WEEVIL (ABW)

aka: Hyperodes weevil

scientific name: *Listronotus anthracinus*

FIELD KEYS

Hosts: Annual bluegrass

Site symptoms: Wilted turf at short-cut, highly-managed, *Poa annua* sites that turn yellow to brown in small to large areas from May to August.

Plant symptoms: Grubs hatch from eggs laid in holes in leaf bases. They enter and feed on the stem. When sawdust-like frass packs the inside of the leaf stems, grubs exit to enter new stems. Older grubs exit to feed at crowns. Adult feeding produces holes in leaves or ragged leaf edges.

Site keys: Golf courses and recreational sites where *Poa annua* is intensely managed at low cutting heights - tees, greens, fairways, tennis, and lawn bowling facilities

SPECIMEN ID

Immatures are small plump legless white grubs with light brown heads. Grubs can grow to 1/2 inch. Adults are light brown to black, 1/2 inch beetles with a beak-like snout that has two elbowed antennae near its end.

SCOUTING TIPS

Over-wintering beetles become active in early to mid-spring, look for early signs of feeding in *Poa annua* turf areas near trees/shrubs with litter at base. Affected plant leaves separate easily from crown. Leaves with stems are hollowed out and frequently filled with frass. Damage may appear as early as mid-May to as late as early August. Adult feeding and egg-laying produces small holes in stems and at leaf edges. Adults can be captured with a sweep net in evening or seen with a light while crawling on turf at night. Soap or insecticidal flushes can be used to dislodge adults from turf during daylight hours. Look for over-wintering adults in litter/mulch under trees/shrubs near infestation sites.

CONTROL STRATEGIES

Cultural: Since ABW is only a pest on *Poa annua*, either manage the site to favor existing bentgrass, renovate, or sod heavily infested areas with bentgrass varieties suited for the site. Where renovation/sodding is not an option, remove litter/mulch from base of adjacent trees/shrubs.

Chemical: Scout for adults at over-wintering sites in late winter to very early spring and at vulnerable *Poa annua* sites in early to mid-spring. If chemical control is warranted both the adults and the grubs can be treated, but at different times - adults in early to mid-spring and mid to late summer with grubs late spring to mid-summer.

Note: Although MACH 2 does not control adults, it can be applied at the time of adult migration and the residual material will affect the later larvae.



GRUB



ADULT

SPECIES ACTIVITY, BIOLOGY & LIFE CYCLE



Growth stages: egg - grub (five instars)* - pupa - adult*

* - treatable stages

Life cycle: 1 year cycle

Sequence: adult - egg - grub - pupa - adult

DISTRIBUTION



■ Indigenous states

SURFACE/SOIL FEEDERS

BILLBUG

aka: Bluegrass billbug

scientific name: *Sphenophorus parvulus*

Similar species: Hunting billbug

FIELD KEYS

Hosts: bluegrass, ryegrass, fescues

Site symptoms: Wilted turf that doesn't respond to water, turns brown in spots in June through August near walks, drives, or near trees or shrubs.

Plant symptoms: Grubs hatch inside leaf stems where they feed. Older grubs exit stems to feed at crowns. Sawdust-like frass can be found at base of plants.

Site keys: Sunny locations near trees/shrubs with litter/mulch at base and areas with reflected heat - drives, walks, or buildings.

SPECIMEN ID

Immatures are small, legless, white grubs with brown heads that can reach ½ inch. Adults are narrow football-shaped brown to black, ¼ inch beetles with a downward-pointing snout that has two angled antennae near its base.

SCOUTING TIPS

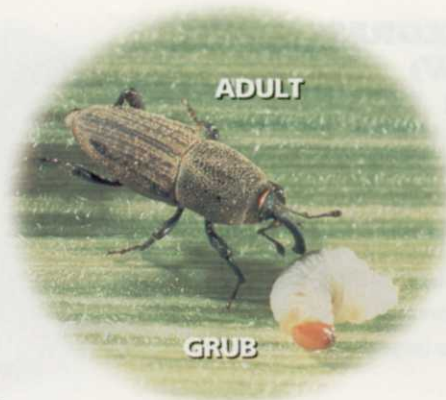
Adults are often seen crawling on warm walks or drives in early to mid-spring. Look for damaged areas near trees/shrubs with litter/mulch at base and in areas of reflected heat - walks, drives, and buildings. Damaged stems at these locations will easily pull away from crowns and may show exit holes and hollowed stems. Look for frass at the base of damaged plants on soil or in top of thatch. In off-season look for over-wintering adults in litter/mulch at the base of trees/shrubs. Use soap or insecticidal flushes to dislodge adults in season on turf.

CONTROL STRATEGIES

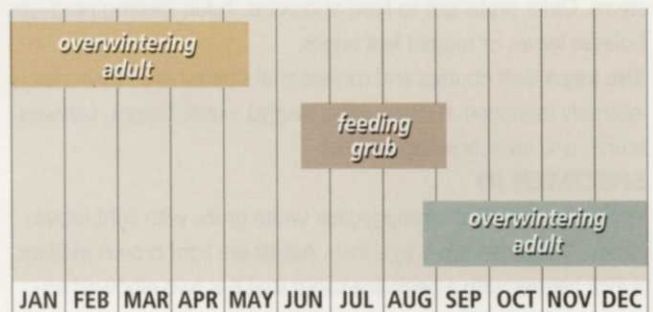
Cultural: Replant or overseed with resistant species/varieties. In bluegrass stands use fine leafed bluegrass varieties if disease is not a problem. Where disease is a problem, use high-endophyte ryegrass varieties instead. Remove litter or mulch from over-wintering locations.

Chemical: Scout for adults at over-wintering sites in late winter-early spring and vulnerable turf site areas in early to mid-spring paying attention to adjacent flat areas that show heat buildup early in the year. If chemical control is necessary, both the grub and the adult stages can be treated but at different times - adults before soil surface temperatures reach 75°F and grubs when soil surface temperatures exceed 75°F.

Note: MACH 2 is only effective against the grub stage, but because of its residual activity, MACH 2 can be applied at the adult target time.



SPECIES ACTIVITY, BIOLOGY & LIFE CYCLE



Growth stages: egg - grub (several instars)* - pupa - adults*

* - treatable stages

Life cycle: 1 year cycle

Sequence: adult - egg - grub - pupa - adult

DISTRIBUTION



Indigenous states

SOIL FEEDERS

ASIATIC GARDEN BEETLE (AGB)

scientific name: *Maladera castanea*

FIELD KEYS

Hosts: Most grass species

Site symptoms: Turf wilting under heat stress despite adequate available moisture. Wilted turf dies in irregular patches. Removed dead or wilted turf reveals grubs feeding at 2-3 inch soil depth.

Plant symptoms: Above-ground plant structure shows no obvious damage or other symptoms, however root system shows extensive damage at 2- to 3-inch depth from grub feeding.

Site keys: Sunny locations with adequate soil moisture and organic content near flowering shrubs, fruit-bearing trees, vegetable gardens, or lights that are kept on at night.

SPECIMEN ID

Immatures are six-legged white grubs with tan heads that range in size from $\frac{1}{16}$ inch for newly hatched first instars to $\frac{3}{4}$ inch for fully grown third instars. Adults are chestnut to medium brown colored, $\frac{7}{16}$ inch-long beetles with slightly iridescent wing covers.

SCOUTING TIPS

AGB over-winters at soil depths of 8- to 16-inches as a third instar grub that pupates and then emerges as an adult when nighttime temperatures exceed 70°F. Night-feeding adults, which damage flowering shrubs, tree fruits, and some vegetables, can be captured using light traps. Monitor adult capture numbers and begin grub sampling at vulnerable sites 2 to 3 weeks after the number of captures declines for 7 to 10 days.

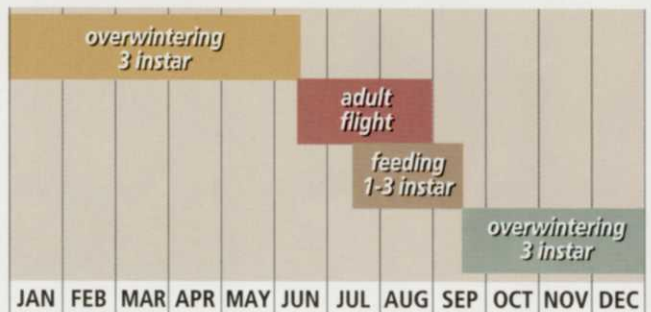
CONTROL STRATEGIES

Cultural: Limit supplemental watering at vulnerable sites (to increase egg and first instar mortality) starting when adult captures decline. Increase drainage at wet sites and manage turf for maximum root production. Turn off any lights at night near vulnerable sites.

Chemical: Once regular grub sampling indicates that the per square foot grub population has reached 8-15, consider making control applications to asymptomatic sites. At more vulnerable sites, applications may need to begin once grubs populations reach 5-8 per square foot.



SPECIES ACTIVITY, BIOLOGY & LIFE CYCLE



Growth stages: egg - grub (three instars)* - pupa - adult*

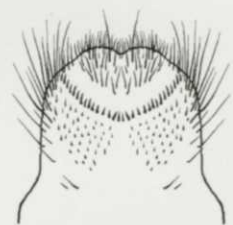
* - treatable stages

Life cycle: 1 year life cycle (multiple generations)

Sequence: grub - pupa - adult - egg - grub

RASTER PATTERN

In the field, use a 10x magnification lens to view raster patterns.



DISTRIBUTION

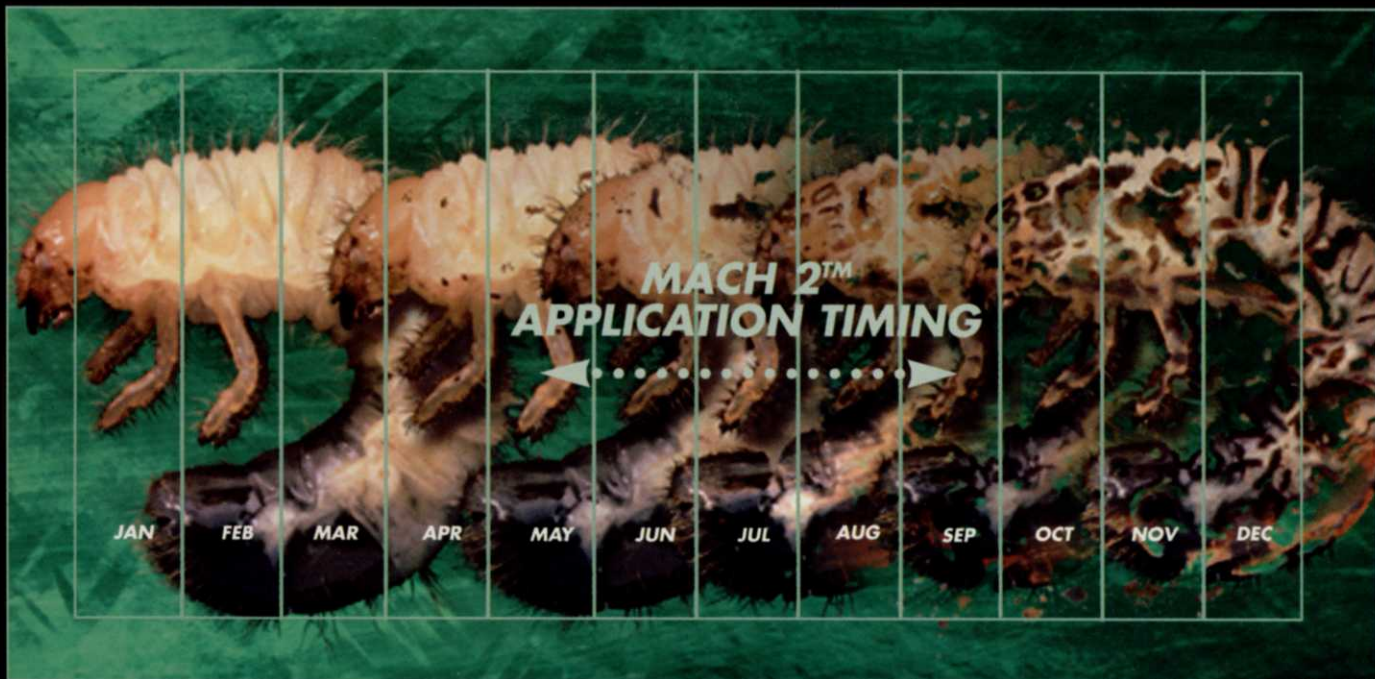


Indigenous states

**PREVENT
GRUBS.**

**STOP THEM IN
THEIR TRACKS.**

**OR MAKE SURE
IT'S NOT EVEN
AN ISSUE.**



Now you can control grubs preventatively or curatively. With a single application. Only with new MACH 2™ Turf Insecticide.

MACH 2 is a powerful killer with a new chemistry that accelerates the molting process of target insects.

Just hours after ingesting MACH 2, the insect stops feeding. Then it dies beneath the surface in 2 to 3 weeks. It's that simple.

With MACH 2™ Turf Insecticide, you'll kill target enemy insects all season long. Grubs. Cutworms. Armyworms. Sod webworms. Plus, odorless MACH 2™ is easy to apply.

You don't even have to water it in immediately.

So don't let grubs control your grounds, or your schedule. Depend on MACH 2™ Turf Insecticide.

It's all you need to prevent or cure.

For more information or for the distributor nearest you, call 1-888-764-6432.

MACH 2™
TURF INSECTICIDE

**ALL YOU NEED
 TO PREVENT OR CURE.**

SOIL FEEDERS

BLACK TURFGRASS ATAENIUS (BTA)

aka: Black Fairway Beetle
scientific name: *Ataenius spretulus*
Similar species: Aphodius Beetle

FIELD KEYS

Hosts: bentgrass, annual bluegrass, ryegrass,
Site symptoms: Wilted turf in late spring to early summer that turns brown in small to large patches despite sufficient water. Wilted and brown leaves and crowns pull up easily from soil because of extensive root damage. Many small grubs may be visible on soil below removed turf.

Plant symptoms: Extensively damaged root structure at the plants' crown/root interface.

Site keys: A serious problem on golf tees, greens, and fairways and other sports turf sites and occasionally a problem on residential sites.

SPECIMEN ID

Immatures are very small to small white grubs with full grown 3rd instars reaching 1/8 inch. Adults are small bullet shaped, reddish brown to black, shiny beetles that reach 1/8 inch.

SCOUTING TIPS

At many locations BTA is a two generation pest, so in-season adults and all three instar stages can frequently be found together. Over-wintering adults fly to site and can be seen swarming over turf at dusk on a warm evening before they burrow into soil to lay eggs. Adults can be captured with either a sweep net or black-light traps. Third instar grub is the most damaging and can be found in great numbers peaking in late June and again in August. Grubs can be sampled with a cup cutter or similar plug removal device (down to 2 inch depth).

CONTROL STRATEGIES

Cultural: At sites where BTA has been a problem monitor for swarming adults on warm evenings in spring. Natural predators do not seem to adequately control BTA, and immature concentrations that exceed 30 grubs per square foot should get additional attention. Since over-wintering sites can be as much as a mile away and are often wooded areas, cleaning the local site of debris or leaf litter may not prove helpful.

Chemical: Grub concentration thresholds that start to show damage can vary widely from 30 to 100 per square foot. Managers should correlate populations with the appearance of damage to develop site specific treatment thresholds.

Note: MACH 2 can be applied in mid-May when BTA adults migrate to egg laying sites. MACH 2 residual activity will eliminate resulting grub populations.



GRUB



ADULTS

SPECIES ACTIVITY, BIOLOGY & LIFE CYCLE



Growth stages: egg - grub (three instars)* - pupa - adult*

* - treatable stages

Life cycle: one to two generations per year

Sequence: adult - egg - grub - pupa - adult

RASTER PATTERN

In the field, use a 10x magnification lens to view raster patterns.



DISTRIBUTION



Indigenous states

EUROPEAN CHAFER (EC)

scientific name: *Rhizotrogus majalis*

FIELD KEYS

Hosts: Most grass species

Site symptoms: Turf wilting under heat stress despite adequate available moisture. Wilted turf rapidly dies in irregular patches. Removing dead or wilted turf reveals grubs feeding at the soil-thatch interface.

Plant symptoms: Above-ground plant structure shows no obvious damage or other symptoms, however root system shows extensive damage at the soil-thatch interface from grub feeding.

Site keys: Any sunny location with adequate soil moisture and organic content, managed or unmanaged.

SPECIMEN ID

Immatures are six-legged white grubs with tan heads. Third instars can reach 1 inch when fully grown. Adults are slightly shiny chestnut brown colored, ½ inch-long beetles.

SCOUTING TIPS

Over-wintering third instar grubs become active as soon as the soil thaws and continue to feed until late spring. Actively feeding over-wintering third instars may produce severe turf damage by late spring or early summer during hot or dry springs. After pupation, adults emerge on mating flights for several hours after dusk when temperatures are greater than 66°F. Mating occurs in trees and several hundred beetles can be shaken from trees or caught in sweep nets at peak flight times. Grub sampling at vulnerable sites should begin three to four weeks after adults begin to appear in light traps. EC grubs are very active feeders often continuing feeding until the ground freezes and may resume during thaws in warmer winter periods.

CONTROL STRATEGIES

Cultural: Improve drainage at wet sites and manage turf for maximum root production. Maintain turf so thatch accumulation is kept to less than ½ inch.

Chemical: Once regular grub sampling indicates that the per square foot grub population has reached 8-10, consider making control applications to asymptomatic managed sites. Unmanaged sites as well as highly vulnerable managed sites may show damage once grubs populations reach 3-5 per square foot.



GRUB



ADULT

SPECIES ACTIVITY, BIOLOGY & LIFE CYCLE



Growth stages: egg - grub (three instars)* - pupa - adult

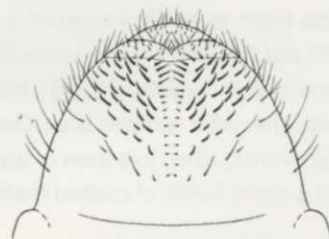
* - treatable stages

Life cycle: mostly a 1 year life cycle (multiple generations)

Sequence: grub - pupa - adult - egg - grub

RASTER PATTERN

In the field, use a 10x magnification lens to view raster patterns.



DISTRIBUTION



Indigenous states

SOIL FEEDERS

NORTHERN MASKED CHAFER (NMC)

SOUTHERN MASKED CHAFER (SMC)

scientific name: *Cyclocephala* spp.

FIELD KEYS

Hosts: Most grass species

Site symptoms: Turf wilting under heat stress despite adequate available moisture. Turf is unresponsive to water and fertilizer applications. Wilted turf turns off color and dies in irregular patches to large uniform areas. Removed dead or wilted turf reveals grubs feeding at soil-thatch interface down to 2-inch soil depth.

Plant symptoms: Above-ground plant structure shows no obvious damage or other symptoms. Root system shows extensive damage from the crown down to a 2-inch depth.

Site keys: Sunny locations with consistent soil moisture and higher organic content.

SPECIMEN ID

Immatures are typical six-legged white grubs with tan heads that range in size from $\frac{1}{8}$ inch for newly hatched first instars to 1 inch fully grown third instars. Adults are $\frac{3}{8}$ to $\frac{1}{2}$ inch-long yellow brown beetles with darker brown heads.

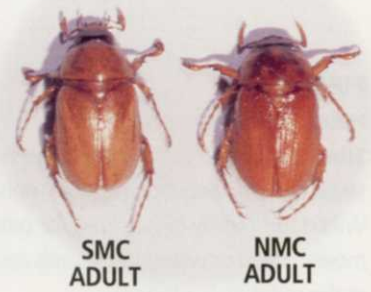
SCOUTING TIPS

Masked chafers have typical one year life cycles. Adult NMC flights begin when degree-day accumulations reach ~ 900 (base 50°F) and SMC flights begin when degree-days reach ~ 1000. Monitor adult numbers with light traps. Sample about three weeks after adult numbers peak. Overwintering 3rd instar grubs begin feeding when soils thaw or warm. Sample vulnerable sites with a recent history of masked chafers infestations in the spring.

CONTROL STRATEGIES

Cultural: NMC and SMC eggs are particularly susceptible to desiccation in drier soils, so where possible limit supplemental watering at vulnerable sites (to increase egg and first instar mortality) starting when adult flights peak. Increase drainage at wet sites and manage turf for maximum root production.

Chemical: 3rd instar masked chafer grubs often spend as much time feeding on dead organic matter as they do on grass roots. Damage threshold population densities can vary depending on turf vigor and moisture. Where no damage is visible, consider applications to asymptomatic when grub population samples are over 10 per square foot. At more vulnerable or low maintenance sites, applications may need to begin once grubs populations reach 6-8 per square foot.



SPECIES ACTIVITY, BIOLOGY & LIFE CYCLE



Growth stages: egg - grub (three instars)* - pupa - adult

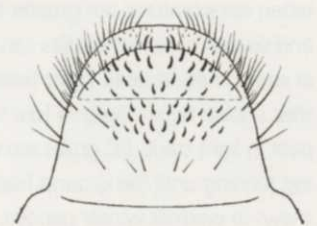
* - treatable stages

Life cycle: 1 year life cycle

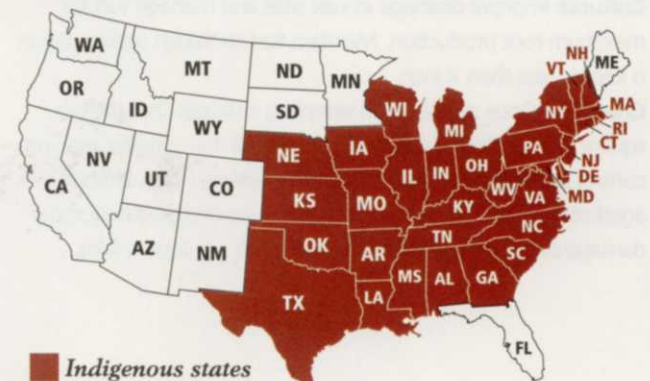
Sequence: grub - pupa - adult - egg - grub

RASTER PATTERN

In the field, use a 10x magnification hand lens to view raster patterns.



DISTRIBUTION



■ Indigenous states

SOIL FEEDERS

GREEN JUNE BEETLE (GJB)

aka: Fig Eater

scientific name: *Cotinis nitida*

FIELD KEYS

Hosts: Most grass species

Site symptoms: Irregular turf areas die under heat or moisture stress from damage caused by disrupted roots or thinned thatch layers. Grubs borrow in soil leaving loose soil and anthill-like mounds 1½ to 2-inches high.

Plant symptoms: Above-ground plant structure shows no obvious damage or other symptoms, however root system may show extensive disruption from grub tunneling and burrowing activities.

Site keys: Locations with high soil organic content or where manure or compost has been used in site management or construction.

SPECIMEN ID

Immatures are short legged white grubs with tan heads that range in size from ¼ inch for newly hatched first instars to 2-inches for fully growth third instars. Adults are large, broad-bodied beetles (1 inch long and ½ inch wide) with iridescent green heads and mottled green and brown wing covers.

SCOUTING TIPS

GJB do not directly feed on grass roots, rather turf damage results from burrowing and tunneling activities of these large grubs. At night, the grubs emerge from their borrows and crawl on their backs (up to 65 feet per night) while looking for decaying organic matter on the soil surface to feed upon. Look for small mounds of soil at burrow entrances. Also their crawling activities often leave trails in sand, loose soil or on dew-covered surfaces. Adults can be captured in light traps or may be found feeding on sugary thin-skinned fruits such as figs, grapes and peaches. Begin grub scouting 3-4 weeks after adult emergence.

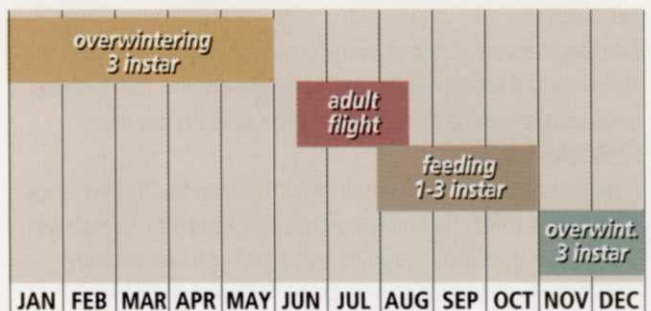
CONTROL STRATEGIES

Cultural: Monitor adult and larval populations as this pest tends to follow a 3 - 6 year damage cycle. Avoid using manures or composts in the management or construction of turf sites. Manage these sites for maximum plant recovery and overseed with stolen or rhizome producing grass species.

Chemical: Once grub scouting activities indicate per square foot grub population of 6-8 on tall cut turf, consider making control applications to infested sites. At more vulnerable sites or areas where their burrowing activities can disrupt site usage (golf and sports sites), applications may begin two weeks after adult emergence. Early applications also reduce the chance of large grubs surfacing and dying.



SPECIES ACTIVITY, BIOLOGY & LIFE CYCLE



Growth stages: egg - grub (three instars)* - pupa - adult*

* - treatable stages

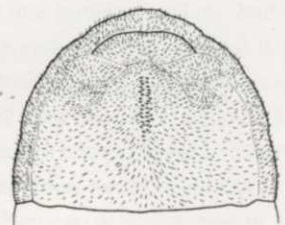
Life cycle: 1 year life cycle

grub - pupa - adult - egg - grub

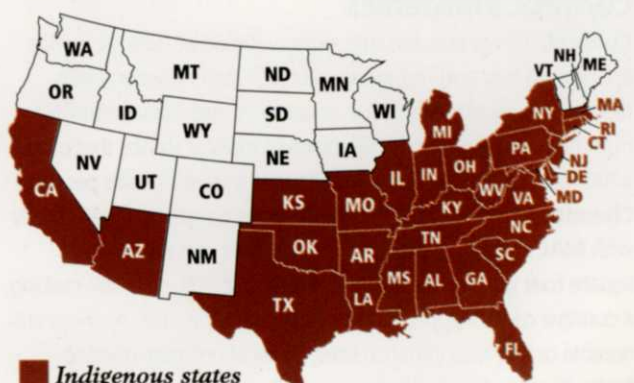
Sequence: grub - pupa - adult - egg - grub

RASTER PATTERN

In the field, use a 10x magnification hand lens to view raster patterns.



DISTRIBUTION



SOIL FEEDERS

JAPANESE BEETLE

scientific name: *Popillia japonica*

FIELD KEYS

Hosts: Most grass species

Site symptoms: Turf wilting under heat stress despite adequate available moisture. Wilted turf dies in irregular patches. Removed dead or wilted turf reveals grubs feeding at soil - thatch interface down to 2-inch soil depth.

Plant symptoms: Above-ground plant structure shows no obvious damage or other symptoms. Root system shows much feeding damage from the crown down to a 2-inch depth.

Site keys: Sunny locations with consistent soil moisture and moderate soil temperatures and flowering shrubs, fruit-bearing trees, and vegetable or agriculture production in the area.

SPECIMEN ID

Immatures are six-legged white grubs with tan heads that range in size from ¼ inch for newly-hatched first instars to 1¼ inch for fully-grown third instars. Adults are ¾ to 1 inch beetles with metallic green heads and shiny bronze colored wing covers.



SPECIES ACTIVITY, BIOLOGY & LIFE CYCLE



Growth stages: egg - grub (three instars)* - pupa - adult*

* - treatable stages

Life cycle: 1 to 2 year life cycle

Sequence: grub - pupa - adult - egg - grub

SCOUTING TIPS

JB over-winters as a third instar grub at soil depths of two to six inches which resumes feeding in April and May, pupates, and emerges as an adult 30 days later. These voracious daylight-feeding adults reach maximum numbers on sunny days when temperatures are 70° - 95° F and humidity is low to moderate. Adult numbers can be monitored with lure attractants or with sweep nets at feeding sites on flowering shrubs, roses, or fruit-bearing trees. Grub sampling should begin 3-4 weeks after maximum adult numbers have been seen. JB larva are vulnerable to extremes of temperature and moisture, so in dry years sample in low or wet areas. In wet years, sample at elevated or drier locations. In years following very cold and dry winters, look in areas with a history of damage.

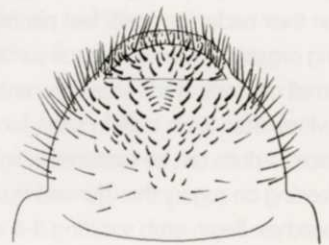
CONTROL STRATEGIES

Cultural: Where possible limit extra watering at vulnerable sites (to increase egg and first instar mortality) starting when adult flights peak. Increase drainage at wet sites and manage turf for maximum root production. Removal of trees or shrubs that exhibit adult feeding is unnecessary; adults can fly up to 5 miles per day.

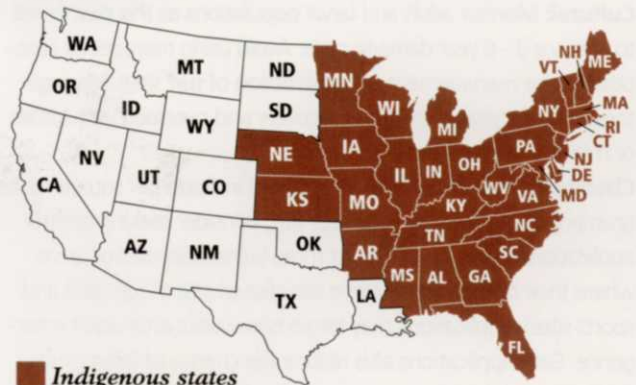
Chemical: Historically, infested areas can be treated preventively with MACH 2. Once regular sampling indicates that the per square foot grub population has reached 8 -10, consider making a curative control application to asymptomatic sites. At more vulnerable or low maintenance sites, applications may need to begin once grubs populations reach 3 - 5 per square foot.

RASTER PATTERN

In the field use a 10x magnification hand lens to view raster patterns.



DISTRIBUTION



■ Indigenous states

SOIL FEEDERS

MAY/JUNE BEETLES (M/JB)

aka: May Beetle, June Beetle, Junebug

scientific name: *Phyllophaga* spp.

FIELD KEYS

Hosts: Most grass species

Site symptoms: Turf wilting under heat stress despite adequate available moisture. Turf is unresponsive to fertilizer applications. Wilted turf turns off color and dies in irregular patches to large uniform areas. Removed dead or wilted turf reveals grubs feeding at soil - thatch interface down to 2-inch soil depth.

Plant symptoms: Above-ground plant structure shows no obvious damage or other symptoms. Root system shows much damage from the crown down to a 2-inch depth from grub feeding.

Site keys: Sunny locations with consistent soil moisture and moderate soil temperatures.

SPECIMEN ID

Immatures are typical six-legged white grubs with tan heads that range in size from ¼ inch for newly hatched first instars to 1½ inch fully-grown, third instars. Adults are ¾ to 1-inch light to dark brown beetles.

SCOUTING TIPS

Despite the large number of *Phyllophaga* spp. comprising M/JB, they all have a similar growth pattern - the majority of time is spent as 3rd instar grubs. Adult flights begin when evening temperatures are greater than 60°F. Adult numbers can be monitored with light traps and grub sampling should begin about four weeks after adult numbers peak. New adult emergence for different species may occur sequentially, so do a consistent job of classifying which species is seen when. Most M/JB species have multi-year life cycles. Vulnerable sites with infestation history should be sampled in May (second year grub) or August (first year grub) to avoid damage.

CONTROL STRATEGIES

Cultural: Where possible limit supplemental watering for about 4 weeks at vulnerable sites (to increase egg and first instar mortality) starting when adult flights peak. Increase drainage at wet sites and manage turf for maximum root production.

Chemical: Because of the number of different species and different life cycles involved in M/JB, it is important to correlate the data about grub populations with observed damage to develop a decision-making matrix. Or, consider making control applications to asymptomatic sites when grub sampling indicates that the per square foot grub population has reached 5-10. At more vulnerable or low maintenance sites, applications may need to begin once grubs populations reach 3-4 per square foot.

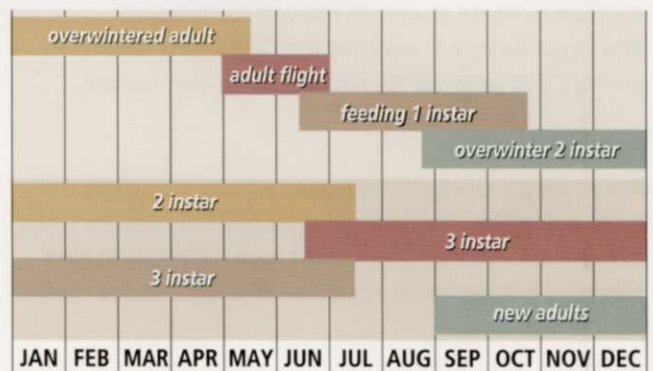


GRUB



ADULT

SPECIES ACTIVITY, BIOLOGY & LIFE CYCLE



Growth stages: egg - grub (three instars)* - pupa - adult

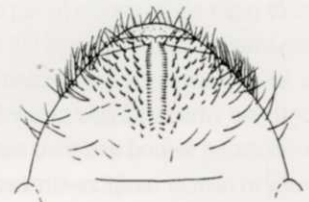
* - treatable stages

Life cycle: 1 to 4 year life cycle

Sequence: grub - pupa - adult - egg - grub

RASTER PATTERN

In the field use a 10x magnification hand lens to view raster patterns.



DISTRIBUTION



SOIL FEEDERS

ORIENTAL BEETLE (OB)

scientific name: *Anomala orientalis*

FIELD KEYS

Hosts: Most grass species

Site symptoms: Turf wilting under heat stress despite adequate available moisture. Wilted turf dies in irregular patches. Removed sod of dead or wilted turf reveals grubs feeding at 1-inch soil depth.

Plant symptoms: Above-ground structures show no obvious damage or other symptoms, however root system shows extensive damage at 1-inch depth from grub feeding. Nearby ornamental plant roots may also be damaged.

Site keys: Sunny well managed short and tall cut turf sites locations with adequate soil moisture and organic content.

SPECIMEN ID

Immatures are six-legged white grubs with light tan heads that range in size from 1/8 inch for newly hatched first instars to 1-inch fully grown third instars. Adults are a wide bodied tan to black colored, 1/2 inch beetles often with tan and black mottled markings on wing covers.

SCOUTING TIPS

OB over-winters at soil depths of 8 to 16 inches mostly as a third instar grub that begins to move up in soil to feed when soil temperatures reach 45°F. After pupation adults emerge in early to mid-summer. Adults are not strong fliers (usually less than 50 yards) and are usually seen during warm days with strong sunlight. At night adults can be found crawling on turf under lights. Grub sampling should begin at OB vulnerable sites 3 - 4 weeks after adult emergence. Late second instars may over-winter for a second year when soils cool below 50°F. Vulnerable sites with over-wintering second and third instars may show early feeding damage in heat or moisture-stressed springs.

CONTROL STRATEGIES

Cultural: If possible, limit supplemental watering at OB vulnerable sites (to increase egg and first instar mortality) starting 3 weeks after adult emergence. Increase drainage at wet sites and manage turf for maximum root production.

Chemical: Once regular grub sampling indicates that the per square foot grub population has reached 8 - 10, consider making control applications to asymptomatic sites. At more vulnerable sites applications may need to begin once grubs populations reach 3-5 per square foot.



SPECIES ACTIVITY, BIOLOGY & LIFE CYCLE



Growth stages: egg - grub (three instars)* - pupa - adult

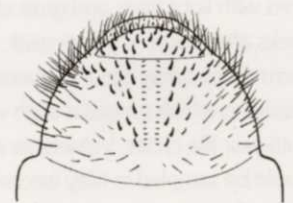
* - treatable stages

Life cycle: Mostly a 1 year life cycle (multiple generations)

Sequence: grub - pupa - adult - egg - grub

RASTER PATTERN

In the field, use a 10x magnification lens to view raster patterns.



DISTRIBUTION



INSECT IDENTIFICATION GUIDE

A TURFGRASS ENTOMOLOGY RESEARCHER'S VIEW

Dr. David L. Shetlar, Ph.D.

MAACH 2 represents the first insect growth regulator-type insecticide to come to the turfgrass market. Insect growth regulators—or IGRs—have been known to entomologists for many years and several pesticides have been formulated and used successfully in other markets, especially in the greenhouse and forest arenas. The beauty of IGRs, in general, is that they have very low toxicity to non-insect groups. IGRs can take many forms, but most interfere with the hormonal systems that insects use to grow, especially the process of shedding their skin (molting). MACH 2 falls into a group of compounds that researchers have dubbed the “MACs” which stands for “molt accelerating compounds.” When ingested, these compounds “tell” an insect that it is time to molt, whether this would be the correct time or not. The insect undergoes the molt and often does not survive because it is too early for a normal molt. MACH 2 is one of the MACs that seems to remain stable in the turfgrass environment and has activity on white grubs and most of the turfgrass infesting caterpillars, cutworms and sod webworms.

Because of its unique mode of action, entomologists are excited about using MACH 2 in resistance management. Many insects have become resistant to traditional organophosphate or carbamate insecticides that adversely affect the nervous system. It is much more difficult for an insect to develop a new molting method that would counteract the action of MACH 2.

Another unique attribute of MACH 2 is its relatively long residual life in turf soil and thatch. Early tests have suggested that insect active residuals remain for 60 to 100 days, or more. This efficacy period opens up other opportunities for using MACH 2, that is, multiple targeting of pests. Our studies in Ohio have suggested that MACH 2 can be applied in late May or early June on golf courses to manage the first generation of black turfgrass ateneus grubs, keep down black cutworm damage for



about 60 days *and* knock down the normal annual grubs (Japanese beetles and masked chafers) that appear in late July and August. Lawn care companies could also take advantage of such multiple targeting. There is also good data to show that MACH 2 does very well at controlling sod webworm larvae.

For those serious about IPM principles, especially where sampling is a must before a control product is applied, MACH 2 appears to have considerable activity on second instar white grubs and early third instars. They are usually present in late August and early September. Therefore, MACH 2 can be used as an early curative control insecticide.

In summary, MACH 2 brings to the turf insect control arena a new chemistry, long residual activity, multiple targeting capability, as well as curative action.



Top: Dr. David Shetlar examines turf for grub counts.

Below: volunteers help with grub counts at Ohio State University research plots

INSECT IDENTIFICATION GUIDE

HOW TO USE MACH 2 -

MACH 2 is available in two convenient formulations - MACH 2 Granular and MACH 2 Liquid. MACH 2 Granular is approved for use on all turf sites including residential lawns, golf courses, athletic fields and sod farms.

MACH 2 Liquid is approved for use on commercial turf sites including golf courses, office buildings, sod farms and similar settings. The liquid formulation is not yet registered for use on residential lawns or athletic fields. Consult product label for additional information.

PESTS CONTROLLED AND USE RATES FOR MACH 2

PEST	Formulated Product Use Rate		Formulated Product Use Rate		REMARKS
	PER 1000 SQ FT	PER 1000 SQ FT	PER ACRE	PER ACRE	
	MACH 2 LIQUID	MACH 2 GRANULAR	MACH 2 LIQUID	MACH 2 GRANULAR	
Cutworms	↑	↑	↑	↑	Apply at first sign of pest damage. A single repeat application can be made if needed.
Sod Webworms	1.5 fl oz	1.55 lb	2 qt	67 lb	
Armyworms	↓	↓	↓	↓	
Fall Armyworms	↓	↓	↓	↓	
WHITE GRUB LARVAE SUCH AS:					
Japanese beetle	↑	↑	↑	↑	Make only one application per year
Northern masked chafer	↑	↑	↑	↑	
Southern masked chafer	↑	↑	↑	↑	
European chafer	↑	↑	↑	↑	
Oriental beetle	↑	↑	↑	↑	
Asiatic garden beetle	2.2 fl oz	2.3 lb	3 qt	100 lb	
May/June beetle	↓	↓	↓	↓	
Black turfgrass ataenius	↓	↓	↓	↓	
Green June beetle	↓	↓	↓	↓	
Annual bluegrass weevil	↓	↓	↓	↓	
Billbugs	↓	↓	↓	↓	

Note: A minimum of 1 gallon of finished spray per 1000 sq ft is required for adequate spray distribution.

INSECT IDENTIFICATION GUIDE

VITAL FACTS ABOUT THE POWER OF MACH 2™.

- ▶ MACH 2™ Turf Insecticide mimics an insect-specific hormone that causes premature molting, disrupting the natural metamorphosis process.
- ▶ The residual power of MACH 2 spares the area from feeding damage by a new generation of grubs—making it an ideal preventative treatment.
- ▶ As a curative treatment, MACH 2 has the knockdown power that stops grub damage to the turfgrass within hours after it's ingested.
- ▶ One application can take you through the peak months of the season.
- ▶ No immediate irrigation needed, under normal turf-growing conditions with normal rainfall.
- ▶ Universities and turfgrass professionals have tested MACH 2™ Turf Insecticide extensively on numerous types of turfgrasses and grub species.
- ▶ Two convenient formulations are available: MACH 2 Granular and MACH 2 Liquid.
- ▶ MACH 2 is odorless.

INSECT IDENTIFICATION GUIDE

A GUIDE FOR THE PROFESSIONAL TURFGRASS MANAGER

This special "Turf Managers' Guide to Insect Identification" has been brought to you by MACH 2 Turf Insecticide.

This guide was designed to help you—the professional turfgrass manager—with the difficult job of accurately identifying the pests damaging your turf so that you can confidently choose the most effective means of control possible.

Turfgrass entomologists have identified many species of pests that cause damage to turf on golf courses, industrial parks, home lawns and other turf locations. Frequently, the differences between some of these pests are barely visible—even to the trained eye. Yet accurate identification is necessary in order to choose the proper control method, whether preventative or curative.

Today's IPM programs demand the use of insecticides that are both highly effective and targeted specifically to control only the problem pests, without harming non-target species.

About RohMid

RohMid LLC, the sponsor of this supplement, is a marketing and sales joint venture between American Cyanamid Company and Rohm and Haas Company, two leaders in the professional turf and ornamental industry. The companies formed this venture in 1995 for the sole purpose of developing, registering and commercializing MACH 2 Turf Insecticide.

We're sure you'll find the "Turf Managers' Guide to Insect Identification" a useful resource for diagnosing and treating your turf for the toughest pests. You can always look to LANDSCAPE MANAGEMENT and MACH 2 Turf Insecticide for answers to your questions about the most effective turf management. For additional information about MACH 2 or for the distributor nearest you, call 1-888-764-6432.

Magnify your results!



Your target wants to see more from you.

Advanstar Direct Mail Lists are precisely targeted.

Which means that regardless of what
you're sending, your target will receive it.

TARGETED NAMES

UPDATED QUARTERLY — *NEW NAMES!*

GUARANTEED DELIVERABILITY

HIGHLY SELECTABLE

ASK ABOUT 24 HOUR TURNAROUND



we target !

ADVANSTAR
DIRECT MAIL LISTS

Call today:

888-RENT-LIST

Art, Beauty & Fashion
Entertainment / Marketing
Energy & Environmental Management
Landscaping, Pest Control & Roofing
Motor Vehicles
Telecommunications
Travel / Hospitality
And More ...

Spring is the time to initiate new growth for turfgrass, and for many managers, it's the time to get some needed nutrition back to lazy turf.

After winter dormancy, both warm- and cool-season turf begins an important period of growth. For northern turf, spring and fall represent the peak seasons for shoot and

reach between 75 and 90 degrees F. Nutritional programs often coincide with these peaks.

Nature alone helps stimulate spring green-up, but most turfgrasses need additional fertilization to achieve maximum growth potential. Spring fertilization is especially critical on recreational turf areas, such as soccer fields which receive intense traffic from increasing play each season. Without additional fertilization they often become severely worn and weed-infested.

To get turf started

For cool-season turf, "starter type" formulations are popular choices. These products supply nitrogen, phosphorous and potassium in ratios which are desirable for spring shoot and root growth. Unlike high nitrogen formulations which promote

Fertilization & nutrition: a varied arsenal

Most turfgrasses need additional fertilization to achieve maximum growth potential.

by JOHN ROBERTS, Ph.D.

root development, when temperatures range between 50 degrees and 75 degrees F.

Root initiation occurs first in early spring, when soils begin to thaw. Active shoot development follows, as temperatures climb between 60 and 75 degrees F.

For warm-season turf, late spring through summer represents the optimum time for development, as temperatures

mostly topgrowth, starter types contain higher proportions of phosphorous (i.e., a 1:2:1 ratio).

The added phosphorous helps initiate root development and early turf establishment of new seedlings.

Go easy on nitrogen

Nitrogen is the most important element in a turfgrass fertilization program. However, there are limits to its use.

When turfgrasses are over-fertilized with spring N, excessive topgrowth—which requires extra mowing—and shallow rooting will result.

There is also a greater threat of nitrate leaching, a higher incidence of disease and reduced environmental stress tolerance, including summer drought.

In most situations, avoid applications of more than one pound of N/1000 sq. ft. when using "fast release" or highly water soluble nitrogen.

Fall fertilization benefits are obvious.





One of the author's key concerns is field errors that can result in misapplication, such as this fertilizer spill.

When using only fast-release nitrogen sources, light applications, $\frac{1}{8}$ to $\frac{1}{2}$ pounds of N/1000 sq. ft., are more desirable, and should be applied more frequently.

This spoon-feeding approach has become increasingly popular on golf course putting greens.

Fast-release/slow-release

A widely used strategy in the spring is to fertilize with products that have a combination of fast- and slow-release nitrogen sources. Fast-release nitrogen stimulates earlier green-up and growth which is often sought in recreational and landscaped settings. Slow-release nitrogen sources, whether synthetic or natural organic, last

eight to 15 weeks, and are less likely to burn the turf and release nitrogen more uniformly than inorganic N sources.

Turf managers often must strike a balance between which combinations to use in each situation.

Sometimes this requires supplementing small amounts of fast-release nitrogen into the spring application.

Late/dormant application an alternative

A late fall or dormant fertilization can provide a successful alternative to an early spring application. This strategy is primarily used by athletic field managers to:

- ▶ accelerate spring green-up and growth;
- ▶ help distribute the workload more evenly over the year;
- ▶ avoid traffic damage to soft, wet turf.

One major concern with late fall fertilization is the increased potential of nitrate leaching during the winter. Using lighter rates of slow-release nitrogen will help reduce this threat. However, this strategy will generally be slower to stimulate growth in cold spring soils.

pH affects nutrient availability

The soil pH has a considerable influence on the availability of most nutrients. Phosphorous is an example of a nutrient that is most available when the soil pH is between 6.0 and 7.0. However, in highly acidic soils with pH of less than 5.0, phosphorous gets "tied up" with iron and aluminum to form complexes which are unavailable to turfgrasses.

Maintaining near neutral soil pH values also favors the activity of beneficial soil microorganisms, the release of nitrate from nitrogen fertilizers and more vigorous growth of most turfgrasses.

In highly acidic soils, toxic concentrations of aluminum, iron and manganese may develop and cause impaired rooting (roots will appear short, brown and spindly) a decrease in overall

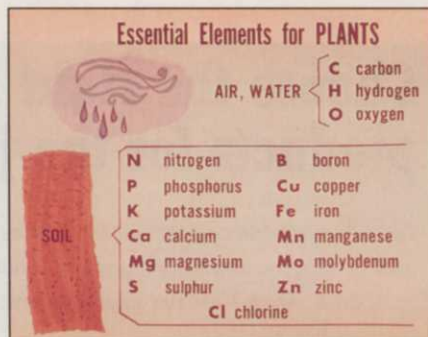
turf vigor, shoot growth, drought tolerance and recuperative potential.

Keep potassium levels high

Potassium plays a vital role in plant nutrition, and deserves more attention in many fertility programs.

Research has shown how important it is to keep potassium levels high during the growing season. Potassium is known to enhance turf tolerance to various environmental and biological stresses, including cold, traffic, disease and drought tolerance.

A nitrogen to potassium ratio of 3:2 has generally been considered desirable. How-



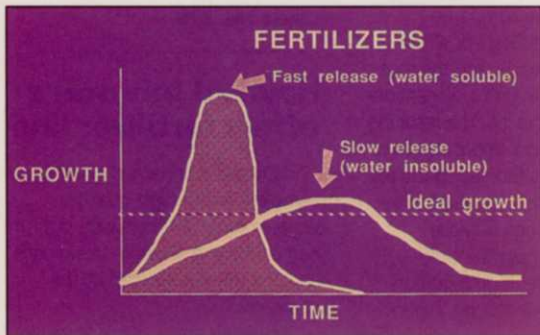
Essential elements for plants combine macro-nutrients with micro-nutrients.

ever, higher potassium ratios to nitrogen, such as 1:1 or 1:2 have improved stress tolerance in some investigations, even when soil tests indicate potassium levels are adequate.

Potassium is highly water soluble and subject to rapid leaching both within the leaf tissues and in soils with low cation exchange capacity. Potassium deficiencies can occur just a few days following a fertilization, especially on intensely managed, irrigated turf growing in sandy soils.

Light, frequent potassium applications with slow-release carriers helps to reduce potassium leaching in these situations.

The author is an extension specialist in turf science at the University of New Hampshire.



Fast-release nitrogen stimulates earlier green-up and growth which recreational and landscaped settings often need. Slow-release nitrogen sources, whether synthetic or natural organic, last eight to 15 weeks.

Fertilization & Nutrition products cont. on next page

Fertilization & Nutrition products

High performance golf fertilizers

The Andersons' Early Order Discount Program is in gear and now is the time to save on Tee Time products for golf course turf.

- ▶ Tee Time 16-4-8 with ammonium sulfate;
- ▶ 5-5-25 with Dimension;
- ▶ 21-3-16 and 18-6-15 Greens Grade;
- ▶ 25-5-15 with SCU;
- ▶ 14-0-24 Fairway Grade;
- ▶ 10-3-10 with Nutralene and Dithiopyr.

Call 1-800-225-ANDY or

Circle No. 274

Choose the right fertilizer products for the job

Quickly-available or water soluble sources provide a rapid growth response under good growing conditions and include:

- 1. Urea**, which is a water soluble organic compound that contains 45% N.
- 2. Inorganic salts** such as ammonium nitrate, ammonium sulfate, potassium nitrate, calcium nitrate and ammonium phosphates.
- 3. Methylol ureas**, formed by reacting urea with formaldehyde have produced growth responses similar to other water soluble sources but vary based on formulation. Examples of such products include:
 - ▶ **Form-U-Sol**, which has 28 percent N, of which 67 percent is urea and 33 percent is methylol urea;

cont. on page 48

'Extraordinary' green-up, says company

Emerald Isle has environmentally safe, scientifically proven biostimulants, soil amendments, fertilizers, micronutrients and bioaugmentation materials that significantly improve turfgrass.

For extraordinary, sustained greening, the company developed SeaQuential, a multiple chelate iron

and micronutrient formula. With OptiMil, they engineered what they say is the first combined organic amendment and fertilizer to enhance fertilizer efficiency and agronomic performance in high-sand-topdressing regimes.

For more information, call 800-628-GROW and mention LM, or **Circle No. 275**

Essential soil amendment contains carbon

Essential soil amendment and biostimulant contains concentrate carbon that decomposes, supplying renewed organic matter. Essential feeds microbes and supplies nutrients to the turf.

The product has 7 percent active humic acid in an agronomically correct ratio to kelp, plus 24 amino acids, sugars, carbohydrates and natural sequestrants. A money-back guarantee is provided. Contact Essential at 800/648-7626 and say you saw it in LM, or **Circle No. 276**

Green-Relief Beneficial Microbes

Green-Relief has a no-risk 90-day challenge for testing its Green-Relief program on your golf course. Green-Relief Beneficial Microbes are now known as the leading non-toxic course-conditioning product, according to the company.

Green-Relief Beneficial Microbes move rapidly into the root zone, forming a symbiotic relationship with plant roots. The resulting microbial network improves plant performance by facilitating the uptake of nutrients and water while aiding in pathogen defense.

Other advantages include a 50 percent faster seed germination rate, deeper root growth, higher tolerance for heat, cold and physical stress and, a 25 percent reduction in seed rates. Call 800/788-9886 or **Circle No. 277**

Avoid burn with potash product

Sulfate of Potash from Great Salt Lake Minerals Corp. can be used during the hottest months to provide potassium and sulfur without fear of damage to the turf. Use of Sulfate of Potash also results in better rooting, drought resistance, heat and cold tolerance and better wear resistance. Increased grass response to nitrogen, phosphate and other nutrients is also provided.

Other benefits cited are disease resistance qualities for Fusarium Patch, Ophiobolus Patch, Dollar Spot Fungus and Powdery Mildew. Poa Annua can also be suppressed. To find out more, call 913/344-9302 and mention you saw this item in *LANDSCAPE MANAGEMENT*, or **Circle No. 278**

20 solutions from Growth Products

Growth Products offers a line of 20 liquid fertilizers and and micronutrients following 20 years of research and developments in polymer chemistry. The company prides itself on offering the highest levels of consistency and accuracy.

Landscape managers are able to avoid salts, chlorides and excess sulfur when using materials from Growth Products, according to the company. For more information and a sample call 800/648-7626 and mention LM or **Circle No. 279**

Howard Johnson's offers fertilizer line

Howard Johnson's is offering a complete line of high-quality, water-soluble fertilizers with poly-bag packaging. Custom blending is another service provided by the company.

Materials are available in variations that include high phosphorous, no phosphorous, acidity, "triple 20," starter food, tropical food, bloom food and foliar food. Call 800/298-4656 or **Circle No. 280**

GET SERIOUS WITH STMA!

**Enhance your Professionalism
Share Ideas with Others
Network**

**Become a Certified Sports Turf Manager
Save Money on Educational Opportunities
Receive Numerous Reference Materials**

The Sports Turf Managers Association (STMA) is an organization of professionals representing all segments of the sports turf industry. Our members work to combine the science of growing turfgrasses and the art of maintaining sports turf to produce playing fields that are both safe and aesthetically pleasing.

STMA provides members with a variety of benefits, including: education through regional institutes and conferences; support for sports turf research; facilities tours; a national awards program; access to the STMA National Conference & Exhibition; our *Sports Turf Manager* Newsletter; and MUCH more!

STMA Mission Statement:

"To become the leader in the sports turf industry, to enhance, promote and improve professionalism through excellence in communication, training, research, education and services."

Application for Membership

Member Information

Name _____
 Title _____
 Employer _____
 Type of Business _____
 Address _____
 City/state/zip _____
 Phone _____ Fax _____
 E-mail Address _____
 Signature _____
 Referred by _____
 (LM)

Membership Category (please check one)

- Professional sports turf facility manager \$85
 - Four-year colleges and universities sports turf facility manager \$85
 - Other schools, research, Ext. Agents, teaching \$85
 - Parks and recreation sports turf facilities \$85
 - Commercial (US or International) \$195
 - Additional members from same company \$50
 - Student (non-voting) \$20
 - International (other than commercial) \$85
(must be in US dollars)
 - Local Chapter (call for amount) _____
- Total amount enclosed \$ _____**

Please enclose payment (check, money order, Master Card, Visa, Discover or American Express) and send to:
 Sports Turf Managers Association, PO Box 3480, Omaha, NE 68103-0480

For more information, contact STMA Headquarters at
 800/323-3875, 712/366-2669, fax: 712/366-9119 or e-mail: TrustyTips@aol.com

"Promoting Better and Safer Sports Turf Areas"

Fertilization & Nutrition products

cont. from page 46

Lebanon hones distribution network

Lebanon Turf Products is aiming at providing the best customer service by developing the industry's largest distribution network. The company has more than 70 local independent distributors nationwide.

Lebanon says that customers can always count on right-on-time deliveries and elimination of the guess work frequently encountered by landscape managers seeking application materials. For more infor-

mation around sensitive environmental areas such as wetlands, streams and lakes.

Circle No. 282

Nitroform has controlled release

Nitroform provides more than 90 percent controlled release nitrogen for sustained and predictable feeding all season long. The consistent release pattern is not dependent on coating or particle size.

Nitroform's energy-rich carbon and its nitrogen promote increased microbial activity—even in low organic soils, according to the company. The product resists leaching in sandy soils. For more information, call 888/764-1988 and mention LM or

Circle No. 283

Turf Cocktail for golf courses

Turf Cocktail is being cited as a 100 percent environmentally safe organic fertilizer and biostimulant. It is made from whole Atlantic fish, natural sugar and plant protein extracts.

According to Northeast Organics Inc., the product is proven to stimulate and support beneficial soil microbes and increase antioxidant activity. It also is effective in enhancing color by turning on chlorophyllase. Distributor inquiries are invited. Say you saw it listed in *LANDSCAPE MANAGEMENT* when calling 800/924-7347, or

Circle No. 284

Morrall introduces Green Effects

Morrall is introducing a new line of fertilizers and pesticides known as Green Effects. The company strives to provide innovation, quality and service.

The line has six product groups, which includes products for tree and shrub care, professional turf managers, golf courses, private labeling and ice melting materials. For more information call 800/554-3981 and mention you saw this no-

tice in LM, or
Circle No. 285

Calcium corrector on market

Quelant-Ca is a newly available amino acid, chelated calcium product that corrects calcium deficiencies in turfgrass.

The product is normally applied as a foliar spray and may also be applied through fertigation. It is tank-mix compatible with herbicides, soluble fertilizers, insecticides, fungicides and plant growth regulators.

Contact Nutramax labs Inc. at 800/925-5187 and say you saw it in LM, or

Circle No. 286

Green-T helps turf management

Green-T liquid fertilizer formulations contain an advanced new controlled release nitrogen source designed to enhance the health, appearance and color of turf.

One feature of Green-T is its clear liquid form, making it easier to measure and mix with water and compatible pesticides. The product does not readily leach or volatilize. Mention *LANDSCAPE MANAGEMENT* when you call 800/562-1291 or

Circle No. 287

Plant Health Care branches out

Plant Health Care Inc. is marketing products aimed at tree and shrub care, lawn maintenance and seeding and sodding. The line includes wetting agents, biostimulants, inoculants and hydrogels.

The IronPak biostimulant corrects iron deficiencies in grasses and ornamental plants. Call the company at 800/421-9051, or

Circle No. 288

A 3-dimensional approach

A 3-dimensional approach to turfgrass nutrition is being offered

cont. from page 46

► **CoRon** is 28 percent N, has 50 percent urea and 50 percent methylol urea. It is an aqueous solution and its release is dependent upon microbial activity, but due to the relatively high urea content, it has shown to be effective in cool-seasons on turf-grasses.

► **Nitro-26**, which is 26 percent N with 30 percent urea and 70 percent methylol urea.

Slowly-available, slow-release or water insoluble sources are released based on manufacturing processes. These include:

1. Urea formaldehyde (UF): Also called Nitroform, Ureaform, Blue-Chip, etc. Contains 38 percent N. Nitrogen release is based on activity index of various forms of water-insoluble nitrogen (WIN)

2. FLUF is a flowable form of UF that contains about 18 percent N, of which 20-25 percent is water insoluble and thus has less burn potential than soluble sources.

cont. on page 50

mation, contact Lebanon at 800/233-0628 and mention *LANDSCAPE MANAGEMENT* or
Circle No. 281

Nature Safe uses plant/animal meals

Nature Safe is a blend of various plant and animal meals that are balanced in sugars, starches, carbohydrates, proteins and fats. These meals contain essential natural amino acids, chelated secondary elements, vitamins and enzymes.

According to the company, Nature Safe has minimal leaching and volatilization and is ideal for applica-

WHAT'S A BUSH HOG®?



For over 30 years Bush Hog® has meant tough, efficient farm equipment. The kind farmers brag about. Now Bush Hog is something else... tough, efficient turf/landscape equipment. The kind turf and landscape operators brag about.

Because Bush Hog is making its reputation with turf/landscape operators as powerful as its reputation with farmers. By applying lessons learned on the farm - where every season is make it or break it - to the turf/landscape industry. By bringing new benefits to landscape/turf operators that make you look your best. From mulchers that make leaves and grass

clippings disappear to finishing mowers that slash the time to manicure lawns. By building Bush Hog quality and performance into a full line of turf/landscape equipment.

Learn what a Bush Hog can mean to you. See the Bush Hog turf/landscape equipment at your Bush Hog dealer or write for free literature.


BUSH HOG® **TURF AND LANDSCAPE TOOLS™**

We Make You Look Your Best™

ZERO-TURN MOWERS • TRI-DECK MOWERS • AIR TUNNEL FINISHING MOWERS • REAR DISCHARGE FINISHING MOWERS • SIDE DISCHARGE FINISHING MOWERS • FLAT DECK FINISHING MOWERS • GT42 POWERED ROTARY CUTTERS • BOX BLADES • ROLL-OVER BLADES • SINGLE ROLLER PULVERIZERS • DOUBLE ROLLER PULVERIZERS • PLUGGERS • BACKHOES • LANDSCAPE RAKES • ROTARY TILLERS • REAR BLADES • POST HOLE DIGGERS • ROTARY CUTTERS • CHIPPER/SHREDDERS • FRONT END LOADERS



BUSH HOG®

DIVISION OF  ALLIED PRODUCTS CORPORATION

Dept. LM-02 • P.O. Box 1039 • Selma, AL 36702-1039 • (334) 872-6261

Name _____
 Address _____
 Town _____ County _____
 State _____ Zip _____
 Phone No. (_____) _____
 Products interested in _____

Fertilization & Nutrition products

cont. from page 48

by the Plant-Wise Biostimulant Co. as it presents its 3D plant growth supplement concentrate.

3D is a special blend of fortified seaweed extracts, concentrated humic acid and readily available micronutrients designed to provide foliar enhancement, physiological integrity and foundation fortification.

For more information, contact the company—saying you saw it in LM—at 800/334-4962, or

Circle No. 289

cont. from page 48

3. Nutralene is a methylene urea product with about 40 percent N.

4. Isbutlydene diurea, also called IBDU, contains 31 percent N. Its rate of N release is dependent upon the hydrolysis of the product.

Coated N sources are made by coating urea or complete fertilizer prills with an impermeable or semipermeable coating.

1. Sulfur-coated Urea (SCU) is produced taking prilled urea and spraying it with molten sulfur.

2. Polymer-coated Urea (PCU) products are coated with some type of plastic polymer coatings to reduce the rate of N release.

Natural organic fertilizers include sewage sludges, composted manures and tan kages, hydrolyzed poultry feathers. Green-Relief is composed of a biostimulant growth complex with minor fertilizer elements and plant extract concentrate added.

Dr. Gil Landry, University of Georgia

Reliable Polyon fertilizers

According to the company, Pursell's Polyon fertilizers are the most reliable controlled release fertilizers to buy because temperature is the only factor that affects the release of nutrients.

Using a patented coating to guard against early release, the product gradually meters out the nutrients to ensure greener turf for a longer period of time.

For more information, call 800/334-8583 and report seeing Polyon in LM, or

Circle No. 290

Contec new from Scotts Company

The introduction of Contec controlled-release fertilizer in 1998 will offer more fertilizer flexibility for turf managers than ever before. Contec is the new complete line of homogenous methylene urea turf fertilizers from The Scotts Company. Contec "Premium," Contec "High Performance" and Contec "Complete Course" provide turf managers a methylene urea that will respond in the cool spring and late fall. Contec will also provide a superior summer fertilizer that will give turf managers excellent results without worrying about burning or foot-printing. Contec has a smaller particle size, more uniform granule, and more particles per square inch, to provide the best coverage, no matter how low turf is mowed. For more information on Contec, call 1-800-543-0006, and mention LM, or

Circle No. 290

Bolster growth with Sustane

The Bolster plant growth supplement from Sustane Corp. comes in water soluble packaging and is also available in liquid form.

The line's products are specifically developed for increased growth under sub-optimal and stress conditions. Be sure to mention LM if you call the company at 800/352-9245, or

Circle No. 291

GoldCote precious for fertilizer

Terra's GoldCote polymer technology delivers an exact controlled release fertilizer function that heeds temperature conditions.

As soil temperature increases, water vapor from the soil passes through the multiple coatings. The resulting condensation and pressure within the fertilizer granule causes a precise and predictable release of nutrients, according to the company.

For more information, tell Terra that you read about it in LM when calling 800/288-7353 or

Circle No. 292

firstTurf Liquid Fertilizers

Tessenderlo Kerley is introducing its firstTurf line of premium liquid fertilizers for turf professionals. The line is made up of the company's N-Sure products that improve nitrogen absorption, increase plant vigor and eliminate burn. Also provided is lasting green with fewer clippings.

To learn more call 800/525-2803 (mention that you saw it in LM) or

Circle No. 293

ESN provides precision nitrogen

Recognizing that climates are different throughout the United States, ESN precision controlled nitrogen from United Horticultural Supply is custom formulated for maximum performance in each of the U.S. climate zones.

According to the company, the steady, predictable release characteristics of ESN result in high quality green turf based on a patented process.

For more information, call 800/847-6417 and note that you saw ESN in LM, or

Circle No. 294

MultiCote controls release

MultiCote from Vicksburg Chemical Corp. is composed of three different high-quality polymer coated fertilizer granules. Soil temperature determines the release rates of the nutrients that provide a constant source of superior turf, according to the company.

For more information, LM readers can call 800/227-2798, or

Circle No. 295 LM

360Z



RIDE ITIT'S SIMPLY THE BEST!

Our HOWARD PRICE 360Z is designed with features that the competition simply overlooked. You can tackle tough jobs with ease and get superior results from the comfort of the operator position. Our floating front axle follows the turf contours to give the driver a smooth ride. It also absorbs ground shock and prevents frame stress and failure. Our offset deck adds a unique trim capability by reaching a little further under shrubbery to minimize string trimming. The wide discharge chute allows free flow of clippings for dispersal. Add our five micro-adjustable anti-scalp rollers and you have a cutting combination that's unmatched.

At HOWARD PRICE, our engineers have gone the extra mile to provide the operator great comfort and superior control. The adjustable hydraulic dampened steering control levers provide a custom setting for the operator while eliminating the jerking motions found in other brands. When you look at the total 360Z package, you'll understand why we say, RIDE IT.....IT'S SIMPLY THE BEST!!



18155 Edison Avenue
Chesterfield, Mo. 63005



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) _____



If you depend on a work truck for a living, do yourself a favor. Depend on Dodge Ram. You'll find Ram offers best-in-class convenience

at 440 lb-ft, delivers more torque than any other diesel you can get.



and capability, making it an exceptionally rewarding choice for business.

New for Ram this year is our exclusive Quad Cab™ model. Twice the doors. Twice the convenience. And behind those



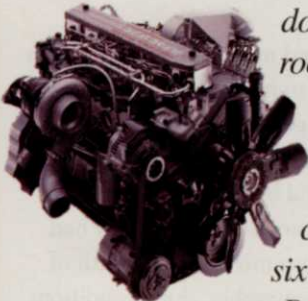
doors? The roomiest cab on the road. Packed with amenities like a fold-down center console and optional six-way power driver seat.

What's more, Dodge Ram has received the J.D. Power and Associates award for "Most Appealing Full-Size Pickup," three years in a row.* Dodge Ram is the first—and only—full-size pickup ever to be honored with this prestigious award.

To make your ownership experience even better, there's our On The Job program, which



offers qualified businesses exclusive cash incentives and financing opportunities. When you work with Ram, we work with you.




But don't let the niceties fool you. Dodge Ram is still a Magnum®-powered beast, with best-in-class available payload and towing. There's even a choice of two V-8s, an awesome 300-horsepower V-10, or a mighty Cummins Turbo Diesel which,

Comparisons based on data available at time of printing.

Always use seat belts. Remember a backseat is the safest place for children.

*J.D. Power and Associates 1995-1997 Automotive Performance, Execution, and Layout Studies™. 1997 study based on 29,187 consumer responses.

Ram  The New Dodge

For more info, call 1-800-WORK RAM. Or visit this work site: www.4adodge.com



Workmen's compensation





Jacobsen Aero King 9672 Aerator flexes to follow turf contours; has 12 aeration wheels for aerating 12-foot width.



Gandy Models 4972 and 4996 feature dual-wheel aerating heads which independently follow ground contour. Both mount on Category One 3-point hitch.



John Deere's 800 walk-behind Aercore features a heavy-duty frame, tine rams, and adjustable operating speeds.

AERATION

Turf aeration gets water and oxygen to turf roots and reduces thatch.

By CURT HARLER

Aeration allows oxygen, water and nutrients to reach down to the grass roots, which is essential to maintaining a healthy, attractive turf. But in order to do a good job of aeration, there has to be sufficient rainfall during the season to assure the ground can be penetrated by the equipment.

This past year, some areas of the country had almost no rain throughout most of the month of August and into early September. Such conditions make it difficult to get the job done correctly.

Nevertheless, "plugging" the turf is worthwhile. Not only does it help even the lightest rain get down into the soil profile, but it also improves drainage and intensifies the decomposition of thatch. This latter is especially important in operations which have moved away from raking and sweeping and gone to mulching mowers and the "let it lay there" philosophy of handling clippings.

It's a good idea to aerate general lawn areas at least once a year. Better maintained areas should be aerated twice, once in the spring and once in the fall. High-management areas, like golf course greens, can benefit from as many as four aerations per season to reduce compaction and improve

water percolation.

A host of effective equipment is available to the grounds manager, whether the job calls for a smaller machine to work around buildings and trees or an aerator to pull cores from fairways and open grounds around office park campuses.

TURFGRASS AERATORS

AGRI FAB, INC.
217-728-8388
Circle No. 250

Plug-type and spiker Agri-Fab aerators are available from Ben Meadows Co., 800-241-6401, and other distributors. The spike aerators are recommended for soils which aren't severely compacted. The spikes form small holes which improve nutrient flow. For high-traffic, clayey or severely compacted soil, go to the core-type aerator. The unit's spoons actually pull plugs out of the soil and leave larger holes. Firm has 32-inch, 40-inch and 48-inch wide units available in weights ranging from 40 to 95 pounds.

your good judgment

Will tell you to select

turf type

Tall Fescue seed from Oregon

the beauty

of the blades

the strength

and durability

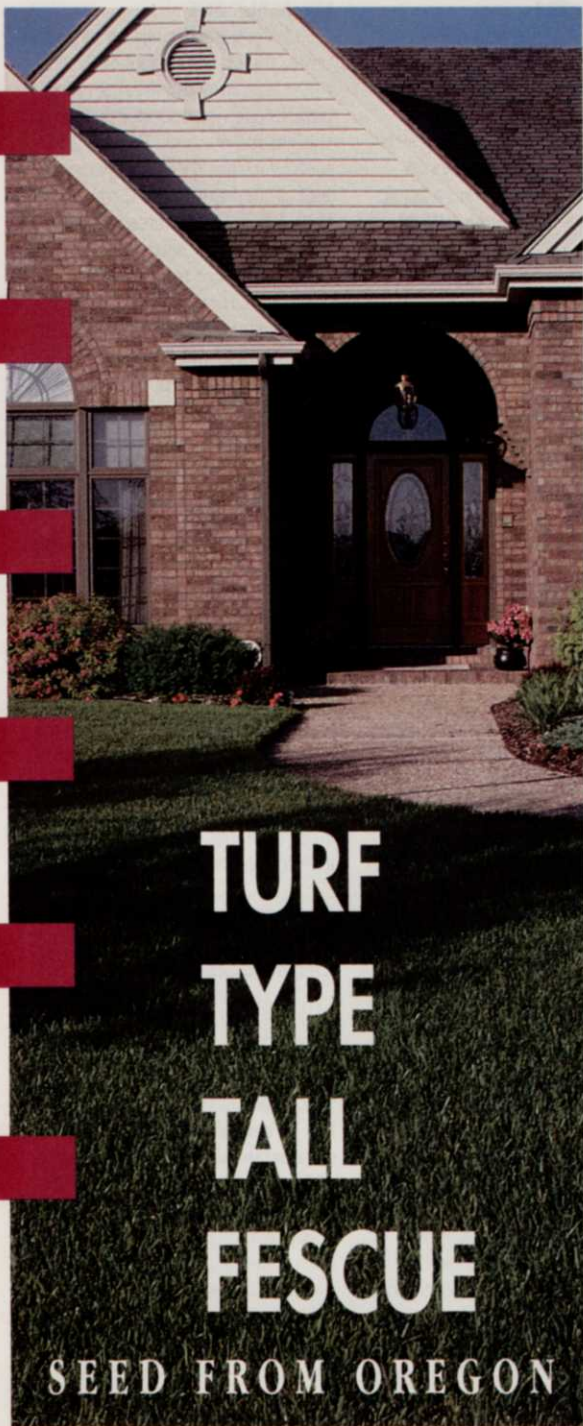
the tolerance

to drought & disease

the quality!

Look for the grown in Oregon label. It puts all others in a lower class. A lush, healthy, deep green turf is your reward for selecting superior seed. The world's leading turf grass breeders have been perfecting it for more than 20 years. The tough, vibrant turf will not only tolerate drought, but survive cold winters.

When you select Turf Type Tall Fescue seed from Oregon you can be sure you will enjoy your "good judgment" decision year after year.



**TURF
TYPE
TALL
FESCUE**

SEED FROM OREGON

Oregon Tall
Fescue Commission
1193 Royvonne, Suite 11
Salem, OR 97302
503-585-1157

AGRI-METAL
819-398-6883
Circle No. 251

The FA 720 Fairway Aerifier from AgriMetal, Wickham, Quebec, Canada is designed for large jobs. Unit has 12 cast iron wheels mounted on six axles working independently to ground follow contours. When pulled behind a 20 hp tractor, its six-foot working width covers up to 50 acres per day. Eight tines per wheel are standard, with 16 optional. The FA 720 cores to a depth of four inches.

BLUEBIRD INTERNATIONAL
303-781-44458
Circle No. 252

Try the BlueBird 742 to cover lots of grounds with a walk-behind unit. Seven rows of tines across approximately 26 inches of working width cover to 37,100 sq. ft. of aeration work per hour. The outer tines on each side of the BlueBird 742 free-wheel, allowing tight turns without tearing turf. Two 36-pound and four 18-pound removable weights distribute weight to improve stability when aerating hillsides.

FELDMANN ENGINEERING
800-344-0712
Circle No. 253

The TurfVent Series Two core aerators includes 3-point hitch models for tractors with category 0 or 1 hitches. The new TV 32-H, TV 40-H and TV 48-H models have effective coring widths of 32, 40 or 48 inches respectively. Made in Sheboygan Falls, WI, all provide coring density of 45 vents per square yard. For big jobs, look into the original 64-H with a 64-inch coring width. All units are built with galvanized expanded metal weight tray base, heavy steel adapter for precise connection to the hitch, and TurfVentor Ejector Tines for 3.5 inch coring penetration.



Grasshopper Aera-vator unit

GANDY COMPANY
800-443-2476
Circle No. 254

Designed especially for large turf areas, the Gandy Model 4972 and 4996 feature dual-wheel aerating heads which independently follow the ground contour. The 4972 has a six-foot width, 4996 covers eight feet. Both mount on a Category One 3-point hitch. Interchangeable coring spoons or slicing knives to core or slice turf to reduce thatch build-up and compaction. An add-on package to convert the 4972 to the 4996 and optional weight trays also are available from this Owatonna, MN, firm.

GRASSHOPPER COMPANY
316-345-8621
Circle No. 255

Designed for 700 and 900 Series power units, the 40- and 60-inch Aera-vator attachments from Grasshopper, Moundridge, KS, aerate turf and relieve surface compaction without irrigation, leaving no cores to clean up. Unit's oscillating action loosens soil between the tines, creating openings for root growth. The 40-inch Aera-vator can be equipped with either an electric lift or hydraulic deck lift. The 60-inch model requires hydraulic.

JACOBSEN
414-637-6711
Circle No. 256

Two pull-behind aerators feature sectional design which flexes to follow turf contours and provide consistent aeration. The Aero King 9672 from Jacobsen, Racine, WI, has 12 aeration wheels mounted in six separate sections for aerating a 12-foot width. The Model 6448 features eight wheels in four sections, covering a four-foot path. Both have 72-pound tine wheels to assure penetration even in hard-packed soil. Wheels have sealed ball bearings that require no additional lubrication. Choice of tines and blades allows spiking, coring or slicing compacted turf.

JOHN DEERE
Circle No. 257

The John Deere Aercore 800 is designed for golf courses. It features a heavy-duty frame, tine rams, and adjustable operating speeds. Choose from four aerating speeds. Powered by Kohler Command 18-hp engine with electric solenoid start.



The Toro Company offers two professional turf aerators.

LESCO TURF EQUIPMENT
800-321-5325
Circle No. 258

The Aerator-30 from Lesco, Rocky River, OH, is equipped with a 5-hp Briggs & Stratton IC recoil-start engine. Spoons move in an arc-shaped pattern which shatters and displaces the soil and eliminates glazing of the holes. Since only two spoons are driven into the ground at once, the unit gets deep penetration. The Aerator-30 has an overall width of 30 inches and working width of 28 inches. Each of six 10-inch diameter, quarter-inch disks has five spoons, for a total of 30. These 5/8-inch spoons are made of high-carbon heat-treated steel.

PALMOR PRODUCTS
800-872-2822
Circle No. 259

There are three models of Trac-Vac core plug aerators to choose from Palmor Products, Thorntown, IN. The 352 has 32 tines and a 32-inch width, 358 has 48 tines and 48-inch width, and the 364 has 96 tines and 64.9-inch width. Units penetrate up to 2.5 inches. The offset drawbar may be rotated to accommodate varying tractor drawbar heights. The 16-inch frame holds standard blocks, both Cat-1 and Cat-0, with a 3-point hitch kit available.

RYAN LAWN CARE
800-228-4444
Circle No. 260

The Lawnaire 28 aerator is a walk-behind unit which covers up to 24,000 square feet per hour. Powered by an 8-hp 5-cycle OHV Kawasaki single cycle engine, this 400-pound machine has a zero-turning radius provided by a tricycle front wheel designed for easy maneuverability. It cuts up to 12 holes

per square foot and has a working width of 28 inches. Several other units are available from the 19-inch Lawnaire IV to large tow-behind and 3-point hitch units which core 36 inches at a pass.

THE TORO COMPANY
612-888-8801
Circle No. 261

A 4-hp Briggs & Stratton IC engine powers both of the aerators in Toro's Turf Maintenance Equipment line. The Bloomington, MN, firm offers the Toro 244 with four rows of six tines (24 total). Fold-down handle provides easy transport and storage. Lift handles on both sides of the machine make loading easier. The larger 442 Aerator has seven rows of six tines (42 total). Its unique, free-wheeling outer tine design makes it easier to turn and maneuver than competitive units. Removable weights are available for both machines.

TURF-R-ATOR
414-639-2516
Circle No. 262

Get fast, dependable aeration performance with the Turf-R-Ator line, manufactured in Racine, WI. Available as a pull-behind or a 3-point hitch mounted unit, it is built on a 54-inch by 27.5-inch frame. There are 8 slice or spikes on each quarter-inch by 22-inch solid wheel. Each machine has nine wheels on six inch centers. Built for minimum maintenance, these tough machines have nine half-inch ball bearings. They give a good, clean cut with no unnecessary clean-up after the job. **LM**

These questions came straight from the customers of lawn care operators, pest control operators and other professional pesticide applicators across the country—and probably reflect the concerns of your customers. The more your customers know about the products you use, how you use them and how much is used, the more confident they will be in you and your service.

Communicate With Your Customers

Your customers expect you and your employees to be credible and knowledgeable sources of information about your products. Take time to talk with them about your safe and responsible use of pesticides.

Studies show that most people don't know that pesticide products are among the most highly tested products sold. The U.S. Environmental Protection Agency (EPA) registers only those uses of pesticide products that pose minimal risks.

- Emphasize that pesticide products must undergo stringent government-monitored testing before they can be sold. It is a long and costly process. For example:
 - It takes a chemical manufacturer eight to 10 years to test and register a product, at an average cost of \$30 million to \$50 million.
 - As many as 120 tests or more are performed, many specific to health, safety and the environment.
 - Only one potential pesticide in 20,000 makes it from the research lab to the market.
- Explain Integrated Pest Management (IPM) to your customers. Most do not fully understand the concept. Point out that a successful IPM program stresses prevention, pest identification and selection of the best method of pest control, which may require the use of pesticides. Tell how you incorporate IPM into your pest management practices.
- Identify the specific pesticides you use and the pests they control.
- Indicate that professionals use an array of products, many the same as those used by homeowners.
- Assure customers of the benefits pesticides provide for turf, trees and ornamentals, and in the home. For example:
 - Termites cause over \$1 billion in structural damage each year.

"Are the pesticides you use safe?"

"Are the pesticides that professionals use stronger and more toxic?"

"When is it safe for my children and pets to return to an area after a pesticide application?"



- One large, pest- and disease-free tree has the same cooling effect as 15 room-size air conditioners.

- A well-maintained lawn and landscape adds as much as 15 percent to a home's value.

- Discuss your safe and responsible use of pesticides as a professional applicator. Note the many steps you take to ensure that the pesticides you use are used properly.
- Advise your customers that you closely follow label instructions. The label contains instructions for only those uses approved by EPA.
- Outline the extensive training that is mandatory for professional applicators in order to apply specialty pesticides. Applicators are required by law to undergo training, certification and licensing, as well as to keep records of each job performed.
- Explain what happens to pesticide containers once a job has been completed. Note that containers are disposed of properly.

What Else Can You Do?

Provide your customers with materials such as newsletters, brochures, fact sheets and bill stuffers that communicate these messages. Be sure that someone at your company, who has a basic knowledge of the products and application methods your company uses, is available to answer questions.

RISE Is A Resource

RISE is the voice for the specialty pesticide industry. Its members include manufacturers, formulators, distributors and other industry leaders.

RISE works in cooperation with your national, state and local user/applicator associations and is an additional source of information regarding issues facing pesticide users. We can help you in your role as a knowledgeable and credible information source to customers and to the public. A brochure on communicating about pesticides with your customers is available. Contact RISE to receive your copy.

We urge you to take an active part in your state and national association(s). We work together to support your business.



Responsible Industry for a Sound Environment®

Native or adapted plants: does it matter?

Before we fill our landscapes with 'native' plants at the expense of imported species, we should ask ourselves one question: Which is more important, the origin of the plant or its characteristics?

by H. S. STEVENS



With the increased emphasis on water conservation and reduced use of fertilizers and pesticides during the past few years, the popularity of native plants has grown by leaps and bounds, and rightly so.

Properly selected, native plants are attractive, require little maintenance, and are long lived. Native plant societies have a lofty and worthwhile goal: to preserve and protect the plant species and habitats that add natural color and beauty to our environment. Individuals who choose to grow only native plants are also to be commended. They are preserving species and helping the environment. Nevertheless, the idea that native plants are necessarily tougher, better adapted, and more resistant to insects and diseases than other plants is only partially true. It's certainly correct that plants native to a particular area are adapted to local soils and growing conditions.

▶ For example, plants that are native to acid, sandy soils are not going to grow satisfactorily in alkaline, clay soil.

▶ Plants that are native to frost-free coastal areas are not going to withstand northern winters.

▶ And plants that are native to dry, arid regions are not going to thrive in low areas or those with exceptionally high rainfall. These are the reasons that native plant societies and the National Wildflower Research Center recommend specific varieties for specific areas. But, does this mean that natives are the only plants that will thrive in each part of the country? Of course not. Hundreds of introduced species are just as adaptable, just as care-free, and, in some cases, much more attractive.

In my own yard and garden, I have Japanese cucumbers, South African Cape Honeysuckle, Chinese juniper, New Guinea impatiens, African marigold, Asian hyacinth bean, California poppies, English daisies, Persian ivy and European lettuce, along with violets my wife, Lorna, dug on Long Island, and daisies and hostas from her brother's home in Iowa. All have thrived in our Texas landscape.

Chinese pistache, Russian sage, Dutch tulips and hyacinths, Japanese honeysuckle and Iceland poppies also do well here. Our native plants, such as coral honeysuckle, Texas sage and purple cone-flowers, have fared no better.

Choose flowers by shape, shade or sun tolerance, hardiness, disease/insect resistance, and moisture and pH requirements.

The many species of low-care plants that have been introduced from other areas or other countries that are on display at arboreta and botanical gardens throughout the nation are evidence enough that native plants are not the only ones that can thrive with minimum use of water, fertilizer and pesticides.

If you or a client want to "go native," by all means do just that. It is a philosophy above reproach. On the other hand, if a plant's appearance and ease of maintenance are the main objectives, forget geographical boundaries. The most important considerations are size, shape, shade or sun tolerance, hardiness, disease and insect resistance, and moisture and pH requirements. These are the qualities that make the plant adapted to your particular growing conditions, and they are available in introduced and adapted species just as they are in natives. **LM**



My fairways never looked better or healthier, and my fungicide budget went down, too.

*- Bruce Burchfield
Fox Run Golf Club
St. Louis, Missouri*



Our turf is good, we're not sodding, and we're not spending huge amounts of man hours to babysit greens through the stress period.

*- Wayne Mills
Valencia Country Club
Valencia, California*



**Now You Can Use Less Fungicide Per Application,
Cut Your Costs, And Get Greener, Healthier Grass, Too.
Just Turn The Page To Find Out How.**





WEEK 1



WEEK 2



WEEK 3



WEEK 7



WEEK 8



WEEK 9

Switch To A Reduced Rate* Daconil U For A Great Looking Course V



golf courses around the country. Now, more and more superintendents are discovering that Daconil Ultrex fungicide, with its exclusive Super

Thanks to their unmatched sticking and staying power, Daconil® fungicides have long demonstrated superior broad spectrum disease control at

Weather Stik™ formulation, sticks and stays so well, you can use it at much lower rates* on a regular 7 to 10 day, preventative schedule for even better results.

Why a preventative schedule? Because disease can already be at work, doing damage to your turf well before visible symptoms appear. Even if you react at the first signs of disease, you could be reacting too late, and your grass might never fully recover. But a preventative



WEEK 4



WEEK 5



WEEK 6



WEEK 10



WEEK 11



WEEK 12

Ultrax[®] Short Interval Spray Schedule Week After Week After Week.

program stops disease before it can start, and that's one reason this approach makes so much sense.

You also put down less fungicide at any one time, which club members will love. You can eliminate systemics to cut total fungicide use and save money. And above all, you get great looking grass. In fact, we guarantee you'll be happy with the results, or we'll give you enough Daconil Ultrax to respray your course using your old program.[†]

Just ask your distributor for all the details. And if you're still not convinced, ask to take the Daconil Challenge, and get enough free product to try this program on a green, tee, or fairway for an entire season. Daconil Ultrax reduced rate spraying. It could put you on a better course than ever before.





DACONIL ULTREX

after a 1/2" rain stress (SEM - 500X)^{††}



GENERIC FUNGICIDE

after a 1/2" rain stress (SEM - 550X)^{††}

See For Yourself How The Stick And Stay Power Of Super Weather Stik Makes Reduced Rate Spraying Possible.

Scanning electron microscopy of treated plant samples lets you see for yourself just how much better the Super Weather Stik formulation of Daconil Ultrex sticks and stays compared to the generic competition. And it's that stick and stay difference that makes Daconil Ultrex reduced rate spraying possible. So if you're tempted to try a similar program with some generic, just remember that the very thing that makes these reduced rates effective is the very thing generics lack — the sticking and staying power of Super Weather Stik. Of course, with Daconil Ultrex, you also get exceptional

handling, superior mixing, and easy packaging disposal with no containers to triple rinse. And remember, too, there's never been a documented case of disease resistance to a Daconil brand fungicide in over 25 years, which means you can continue to count on Daconil Ultrex for top disease control — one more good reason to put our reduced rate Daconil Ultrex short interval spray program to work for you.



Always follow label directions carefully when using turf and ornamentals plant protection products.
 ®Registered trademark of ISK Biosciences Corporation. ™Trademark of ISK Biosciences Corporation.

*For best results, we recommend using 20% lower application rates on a 7-10 day schedule. Section 12(a)(2)(G) of FIFRA provides that it is unlawful for any person "to use any registered pesticide in a manner inconsistent with its labeling"; quoted language is defined in section 2(ee) of FIFRA and expressly excludes the act of "applying a pesticide at any dosage, concentration, or frequency less than that specified on the labeling unless the labeling specifically prohibits deviation from the specified dosage, concentration, or frequency." Thus, in the absence of specific label prohibitions, it is not unlawful under section 12(a)(2)(G) to use a registered pesticide at a dosage, concentration, or frequency less than that specified on the labeling of the pesticide.

User must have label in possession when applying these rates.

†For a copy of our Daconil Ultrex Super Weather Stik Guarantee, write to Daconil Ultrex Guarantee, ISK Biosciences Corporation, Turf & Specialty Products, 1523 Johnson Ferry Rd., Suite 250, Marietta, Georgia 30062

†† Micrographs have been colorized for demonstration purposes.

Our irrigation source is a lake that is plagued by clay, silt and other debris during the year. The lake is 1.12 acres, and over the past 10 years, it has silted in from a depth of 15 feet to its current depth of four feet. Hence, the need for dredging. Here's how we did it:

Prior to dredging, permits had to be granted from the Army Corps of Engineers, the Environmental Protection Agency, Department of Environmental Quality, Unified Sewage Agency, Division of State Lands, the City of Beaverton and Washington County.

The permit acquisition stage took us about 18 months!

Bids were then received from three dredging companies, and ranged from \$80,000 to \$250,000.

The winning bidder brought in two 80,000-pound cranes to set the dredge into the lake. Pipes were laid in the lake to a

settling pond about a quarter mile away.

A weir system was set up at the settling pond to allow silt and mud to settle out prior to returning the water into the lake.

Cutting heads on the dredge pumped mud and silt through the pipes to the settling pond for about three months.

During this same period, we were also installing a new irrigation system. The suction line for the intake to the irrigation system is a floating 18-inch screened head, placed in the middle of the lake. It needed at least three feet to set in and four-five feet of draw down. We elected to dredge the lake to a depth of 13 feet. According to our calculations, this depth would give us six days of irrigation resources without outside flow into the lake.

We pumped 7500 cubic feet of silt and mud out of the lake. Upon completing the dredging,

[GOLF]

PAGE 4 G ▶

Vinyl wall solves erosion problem

PAGE 6 G ▶

Supers focus on greens fertility

PAGE 10 G ▶

The grow-in: putting it all together

the contractor returned one year later to smooth out the silt/mud settling ponds used for storage. We now have cleaner water and a greater storage capacity.

Forrest Goodling is superintendent at Portland Golf Club, Portland, Ore.

Want to be a *Think Tank* guest columnist? We want to know about a project you recently completed, or how you solved a particular management problem. Mail an inquiry to: The Editors, LANDSCAPE MANAGEMENT, 7500 Old Oak Blvd. Cleveland, OH 44130. Fax to 440-891-2675. **LM**

[SUPERS ON COURSE]

Earl Millett is the new president of the MetGCSA. Millett is superintendent at Ridgeway Golf Course, and has been involved in the association for 21 years. "I started on the ground floor and worked my way up through the chairs," says Millett. "This has enabled me to see how—and what it takes—to run one of the finest superintendents associations in the nation."

José Garcia is the superintendent at Borrego Springs Resort & Country Club, which opened on January 2. Garcia was last with Caba del Sol, a Jack Nicklaus-designed course near Baja, Mexico. Borrego Springs has 100 acres of turf and four lakes, and is landscaped with native desert vegetation, including 350 mature date palm trees.

Dredge lakes for cleaner water, greater capacity

FORREST
GOODLING

Guest columnist



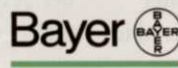
*We never said you wouldn't see unattractive spots
on your course. They just won't be dollar spots.*



Just a reminder that BAYLETON® Fungicide is still the most proven dollar spot control and tank-mix partner around. Because the last thing your course should do is clash with golfers. For more information, contact Bayer Corporation, Garden & Professional Care, Box 4913, Kansas City, MO 64120. (800) 842-8020. <http://usagri.bayer.com>



ALWAYS READ AND FOLLOW LABEL DIRECTIONS
© 1998 Bayer Corporation Printed in U.S.A. 98S10A0066



Circle No. 104 on Reader Inquiry Card

Vinyl wall solves erosion problem

Look to this case study for a way to solve extensive creek erosion with long-lasting vinyl bulkheads.

Joe Stegman, superintendent of Bent Tree Golf Club, Columbus, Ohio, used vinyl bulkheads to solve a big erosion problem.

Bent Tree Creek curves close to the front side of the course's fifth green.

Three consecutive rainy seasons caused the creek to cut a channel to within a few feet of the front edge of the green, 10 feet from its original course three years ago.

Portable Piers, Inc., Muncie, Ind., supplied the bulkheads. It had been installing vinyl bulkheads to control waterfront erosion problems for 10 years. Vinyl is better than concrete, wood or steel in these situations, says Dan Hickle, president of Portable Piers. "You can't keep going back every few years to take care of the maintenance problems, and erosion is getting to be an enormous problem."

Hickle recommended a vinyl bulkhead, backfilled with stone and sodded over, to complete an environmentally sound reconstruction of the creek bank.

C-LOC, made by Crane Plastics, Inc., Columbus, Ohio, was chosen for its strength, durability and cost-effectiveness. One-foot-wide exterior grade vinyl panels are recycled from 89 percent post-industrial regrind. They interlock to form rugged sheet piling walls that are attractive and do not need maintenance.

Easy transport

The C-LOC panels are much lighter than wood or steel, and can be delivered to



After the fill had settled, it was topped with soil and sodded.

a site without harming the turfgrass with heavy delivery trucks and pile-driving rigs. Hickle's crew moved the panels to the fifth green from the parking lot on a golf cart fitted with a pick-up bed.

According to C-LOC, the vinyl bulkheads cost less over its warranted, 50-year life than wood piling materials, and does not require heavy-duty pile-driving equipment for its installation.

The up-front cost is about 15 percent more compared to using non-warranted 2 x 10-inch tongue-and-groove treated timber. It is possible to buy 2x10-inch treated timber with a 20-year warranty, says C-

LOC, but it is more expensive. C-LOC is close to the price of warranted, 2 x 10-inch treated timber.

Within three months, the repair was not noticeable, much to the relief of golfers who had started to dread the fifth hole as a "black hole" for golf balls.

Bent Tree was voted the Columbus area's best golf course in 1996. In 1997, *Mid-Ohio Golfer* magazine said it was the best conditioned course in central Ohio for that season.

How Bent Tree installed vinyl bulkheads

1) 24-foot long, one-foot wide panels were cut to length, and driven six to eight inches into the silt with a sledge hammer. The panels interlock.

2) Panels were trued with a level and driven one at a time into the creek bed along the creek's original bank line, until they formed a large arc the length of the eroded area. Each panel was cut to a finished height of eight to 10-feet to bring them level with grade.

3) Deadmen were driven into the existing bank, and secured to tieback rods, which were also bolted at the other end to the two horizontal rows of wales that provide reinforcement to the exterior bulkhead wall.

4) Final step was to backfill the washed-out area between the new bulkhead and the eroded bank with 600 tons of #34 stone, fill dirt, finished with sod.

Dan Hickle specified the stone to make sure that runoff water that forms behind the bulkhead could find its way through the panels into the water course without building up back pressure that would stress the assembly. The four-man crew finished the job in eight days.

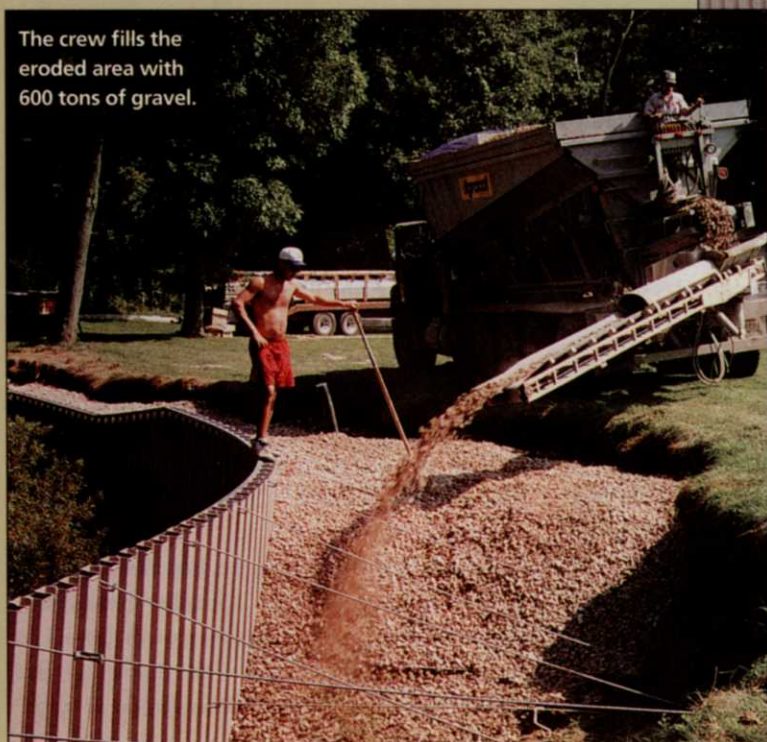
After three years of heavy rains, Bent Tree Creek had eroded its banks by 10 feet.



The construction crew bolts the top wale in place, working from one end of the wall toward the other.



The crew fills the eroded area with 600 tons of gravel.



Greens fertility focus

Tennessee superintendents want control of how much nitrogen their greens get and when they get it.

By RON HALL/ Managing Editor

Superintendents must manage fertility to provide healthy bentgrass greens to their golfers. Even so, fertility's importance shouldn't be over-emphasized at the expense of other vital factors.

"It's easy to zoom in on one thing," said Lynn Ray, CGCS. "But, anytime you talk about bentgrass greens, I think it's critically important to remember that our successes or failures are based on a multiple series of factors. That list is pretty lengthy."

It includes a green's exposure to sunlight, air movement, drainage, the amount of traffic it receives and many many others, said Ray.

Even so, a panel of turfgrass professionals, including several veteran superintendents, "zoomed in on"

on fertility for bentgrass greens at the Tennessee Turfgrass Conference in Nashville earlier this year.

"In general, our fertility inputs are based on soil and tissue testing," said Ray of the Golf Management Group which cares for the turf at three central Tennessee golf facilities. Ray described soil and tissue tests as "tools and not saviors."

Soil tests reveal "the store house:" of materials available in the soil, he said. Tissue tests provide a "snapshot" of how much of the essential nutrients, nitrogen included, are in the bentgrass.

Data from these tests are matched against turfgrass performance over a period of time to provide "a chart of history," said Ray. This allows managers at each facility to more accurately gauge the fertility needs of their greens. This is important because the greens of one course—because of different varieties of turf, soils, traffic or other factors—may require differing amounts of nutrients from the greens on a neighboring course.

For instance, the Penncross bentgrass greens on one of the three courses managed by Golf Management Group gets 2¼ lbs. of N, ½ lb. P, 6 lbs of K and 28 lbs. of gypsum per 1,000 sq. ft. each season. SR 1020 greens at another course get 2 ⅞ lbs. N, ½ lb. P, 8 ½ lbs. K, and 25 lbs. of gypsum, while the third gets 2 lbs. N, ⅓ lb. P, 6 ⅞ lbs. K, and 15 lbs. of gypsum.

At least in central Tennessee, Ray likes to apply ⅓ of the N to the greens from September through January, which mirrors the bentgrass growth curve. His goal is to grow bentgrass roots. "The shoots will take care of themselves," he said. Generally, the N is ap-



Lynn Ray, CGCS, says the greens on each course require a fertility program just for them.

Proper soil pH vital for fertility

Maintaining a soil pH between 6 and 7 on bentgrass greens allows the turfgrass to take up and use the greatest percentage of applied nitrogen, said Dr. Richard Large, A & L Analytical Laboratory, Memphis, Tenn. Theoretically, it should approach 100 percent, but some nitrogen is lost to factors like volatilization and leaching.

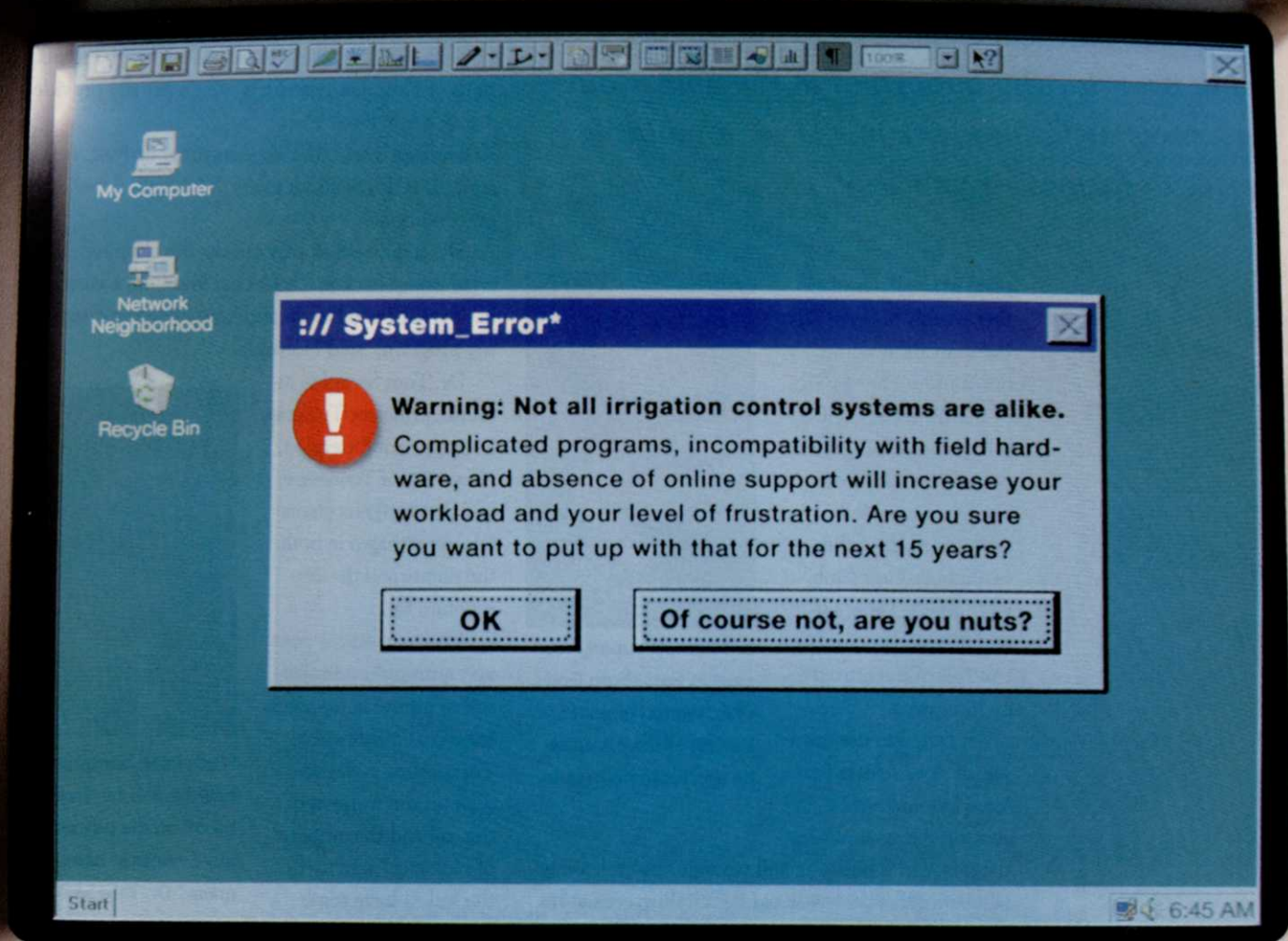
When the soil pH drops to 5.5 the nitrogen uptake drops to about 53 percent efficiency, and at 5 it's just 35 percent, said Large at the Tennessee Turfgrass Conference.

"You've got to keep that soil pH in the proper range. If it's not, you're fighting a losing battle from the start," said Large. "Of course, you can always put on more N, and you'll get some improvement, but not the improvement that you're expecting."

Large also cautioned against approaching the summer with too much nitrogen on bentgrass greens. "You're getting that plant susceptible to other stresses. Insect stresses. Disease stresses. Possibly even heat stress," said Large.

Large said that when his laboratory averaged the percent of nitrogen in plant tissues from golf courses in several states, it discovered that samples from Tennessee and Kentucky ran 4 ¾ percent nitrogen in plant tissues, while those from Missouri averaged 2 1/2 percent.

"We feel it (amount of nitrogen) should be between two and three percent going into the summer," said Large who also advised turfgrass managers that "you do need to experiment with different sources and see which sources work well for you."



COMPARE THE SITEPRO CENTRAL CONTROL SYSTEM TO ANY IRRIGATION CONTROL SYSTEM

You'll find there's no comparison. SitePro™ has better graphics, more flexibility, and more options – designed and tested by customers like you. Plus, SitePro is backed by technical support that's always within easy reach. Ask your Toro distributor for a demo or visit us at www.toro.com/golf.



"Anytime you talk about bentgrass greens, I think it's critically important to remember our successes or failures are based on a multiple series of factors"--Lynn Ray, CGCS.

plied in small doses, either weekly or bi-weekly. "We can always put down more," he said.

Jeff Rumph, CGCS, follows a similar philosophy of "spoon-feeding nitrogen as needed, when needed" at the Gatlinburg Golf Club, Gatlinburg, Tenn. He said he wants "complete control" of the nitrogen on his greens.

"If I tried to use some sort of slow-release material I would not be comfortable as to when the nitrogen is releasing and when it's not releasing," said Rumph. The 4-year-old Pennlinks greens at his public course (about 35,000 rounds annually) got 4 lbs. N, 1½ lbs. P, 6 lbs. K in 1997.

Everett B. Holzapfel, III, superintendent at Jackson Country Club, Jackson, Tenn., said he learned a lot from a GCSAA's 2-day Plant Nutrition and Fertility Seminar.



Everett B. Holzapfel, III, keeps N down to 1/10 lb. every 7-10 days when summer's heat arrives.



Jeff Rumph, superintendent at Gatlinburg Golf Club, wants complete control of the nitrogen he applies to his greens.

He said he has built his greens fertility program on four keys:

- 1) Knowledge of the needs of the grass plants.
- 2) Knowledge of the soil fertility, chemistry and soil test results.
- 3) Knowledge of fertilizer and the fertilizer carrier.
- 4) Amount of experience as a turfgrass manager.

From November through February, he

uses an IDBU fertilizer on his greens. From March through mid May he will use some granular applications of Nutralene products which usually provide a 4-to-6-week feed.

Holzapfel said that once summer arrives, he will spray 1/10 lb. N about every 7-10 days, depending on conditions.

He said he constantly checks the clippings his crew brings back in. "It lets me know on a weekly basis what I need to do and how I need to change my program," said Holzapfel.

Dr. Tom Samples, associate professor Turfgrass Management Extension, University of Tennessee, said that turfgrass plants take up nitrogen in both the nitrate and the ammonium form.

Microorganisms convert ammonium in the soil to nitrate in a process known as nitrification. This process is dependent on the warmth of the soil and the amount of biological activity in the soil. "I have some questions in terms of how quickly the ammonium is converted to nitrate in the soil," he said.

Regardless, Dr. Sample said that nitrogen is taken up very quickly by plant tissue compared to the uptake of phosphorus.

Responding to a question from a superintendent in the audience wondering whether it's possible to control *Poa annua* with applications of nitrogen, Dr. Sample responded, "Let's keep the bentgrass healthy and fertilized based on the nutrient requirements of the bentgrass, and not jeopardize the performance of the bentgrass based on trying to control *Poa annua*."

He also urged superintendents "to keep an eye" on secondary nutrients, particularly if the nitrogen is high in their turfgrass tissue samples.

"I think that magnifies the need to monitor what's going on with calcium and magnesium," he said. □



"Let's keep bentgrass healthy and fertilized based on the nutrient requirements of bentgrass," Dr. Tom Samples.

A TURF HERBICIDE



YOU CAN LIVE WITH

As a golf course professional, it's your responsibility to make the right choices. Right for the turf, and for the people who enjoy it. One way to meet that responsibility is with Dimension® turf herbicide.

Dimension provides season-long control of crabgrass and over 20 other tough grasses and weeds, with excellent safety on established turf. And Dimension does it without staining, or harming

adjacent ornamentals. That means no more weed "fringes," because you can apply Dimension with confidence right up to the turf's edge, even around walks, drives, and landscaping.

Dimension's low use rates and favorable environmental profile mean less worry. The active ingredient features very low toxicity to mammals, birds, and insects. Plus it bonds to soil particles instead of leaching into groundwater.

Dimension offers the widest application window—6 weeks more than other preemergence products. That lets you delay application for optimum control of goosegrass and other weeds. And split applications can stretch control even further for areas with long growing seasons. It all adds up to a turf herbicide that only weeds find hard to live with.

Call 1-800-987-0467 or visit us at www.dimensionpro.com to learn more.



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.
DIMENSION® is a registered trademark of Rohm and Haas Company.
©1997 Rohm and Haas T-O-227



Circle No. 133 on Reader Inquiry Card



Super puts the pieces together for grow-in

Sand Ridge opens soon in Chardon, Ohio. Superintendent John Zimmers has been active in the project from the first day.

by TERRY MCIVER / Editor-in-chief

John Zimmers prepares for Sand Ridge Golf Club's grand opening on June 1, and he says being on-site during the process has helped him learn the layout, save money, and spot potential problems early.

"I've learned a lot, and I wouldn't want to do a grow-in unless I could be there at the very beginning," says Zimmers of his first grow-in. "You avoid a lot of problems if you're there at the beginning."

Having a super on-site during a grow-in is vital if the site is environmentally sensitive.

"If you have a sensitive site, one that contains wetlands, (the superintendent) has to be there to oversee the construction. But it's worth it, because if that dozer operator makes

one mistake, it could be over," as far as violation of federal or local wetlands protection mandates, says Zimmers.

"Federal and local authorities *will* come and inspect," he adds, "and if you have good rapport with them and show them you're doing things with positive intent, things will work out. People have the misperception that they're 'out to get you,' but that's not the case."

Zimmers says he's seeking Audubon Cooperative Sanctuary status for Sand Ridge.

A veritable beach

The soil profile at Sand Ridge does indeed contain sand, but not until you get through about eight feet of heavy clay loam. But there's plenty of the white stuff visible on the surface.

Sand is a key factor in the

design of the course. That's not surprising in that the course was built by the Best Sand company, which has its quarry right next door.

"I think we have over 10,000 tons of sand out here," says Zimmers. "It's quite a different look, especially being in northern Ohio."

Two grades of sand are used for bunkers, a '530' and a '535'.

The greens were built of an 80-10-10 sand/topsoil/peat mix that meets USGA specs. "We took Best Sand's sand, mixed it with topsoil from behind the 14th fairway; shredded it and put in a little bit of the Dakota peat," says Zimmers.

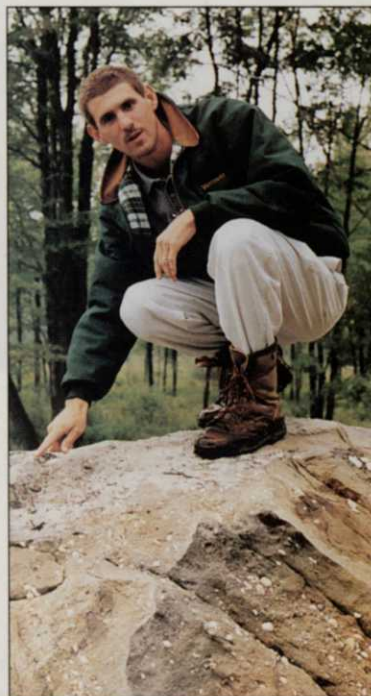
Fertigation for carbohydrate load

Zimmers used the course's state-of-the-art fertigation system to add a sugar/molasses product (Carbo-Aid 3-1-3 from AquAid) to feed the turf.

"We fed the soil with carbohydrates to some

microbial activity, since we disturbed the soil so much during construction."

"The fertigation system gets the carbohydrates out to the turfgrass. Then we use granular organics (Sustane and Nature



Zimmers and his crew unearthed this boulder while building the 12th green. All that was exposed before excavation was a two-foot corner.



IT'S ALL RELATIVE.

The relative size of fertilizer particles dramatically affects their performance. With Scotts' **NEW CONTEC™**

CONTROLLED RELEASE FERTILIZER you get **MORE**

consistent particle sizing, contributing to uniform flow and

*improved spreadability. The result is a **MORE** consistent distribution of nutrients.*



Relatively speaking, Scotts' unmatched tech rep assistance program, full product line and competitive

*pricing means **YOU GET MORE FOR YOUR MONEY, ALL***

OVER YOUR COURSE, ALL THE TIME. 

Contec™ Controlled Release Fertilizer


Call 1-800-543-0006. Or visit our website at www.scottscountry.com for more information.



GOOD HELP THAT STICKS AROUND

Like we need to tell you. We realize that grubs are just one more item on the long list of things you deal with everyday. But MERIT® Insecticide

has such a wide window of application and long residual control, that one application is all it takes to eliminate the very thought of grubs through the fall.

Bayer 

ALWAYS READ AND FOLLOW LABEL DIRECTIONS © 1998 Bayer Corporation Printed in U.S.A. 98S19A0140

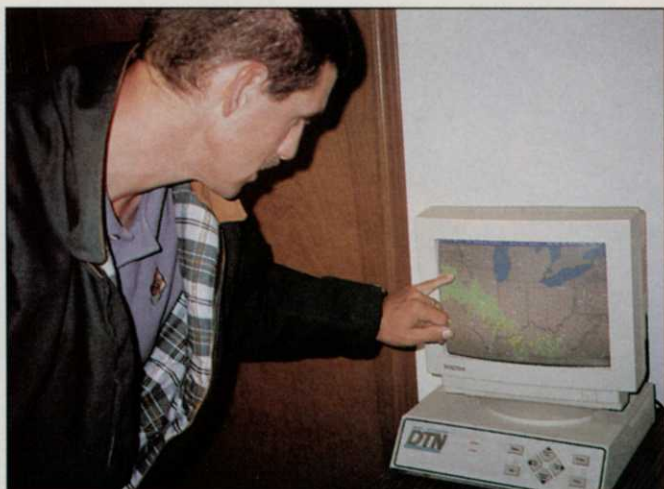


ALL SUMMER IS HARD TO FIND.



Which should be of some comfort. Because you don't need grubs trying to ruin your course. You have enough help doing that already.

For more information, contact Bayer Corporation, Garden & Professional Care, Box 4915, Kansas City, MO 64120. (800) 842-8020. <http://usagri.bayer.com>



With weather radar, Zimmers 'stays ahead' of coming storm fronts. People on the course are safer, and products aren't wasted.

Safe). We used a United Horticultural Supply product (Gro-ganic) for the pre-planting preparation."

The fertigation pump pre-mixes control products.

'Flex-design' works

The scenery at Sand Ridge shifts dramatically from heavily-wooded areas to open ground.

"This is a golf club, and the members are here for one reason--to golf. Tom Fazio designed the course. One of the criteria was to have a 'world

"We're not going to do anything crazy the first year. We want strong, healthy turf."

class' facility," says Zimmers.

"You just can't say enough about Tom Fazio and his two associates, Tom Marzsof and Rick Horger," he adds. "They're just a delight to work with. They stood out here, drew a picture, handed it to the shaper, and said, 'build that.'"

Although they worked from

a detailed plan, they modified it in the field when the terrain suggested a better option.

"Our original plan showed the 16th hole to have two greens; it doesn't have that now," explains Zimmers.

"The 5th hole was supposed to have a lake, and we pulled the lake out and put two greens there."

Low stimps to start

Zimmers won't push the greens speed too soon.

"I think if they stimp around 8 for opening day, I think that's a realistic goal considering that they're so young. Too much emphasis is put on green speeds right away. If they're consistent and we have healthy turf, I think we've done our

job. The rest of the things will work themselves out."

Greens will probably be cut at $\frac{1}{2}$ to $\frac{3}{8}$ inches.

The course is seeded entirely with bentgrass (L-93 for greens; a 50-50 mix of L-93 and Southshore for fairways and tees); roughs are primarily Baron and Preakness bluegrass.

Sand Ridge sides

Smart storage...Zimmers and assistant Jim Roney designed the Sand Ridge chemical storage building, which includes a concrete pit fitted with a drainage pipe to collect spillage into a holding tank. The runoff is later sprayed into rough areas.

All sinks are piped to the pit, and are fitted with easy-to-clean, stainless steel filters.

Every storage building has an emergency alert system and a fire alarm. If you need help, you sound the alarm and someone comes running.

The course has its own sewage treatment plant that recycles water back into the irrigation system.

Turf nursery...John Zimmers relies on a turf nursery for extra sod, and as a training ground.

"Before anybody does anything on the golf course, we bring them over and teach them how cut, spray, and fertilize. We don't want to take a chance on anybody making a bigger error on the course. This has saved a lot of grief. If there's a mistake to be made, it's better to have it made here than out there."

On being a super..."Every day is different. And it certainly is a challenge. Whether it's rain, heat, or equipment. I don't think you're ever done with your job, and you're always trying to make improvements some where."

"I think the key to this business is to be flexible and work hard. And you have to be able to deal with the weather and the people. You're only as good as the people you have."

"Alan Mark and Dr. Rich Hurley (of Lofts Seed) have done a great job of servicing us," says Zimmers. "Before we were even planting grass, they took a great interest in the project and gave us some great insight, to make sure we have the right grass in the right place."

Zimmers also credits Bob Brame, director of the USGA's North-Central region for his help with greens specs.

"On greens, tees and fairways we used $1\frac{1}{2}$ lb./1000 sq. ft. seed rate, and seeded in two different directions: $\frac{3}{4}$ lb. in one direction, $\frac{3}{8}$ lb. at right angles. We've seeded all of our greens and tees ourselves with walk-behind drop spreaders and then we ran a Sand Pro and dimpled it in. The tires dimpled it in.

That was a great turning point. We saw tremendous results with that dimpling.

"I wasn't a true believer till I tried it. It was remarkable."

During the seeding, Zimmers maintained consistent seeding patterns by having one man (John Krebes) be responsible for the project.

Zimmers gives extra credit to Jim Roney (last with Merion Golf Club) for his help during the entire grow-in.

"He's put a lot of long, hard, dedicated hours in," says Zimmers, who gives still more credit to his wife, Tracey, who endures his long days at the course. **LM**

Questions!! Questions!!



**FACT: There is no status quo in grounds management.
You either move ahead or fall behind.**

Question No. 1: What is your profession, and what should you do about it?

Answer: If you are an institutional grounds professional or independent landscape contractor, you belong with the *full range* of your fellow professionals, as represented by the Professional Grounds Management Society, where you are an *individual*, not just part of a member organization. (PGMS is the oldest, most fully inclusive organization of grounds professionals.)

Question No. 2: So, what are the steps to getting ahead?

Answer: Join *and participate* in YOUR professional society
Read Green Industry publications
Attend Educational conferences
Become certified

Let PGMS join you in your future.

We don't just expect you to join us for joining's sake. We're vitally interested in our members' futures. Let us add our expertise and strength to you for your greater attainment.

PGMS Membership Benefits (partial list):



- local branch meetings
- annual conference and Green Industry Expo
- regular national newsletter
- personal ID (membership card, certificate, hats, jackets, decals)
- Certified Grounds Manager program*
 - training manuals
 - discounts — books, rental cars
 - membership directory (Who's Who In Grounds Management)
 - awards
 - information clearinghouse

*Conferred by PGMS, grounds manager certification is a program of developing and administering a program of voluntary peer review to establish acceptable competence levels, and to help the grounds professional attain his personal goals.

BOTTOM LINE

Your industry is moving ahead. Are you moving ahead with it? The only way you really know is if you're involved. If you're in grounds management, you belong with other grounds managers, and not trying to do everything alone.

Take the first step by completing and returning this coupon.



To: PGMS
120 Cockeysville Road, Suite 104
Hunt Valley, Maryland 21031 Tel. (410) 584-9754 FAX (410) 584-9756

PGMS
PROFESSIONAL
GROUNDS MANAGEMENT
SOCIETY

I want to grow with PGMS. Please send more information explaining how.

Name _____ Orgn. _____

Street _____

City/State/Zip _____

Telephone _____

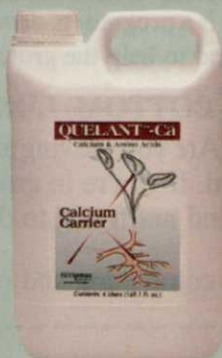
QUELANT™-Ca

Calcium & Amino Acids

CALCIUM DEFICIENCY CORRECTOR

Addition of calcium to the soil by traditional means is not usually efficient or effective in treating the calcium deficiency of turfgrass. Once applied, the common forms of liming materials can rapidly change to compounds that are insoluble in water and not readily available to the plant. Continuous applications over long time periods are necessary to effect even modest improvements in calcium uptake.

Quelant™-Ca is a newly available amino acid chelated calcium product that corrects calcium deficiencies in turfgrass upon application. Quelant™-Ca provides readily available calcium chelated with amino acids so that it is easily absorbed by the leaves and/or the roots of the plant regardless of most soil and water conditions. The unique formulation of amino acids used for chelation was



developed not only to facilitate absorption by the leaves and roots, but to increase mobility of the calcium within the plant as well.

Quelant™-Ca is normally applied as a foliar spray and may also be applied through fertigation. Either way, it is tank-mix compatible with herbicides, soluble fertilizers, insecticides, fungicides and plant growth regulators. It will even help improve the efficiency of most of these treatments by increasing their absorption and translocation within the plant.

Best of all, Quelant™-Ca is economical to use and it protects the environment.

Quelant™-Ca — a true systemic. It's new...it's unique... and nothing else works quite like it!

For more information about Quelant™-Ca call
Nutramax Laboratories' at: 800-925-5187



The Nutramax Company
nutramax
LABORATORIES, INC.

AGRICULTURE DIVISION
Baltimore, Maryland



Days are getting longer. It's no trick of our imagination. This mild El Niño winter is teasing us with dreams of an early and soft spring, something we haven't enjoyed for three, maybe four years here in northern Ohio.

But, no matter when bluebird weather returns, we're going to be moving at warp speed in a few short weeks. We have to be. We can't wait.

Most of us, because our businesses are seasonal, only have 150-170 working days to generate an entire year's income. For ourselves and for our employees too.

So when the ground thaws, we're right on top of it and going 100 mph.

That's why now, right now, we must re-energize ourselves for the approaching season. It's time to refurbish our trucks. To attract whatever seasonal help we'll need. To get sales efforts rolling.

But, above all, let's take one last opportunity to find a quiet place and review with ourselves, or with our family or closest associates, what we want

to get done in 1998.

Many of us will start with our financial goals and that's understandable. We know we can't just line up the trucks and equipment and tell our employees to get at it. We can't just sit back and wait for revenue to come flying in. We've need to have a plan, and practical strategies to accomplish it.

The next few weeks give us one last calm time before season's start to lock our goals into our minds, to write them down, to set up a schedule to return to them and to review them regularly

This will help us begin the spring going in the right direction. Because once the season starts, everything seems to start happening at once.

February gives us one final chance to look over all that we want to get done this year. **LM**

A final chance to get your plans in place for '98 season



Ron Hall

RON HALL
Senior Editor

[LANDSCAPE/GROUNDS]

PAGE 4L ▶

Expand into irrigation contracting

PAGE 10L ▶

Fleet maintenance from the pros

PAGE 18L ▶

Baits effective against fire ants

PAGE 24L ▶

Ohio Turfgrass elects '98 officers

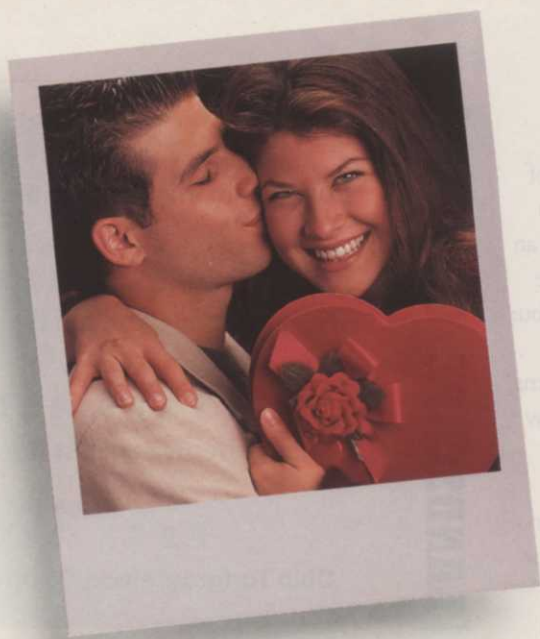
[PEOPLE & PROJECTS]

Arizona firm builds Elephant Rocks

Desert Reflections, a Scottsdale, AZ-based company, now builds golf courses. The company is currently under contract to complete the nine-hole expansion of Elephant Rocks Golf Course in Williams, AZ, designed by Gary Panks. Steve Robison, general manager, leads this division of Desert Reflections, relying on his extensive background with the Wadsworth Company, builders of many fine courses around the world.

Minor getting bigger in Big "D"

Minor's Landscape Services of Fort Worth, Texas, has purchased Graeber & Associates, a landscape management and contracting firm in Dallas, with about \$3.2 million in 1997 revenue, 80 employees. "Our goal as a company is to expand both internally and through strategic acquisitions in the markets we serve," says David Minor, president and CEO of Minor's. The Minor firm will open a third office in the Dallas/Fort Worth metroplex.



With MERIT® Insecticide at the heart of your ornamental insect control program, you can have unsurpassed control throughout the season with just one application. Unlike other insecticides, which require

several foliar sprays, MERIT can be applied as a drench or

injected into the soil where it's translocated from the root

system to the rest of the plant. This systemic action

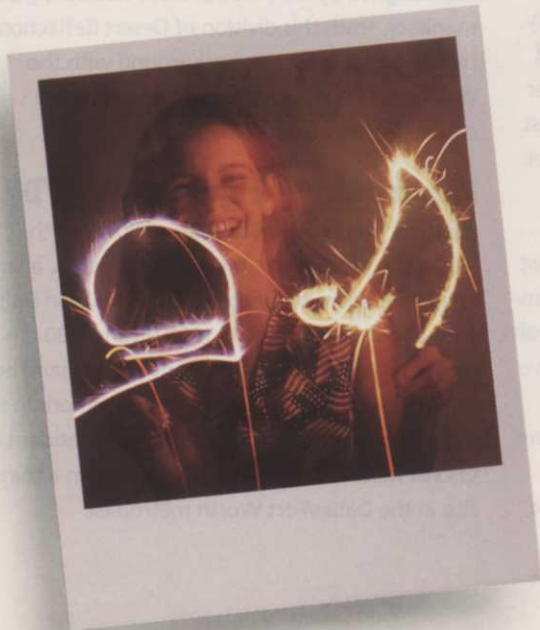
keeps MERIT

in the plant

to provide unsurpassed control of ornamental pests

from spring throughout the summer. Protection that

isn't subject to wind drift, and isn't washed off in



the rain or broken down by the sun's rays. And when it

comes to reducing environmental impact, MERIT

reduces exposure to the applicator, bystanders, pets

and wildlife.



To find

out more, contact Bayer Corporation, Garden &

Professional Care, Box 4913, Kansas City, MO 64120.

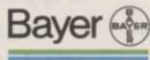
(800) 842-8020. <http://usagri.bayer.com>

And stop

using orna-

mental insecticides that only work

on occasion.



NOW YOU CAN ADD ORNAMENTAL INSECTICIDE APPLICATION TO THAT LIST OF THINGS THAT HAPPEN JUST ONCE A YEAR.



EXPAND INTO irrigation contracting

By BRUCE F. SHANK/ Irrigation Association

Never before has knowledge of irrigation been more important. It can help you take advantage of competitive pressures in the marketplace while expanding your service mix.

Opportunities knock for contractors who install commercial landscapes that include irrigation.

While our dependence on automatic irrigation varies by region, even systems for supplemental irrigation are more common at the commercial and high-end residential level. The connection between image and landscaping has never been stronger.

There are three ways to protect a landscape investment:

- ▶ install adapted plant material according to a practical design;
- ▶ hire skilled maintenance personnel;
- ▶ and install an automatic irrigation system. Exclude any of these three from the landscape budget and you risk the entire investment.

From a landscape contractor's perspective, whether or

not he hires subcontractors for irrigation, a knowledge of irrigation is increasingly important. Growing competition among manufacturers and suppliers is depressing prices and shrinking margins. Smaller margins often translate into less design and technical support from the distributor. The contractor with irrigation expertise, who stays in touch with irrigation distributors and designer/consultants, has the advantage because he is aware of opportunities for profit.

"Irrigation represents almost a third of the cost of most landscape projects for us," says **Jon Ewing**, president of Landtrends Inc., of San Diego, CA. "You either accept the consequences of subcontracting irrigation or make the decision to buy the equipment and learn the business yourself. Most landscape projects that go out for bid include an irrigation plan and

specifications. From our standpoint, the most important thing is to make sure our landscape installation is backed up with a reliable irrigation system, one we can both install and maintain."

Trust has a lot to do with it, says **Glenn Moore**, owner of Glenmore Landscape. "We install primarily golf course irrigation systems. If I hadn't grown up on a golf course (as the son of Sherwood Moore, former golf course superintendent at Winged Foot and the Captain's Club) and installed and retrofitted systems since the age of 18, some people would question my credentials. Superintendents don't hire me because they don't understand irrigation. They hire me because they do, and they'd prefer that my company do it."

"We got tired of losing jobs to contractors with irrigation crews," states **Jerry Maldon-**

◀ The connection between image e and landscaping has never been stronger. Properly installed irrigation builds strong curb appeal.

▶ Jon Ewing, Landtrends, San Diego: "Most landscape contracts that go out for bid include an irrigation plan and specifications."



ado, vice president of Maldonado Nursery & Landscaping, Inc. of San Antonio, TX. "Coordinating our schedule with an irrigation contractor's schedule was frequently complicated. A package deal carries more weight when bids are compared. But, once you commit to a contract that includes irrigation, you'd better have the equipment and skill to pull it off. Just remember to judge irrigation as a separate profit center that stands on its own.

Unfortunately, on the small residential end of the landscape

business, irrigation is still considered so simple that anyone with a can of glue and shovel can do it. On any given Saturday morning, you can find a line of unlicensed "irrigation contractors" lined up at the special contractor check-out line of the discount hardware store. Forget about local building codes and backflow prevention device regulations. Who's going to inspect a homeowner's irrigation system to see if it meets code?

The do-it-yourself and pseudo-contractor market can't

Billion-dollar business

More than 20 million acres of residential and commercial landscaping are irrigated in the United States, according to the Irrigation Association. This includes more than 10 million single-family residences and 450,000 commercial establishments. Each year, contractors receive \$1.2 billion to install residential and commercial landscape irrigation systems, not including another \$600 million spent by retail hardware store customers (many of whom are small or part-time contractors).

Each year, irrigation systems are installed on more than 15,000 new commercial projects and 500,000 new residential landscapes. This does not include installations on existing commercial and residential properties or retrofitting older systems. While the number of companies that concentrate primarily on irrigation installation and maintenance is small (roughly 8,000), about half of landscape contractors either install or maintain irrigation systems. From a regional standpoint, involvement with irrigation ranges from 15 percent in the Northeast and north central United States to 80 percent in the Southeast and Southwest.

Reliance on landscape irrigation is obviously greater in warmer regions of the country. However, irrigation contractors and consultants in cooler regions of the country have found a comfortable business niche. Supplemental irrigation systems are gaining respect and popularity. Landscape architects in these regions are not as familiar with irrigation system specifications as those in the South and West, so they depend more on irrigation consultants and experienced irrigation contractors. This reduces the number of low-budget, under-designed systems.

The prospect for irrigation is bright for both cool- and warm-season regions of the country. Higher standards in housing development favor quality landscaping and irrigation. Even though the number of housing starts is greater in warmer climates, the percentage of existing homes and businesses without irrigation in cool regions represents a great opportunity. Retrofitting older irrigation systems has considerable potential in all regions.

The 600 irrigation distributors in the nation are undergoing the largest transition in the industry. Irrigation contractors used to depend heavily on distributors for product and design support. Today, contractors buy irrigation components from three or more different wholesale sources in their area. Competition is consequently greater and distributors' profit margins won't allow for the type of support they used to provide.

Retail stores that offer wholesale prices to contractors are also putting pressure on prices of irrigation components. *on next page*



"Once you commit to a contract that includes irrigation, you'd better have the equipment and skill to pull it off," says Jerry Maldonado, left, president of Maldonado Nursery & Landscaping, Inc.

cont. from previous page

nents. Brands fight for shelf space like supermarkets. To compete in the retail outlet, manufacturers frequently produce a second, lower-priced grade of product. Check model numbers before you buy. If you need commercial-quality components, stick with the wholesale distributor. You can match mass merchandisers' prices and still get the support of the distributor by buying case lots instead of individual components. Retail outlets rarely have a sufficient assortment of controllers, valves and nozzles for commercial or larger residential work. They also might not have knowledgeable personnel on staff to provide accurate information on meeting codes for irrigation in your area.

Many irrigation distributors offer training seminars for their customers. These are frequently co-sponsored by manufacturers and focus on specific products. Distributors can also introduce you to design software so you can generate plans and takeoffs for common irrigation projects. In other words, you'll need to develop a good relationship with one or more irrigation distributors.

Irrigation as a profit center

Irrigation is a specialty type of contracting more than a separate business. Most irrigation contractors have the word landscape in their company name and treat irrigation as a division, even though irrigation represents the majority of their income.

Irrigation installation typically begins after rough grading. Any changes between plans and the final landscape must be resolved before irrigation crews start. Plant location will be limited by the irrigation in place. Changes add to cost.

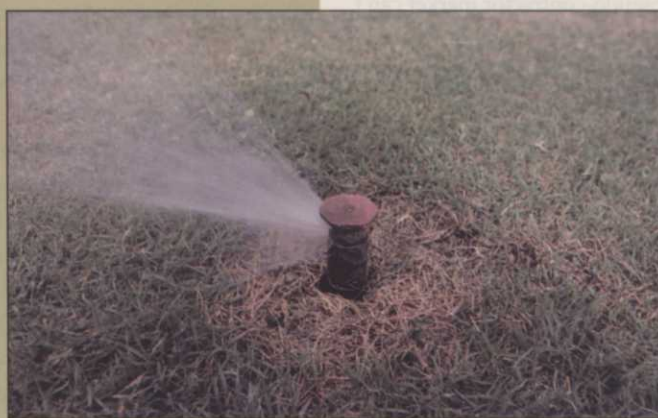
One reason to treat irrigation as a separate profit center is to gauge and reduce the cost of changes. A change on the landscape installation might not be worth the resultant cost of the change on irrigation. One way to control these types of changes is to manage both landscape and irrigation portions of the project. Close coordination between the landscape contractor and irrigation subcontractor also can produce a higher profit.

As a contractor, you have the option of training one crew or all crews for irrigation installation or maintenance. If your landscape installation business is running at full speed, you might want to limit the diversion in energy and attention to a few key irrigation specialists. Of course, it is always very important for an irrigation specialist to have a superior knowledge of plant materials and

be ignored. Retail sales of irrigation components almost matches sales of professional landscape irrigation components through distributors. Sales clerks are designing irrigation systems on paper bags, soon to be filled with fittings, glue, pop-up sprayheads and a four-station controller. If you're lucky, he'll remember to include valves that include pressure vacuum breakers to provide some level of backflow protection. Ask yourself, is it worth chasing a \$600 irrigation installation job?

The purpose of this special section is to put all this into perspective for the landscape

▼ **Irrigation is a specialty type of contracting more than a separate business. Many contractors also do landscaping.**



landscape construction. Mistakes or misjudgments in irrigation can cause maintenance problems later. Unique plant water needs must be considered in all irrigation systems designs. Also be alert to "microclimates" that impact water use, such as shade, slope, soil, or wind exposure.

The difference between landscape crews and irrigation crews is mainly the vehicle and specialized equipment, such as trenchers or borers. The vehicle has to carry many different tools and fittings not generally needed for other landscape work. Efficiency and profit are based on having the materials with the crew at all times so trips back to the office are eliminated.

contractor. Concede the small residential work installed with disregard to local water protection regulations.

Focus on the high-end residential and the commercial work around you, the jobs that go out for bid and are inspected during and following installation. Work in concert with irrigation designers and consultants, distributors, and busy landscape contractors. Develop a record of successes to gain the attention of those who prefer not to be bothered by irrigation.

Most importantly, think like a modern landscape contractor. Consider the profit and repeat work of service contracts. Create an atmosphere of dependence between you and your customers about everything that has to do with landscaping. Be the conduit of knowledge during times of drought, pest infestation, and color, whether flowers or fall foliage. If you can do that, you will have won the battle and built a business foundation that assures a lifetime of prosperity, or at least personal fulfillment, for you and your firm. □

THE NEW BREED OF COST CUTTERS



THE BEST WAY TO GROW YOUR BUSINESS.

To grow a business in today's competitive marketplace you need to watch both sides of the ledger. . . costs as well as sales. That's where Scag commercial mowers can really add to your balance sheet. Take the exciting new Turf Tiger for example. No other mower in its class offers the awesome power and performance of our newest zero turn rider. And like all Scag mowers, it's made to run day after day, season after season, with easy field serviceability, high productivity and consistent quality. And that cuts costs.

If you're looking for better bottom line performance, then you need a mower that offers better maneuverability, precision cutting and faster speeds. A mower you can count on every time you put it on a job. From walk behind and 3-wheel riders to the awesome Turf Tiger, the mower you're looking for is Scag.

SCAG
Simply The Best

Circle No. 135 on Reader Inquiry Card

Scag Power Equipment Division of Metalcraft of Mayville, WI 53050 ©1997. All rights reserved.

You can't clean up this season, if

Dimension® turf herbicide. It's the best value because

of what it *won't* cost you.



Like about \$35

to shampoo a fluffy white

dog. Or \$85

for a white Berber carpet. What's it cost to scrub a



sidewalk? Or to repaint a white picket

fence? You'll learn first-hand, if your turf

herbicide stains those items.



messy yellow stuff could end

And that

up costing

you even more: If it doesn't provide the best control

of crabgrass and other weeds, you could be getting some

unexpected calls from unhappy customers.



ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

DIMENSION® is a registered trademark of Rohm and Haas Company. © 1997 Rohm and Haas T-0-223A

you spend the season cleaning up.

Callbacks, either for stains or weeds, cost you bigtime.

First, you pay



for cleanup. Then you

lose whatever

money you could

have been making instead. Keep your money

(and your customers) with Dimension turf herbicide.

Dimension just can't stain; apply it with confidence



along walks and driveways.

And families can use their lawns as soon

as the dust settles or the spray dries.



You get worry-free weed control, loyal customers,

and a healthy bottom line.



Clean up this season. Call **1-800-987-0467**
or visit us at **www.dimensionpro.com** for complete information.

Fleet maintenance from the pros

By RON HALL/ Managing Editor

Landscape companies can't deliver services without motorized equipment like trucks, mowers, backhoes, and sprayers. The efficient use of these tools allow a landscape company to generate production which, in turn, produces revenues.

Considered from different perspective, production equipment (let's include service delivery vehicles too) is often a landscape company's largest capital investment.

Does a grounds care operation need any better reasons to keep its motorized equipment maintained and repaired?

Michael Rorie, Groundmasters, Inc., Cincinnati, says fledgling landscape companies usually can't afford a lot of hardware. "But once you get to a certain size you start to collect trucks and other equipment." He says that business owners must then make a choice—



Michael Rorie doesn't want to worry about equipment failures.

whether to buy another truck and extra equipment for back-ups, or to invest in a maintenance facility and mechanics to extend the working life and keep present equipment in serviceable condition.

"Equipment is what we use every day. I, as the president of our company, don't want to spend a lot of my time worrying about equipment," says Rorie. He says

most owners' or managers' time is better served focusing on sales and production.

A support role

Rorie and several other landscape professionals and equipment experts discussed fleet and equipment maintenance at the ALCA Conference this past November in Charlotte. This report was compiled from their comments.

First and foremost, a maintenance facility's purpose is to support production. A maintenance shop's "customers" are the company's supervisors and production employees, say the panelists.

"We recognize the shop as

an integral part of a successful team," says Steve Glennon, regional manager for Cagwin and Dorward, a successful San Francisco Bay area landscaper. "It's essential that our mechanics are flexible and that they

have a strong sense of commitment to the organization and to the other employees."

"Our job is to get the equipment out onto the job, working and making money," adds Ken Railey, fleet and safety manager for the Ruppert Landscape Company, Ashton, Md. "When the trucks and equipment perform well, they (production people) are happy. If the trucks and equipment don't perform well, they get frustrated and customer service



Steve Glennon says some tasks performed in-house, some are contracted.

Tips for a productive shop

Ron Turley is a former fleet and safety director at United Parcel Service (UPS). He was responsible for 48,000 vehicles. Today he operates Turley Transportation Consultants, Dewey, Ariz. He consults with government and private industry, including lawn/landscape firms, regarding efficient fleet and maintenance shop operation.

Turley says that managers can only control four things: time, material, space and tools. The best managers know how to blend all four into an efficient system.

For a smooth running maintenance shop, Turley suggests:

- ▶ Develop a good preventive maintenance plan. This is always at the top of his list.
- ▶ Get good people and train them.
- ▶ Make employees realize that you expect 6.9 hours of effort for every 8-hour day.
- ▶ Strive to keep vehicle and equipment availability as high as possible.
- ▶ Standardize as much as possible—equipment, including vehicles, and parts. Items like tires, lights, belts, and filters.
- ▶ Allow 1 ½ service bays per mechanic.
- ▶ Provide employees with enough tools and parts to do their jobs without waiting or searching.

—RH

Walker

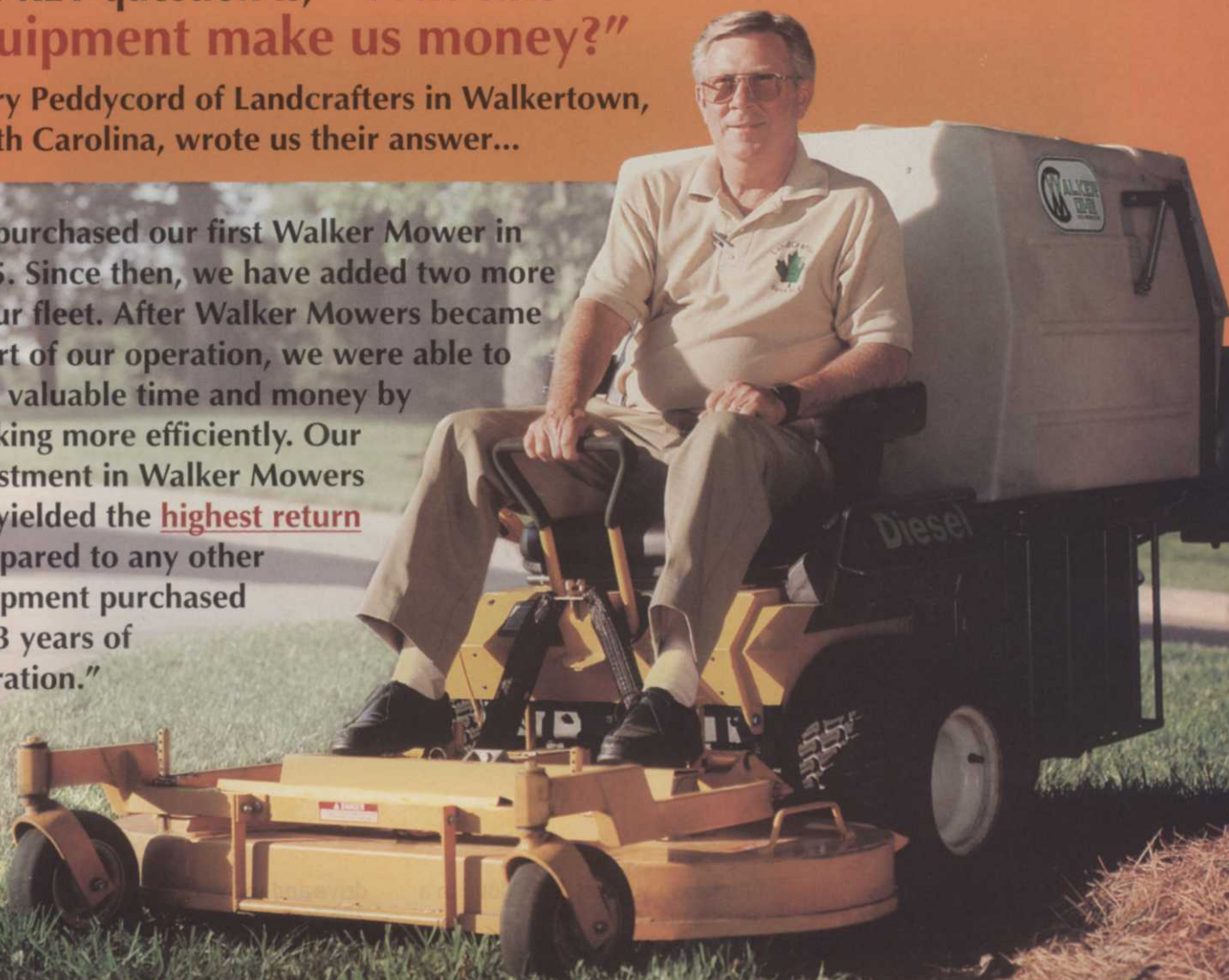
pays back in

Walkertown, North Carolina

The KEY question is, "Will this equipment make us money?"

Gerry Peddycord of Landcrafters in Walkertown, North Carolina, wrote us their answer...

"We purchased our first Walker Mower in 1995. Since then, we have added two more to our fleet. After Walker Mowers became a part of our operation, we were able to save valuable time and money by working more efficiently. Our investment in Walker Mowers has yielded the highest return compared to any other equipment purchased in 23 years of operation."



"It's good to have Walker Mowers on your side in such a competitive market."

—Gerry Peddycord

Try an original...
Buy an original!

Circle No. 142 on Reader Inquiry Card

VIDEO
FREE
AVAILABLE

For your Free video, call 1-800-828-8130, Dept. 028-5. (\$3.95 shipping charge. Visa/MC accepted.) Or send check or money order for \$3.95 payable to: Video Fulfillment Services, 028-5, P.O. Box 385070, Minneapolis, MN 55438. Allow 2-4 weeks delivery.

WALKER MANUFACTURING CO. • 5925 E. HARMONY ROAD • DEPT. LM
FORT COLLINS, COLORADO 80528 • (800) 279-8537 • www.walkermowers.com

Independent, Family Owned Company, Designing and Producing Commercial Riding Mowers since 1980

You can spot a professional by the work they do...



When you see LESCO Commercialplus™ equipment on the job, you know a professional is at work.

LESCO's complete line of equipment is designed and built to meet the demanding requirements of turf-care professionals—no matter what the job. It's rugged and reliable, minimizing maintenance costs and downtime. And it's designed to reduce operator

fatigue, so you get more done in a day's work.

At LESCO, you'll find everything you need no matter what your job requires:

Mowers. Select from our walk-behind rotary mower series with 32" to 54"

fixed cutting decks or our new float-deck hydro models. For the really big jobs, the LCR riding mower series offers four-wheel

drive and up to a 72" deck.

A Zero Turn Rotary Mower is also available with a 52" deck, and three 21" trim mowers round out the selection.

Spreaders and sprayers. LESCO offers the industry's most complete line of rotary, drop and pendulum spreaders. Our 80- and 100-pound rotary spreaders are available in stainless steel or black epoxy



and the tools they use.



and feature a new sealed gear box. To tame any size job, choose from a full range of sprayers, from backpack to fiberglass and poly tank sprayers with up to 300-gallon capacity.

Renovator and aerators.

Renovation work is easy with a renovator that de-thatches, slices and drops seed in one pass. Aerators are designed to maximize core depth in compacted soil conditions and



are available in three walk-behind drum models and one pull unit.

Hand-held power tools.

For the finishing touches, pick from a selection of string trimmers, stick edger, hedge trimmers, chain saws, and backpack and hand-held blowers.

Blowers and truck vacs. LESCO has the right-size equipment for the job to make the final cleanup quick and reliable.

Call 1-800-321-5325 or visit the LESCO



Service Center® nearest you to get the convenience of one-stop shopping for all your LESCO Commercialplus equipment needs.

LESCO Commercialplus. The way professionals get the job done.



LESCO
GROW WITH US™



Mark H. Neidich says a maintenance shop needs "a system".

suffers."

To do this efficiently, says Mark H. Neidich, owner of Fleet Consultants, Cincinnati, each company must develop "a system" for performing tasks such as preventive maintenance and repairs.

Workable system

Many maintenance shops operate under systems that prioritize maintenance tasks and the order of repairs. For instance, work on large equipment may take precedence over smaller equipment. Or, the system may spell out which equipment gets immediate repair, and which must wait.

Many maintenance shops also use computer programs, while others use simple checklists to monitor the status of equipment and parts inventories, and to keep track of maintenance and repair. Some post large bulletin boards where all equip-

ment is listed and its maintenance and/or repair status immediately viewable by anyone in the shop.

Apart from its obvious purpose of keeping production equipment working at job sites, the system must also foster cooperation between the repair shop and operations.

Monitor your system

Any such system must be regularly monitored, emphasizes Neidich. This includes providing proper shop personnel training, the proper tools and parts, and vendor support. A workable system allows a shop to function efficiently. It also allows a company to keep up with its growth.



Multiple locations create new equipment issues, says Ken Railey of Ruppert Landscape.

For example, Ruppert Landscape now has eight locations supporting 13 branches. To meet equipment needs at its eight locations, says

"Our job is to get the equipment out onto the job, working, and making money"--Ken Railey

Railey, it employs two administrative people, 25 repair/maintenance technicians, plus several mobile painters. Shop managers at each Ruppert location regularly report to Railey who joined Ruppert Landscape in 1982 as its first mechanic.

Cagwin and Dorward uses a slightly different system. Its corporate office is in Novato, Calif., with branch offices in San Jose and the East Bay area. It runs 8 satellite operations from these branches.

C&D's Glennon says that each of the three main offices have shop facilities, but the company also maintains a mobile repair capability. His company's shop personnel concentrate on equipment repairs



Everything starts with preventive maintenance, says Ron Turley.

and on manufacturing any speciality equipment the production crews need. An outside contractor visits the branch locations to regularly service the vehicles.

"There has to be somebody responsible at each location, and

there have to be standards," stresses consultant Ron Turley, former fleet manager for huge UPS.

"You have to enforce the standards of your company, and that includes the fact that the equipment is, in fact, important, and that you will take care of it," adds Glennon. □

—RH

Vendors can help out

Build win/win relationships with vehicle and equipment dealers to take some of the pressure off your landscape maintenance/repair shop.

Your loyalty as a customer to a particular dealer or distributor is valuable to that vendor, and many are willing to negotiate once they've established a strong relationship with a client.

The best time to negotiate is when you're hashing out a major equipment purchase. The larger the purchase, the more power you have to negotiate.

Have you considered asking for extended warranties on certain pieces of equipment? Special considerations and/or prices for parts? Better, faster service? The ability to return unused, boxed replacement parts for refunds? But it's almost impossible to build this type of value into a purchase if you're always shopping for the cheapest price.

"The problem with most people when they buy, they go out looking for deals. You should buy like you try to sell; you sell quality," said Ron Kujawa, Kujawa Enterprises, at the ALCA conference in Charlotte this past November.

"You want to buy right, and you don't want to overpay," added Michael Rorie, president of Groundmasters, Inc., Cincinnati. "But paying fair market value is no crime."

There's more than fertilizer in this bag.



There's a total resource. One that can help you grow healthy, green turf with a strong root system and a solid base. Turf that's healthy and better able to fight disease, pests and everyday wear and tear. That resource is Terra. You'll find a complete line of Terra Professional Fertilizers – including slow-release sources with primary, secondary, micronutrient and pesticide packages available. Plus, you can count on the support, service, assistance and expertise it takes to select and use

the right fertilizer. The product that will do the job for you. For fertilizers, turf seed, plant protection products and a whole lot more – work with Terra. You'll get more.



Terra Industries Inc.
P.O. Box 6000
Sioux City, Iowa 51102-6000
1-800-288-7353
www.terraindustries.com

Working with you.





NOVARTIS

Finally, the critical to give the lawn the support you've

Novartis, created by the merger of Ciba and Sandoz, is committed to bringing new skills, new technologies, and new services to the lawn & landscape and tree & shrub care industries.

Our people include 25 dedicated field sales representatives and 8 experienced R&D representatives nationwide.

Our broad line of products are leading-edge, environmentally sound, low-rate formulations like Barricade® and Banner® MAXX®. Plus, many new products on the way.



Pre-Stress Conditioning
Plant Growth Regulation
Overseeding



Crabgrass
Goosegrass



Yellow Nutsedge



Powdery Mildew
Leafspot
Rust

mass necessary care industry been waiting for.

Even more importantly, look for Novartis to go beyond great products to bring you the technical information and leading-edge research you can use to grow your business. This is the basis of the Novartis Lawn & Landscape Partners Program.

Novartis also supports the long term goals of the GIE, and are proud sponsors of educational and supporting events at PLCAA, ALCA and PGMS.

To learn more about Novartis and the Lawn & Landscape Partners Program, call 1-800-395-TURF.



Dutch Elm
Oak Wilt



Spider Mites
Leafminers



Fire Ant Control

The Novartis
Lawn & Landscape
Partners Program.

The Products and
Support You
Need To Grow
Your Business.



BAITS VS. FIRE ANTS

tried in Texas

Fire ant control strategy combines homeowner education with bait products. The goal is to cut irresponsible use of other control products.

Fire ants in Texas are the target of a new community-based education and treatment program that

centers on broadcast applications of insecticide rather than individual mound treatments with products such as diazinon.

Entomologists and other pest control specialists say the approach is the most cost-effective method to control these stinging marauders.

It also represents an opportunity for lawn care operators to contract with neighborhood associations, garden clubs, athletic organizations and city councils for application services.

In an effort to promote fire ant control by using products that won't harm waste water, the "Let 'em Eat Bait" program was started by the Fort Worth water department, to reduce the amount of diazinon showing up in waste water. (See LM, Jan. 1997).

Cities such as Fort Worth have been able to duck heavy EPA fines as long as



Keep off the grass! Fire ant mounds shown here are an example of what Texas homeowners have to contend with.

they can demonstrate a sincere effort at reducing the pollution.

The program recommends that residents of entire neighborhoods select a dry day in the fall and one day in spring to make broadcast applications of fire ant baits in unison across entire neighborhoods and open spaces.

(The use of slow-acting baits allows the worker ants to carry the product back to the nest and feed it to the queen. Once the queen dies, the colony perishes.)

Less expense, less effort

"Baits provide for control with less expense and effort than contact products," says Mike Merchant, Ph.D., urban ento-

Fire ants a medical, and an economic menace

Fire ants, probably from Brazil, entered the United States through the Port of Mobile, AL, in the 1930s.

They've since spread across the Southeast where they have no natural enemies.

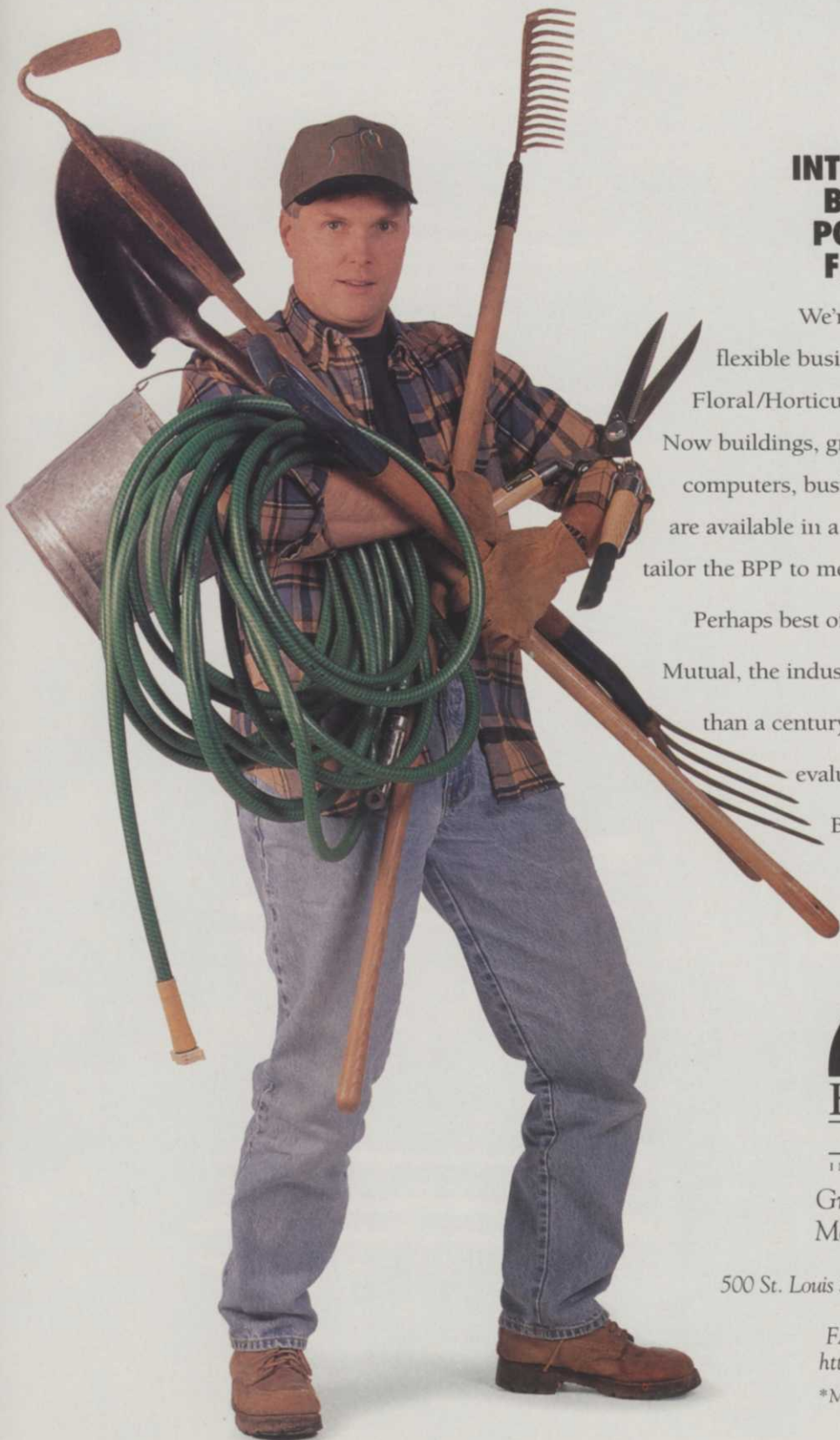
In Texas alone it's estimated that \$300 million each year is spent trying to control them; in medical expenses; in livestock losses and equipment repair. They damage electrical systems by invading power transform-

ers and chewing through wiring. They burrow into roadways and their mounds damage farm equipment.

One of the biggest environmental problems is caused by consumers who use excess amounts of diazinon and other products as they try to eradicate the ants.

The City of Ft. Worth represents a prime example of complications that may arise from the misuse of contact insecticides in fire ant control programs. Traces of these products (when misapplied) run off into sewer systems, and can result in a failing grade from the Environmental Protection Agency.

INSURANCE IS ONE THING YOU SHOULDN'T HAVE TO WRESTLE WITH.



INTRODUCING THE NEW BUSINESS PACKAGE POLICY (BPP)* FROM FLORISTS' MUTUAL.

We're proud to present the most flexible business package policy the Floral/Horticultural industry has ever seen. Now buildings, greenhouses, contents, crops, computers, business income and public liability are available in a single policy. We can custom-tailor the BPP to meet your unique needs.

Perhaps best of all, you'll be covered by Florists' Mutual, the industry's insurance specialist for more than a century. Call us today for a free coverage evaluation and custom-tailored Business Package Policy proposal.



*Growing With You For
More Than A Century*

500 St. Louis Street, Edwardsville, IL 62025-1573
1-800-851-7740
FAX 1-800-233-FMIC
<http://www.plantnet.com>

*May not be available in all states.



THE OBJECT OF THE GAME


IS TO GAIN MORE YARDS

THAN YOU LOSE.

SOUND FAMILIAR?

No, you may not have a three hundred pound nose guard breathing down your neck, but the lawn care business does have something just as imposing. The callback. And when you get hit by it too often, you can lose just as many yards. But one application of MERIT[®] Insecticide is all it takes to control grubs and callbacks. And fewer callbacks mean more time, money and labor you can use to gain more yards. For more information, contact Bayer Corporation, Garden & Professional Care, Box 4913, Kansas City, MO 64120. (800) 842-8020.

<http://usagri.bayer.com>

Bayer 



ALWAYS READ AND FOLLOW LABEL DIRECTIONS

© 1998 Bayer Corporation Printed in U.S.A. 98S19A0141

Circle No. 107 on Reader Inquiry Card

mologist with the Texas Agricultural Extension Service.

"Broadcast applications of baits are easier and less expensive to use and are more effective overall, since they treat mounds both above and below the ground."

The county is hiring four new county agents. A total of eight county agents will specialize in fire ant control, in Dallas/Fort Worth; Houston; San Antonio; Austin.

"The county agents will be the ones who are going to try to set up the neighborhood programs. Hopefully, come spring, we'll be getting out and visiting with neighborhoods to round up support for the program," says Merchant.

"The idea is to let the homeowner groups decide which product they're going to use. We've got Amdro; Raid; Logic; Combat. The neighborhoods will probably choose depending on what's available and cost.

"We're not mandating any particular bait; we may offer some observations on the different types of baits."

"Logic seems to be the most effective, long term controller; it does have the drawback that it's real slow, and for treating smaller areas that's a big drawback. By the time you get fire ants controlled in a small yard you may have infestation from other areas. I've recommended Logic for people treating larger areas. But for small urban back yard, you probably want to go with a faster acting product like Amdro, or Raid or Combat.

"All of these products are sold over-the-counter. Amdro is sold to professionals as Logic; Amdro is sold as Amdro. The Raid product is sold to pest control operators as Ascend; the Combat product is sold to professionals as Max Force.

Merchant says Griffin Corp. might release a new product in spring for pest control operators.

Research sampling

"The number of products is increasing, so we're not just sticking with Amdro and Logic," says Merchant.



Mounted broadcast spreaders cut worker exposure to pest, cover ground faster.

Comparisons of new mound occurrence prior to and after treatment with baits and contact products were conducted recently at Clemson University. Results showed that areas receiving a broadcast application of Amdro bait had only two new mounds over the course of the eight weeks of study, and brought more than 96 percent control.

Untreated areas and areas subjected to mound applications of baits developed 11 to 12 new mounds.

"This is not abnormal considering that mounds developing underground are not treated and 'pop up' later," says Dr. Mac Horton, professor and chair of Clemson's Department of Entomology.

Plots on which mounds were treated individually had 22 to 28 new mounds.

"Ants that are not in the mound at the time of application are not exposed [to the insecticide] and, therefore, not controlled," explains Horton. "Our observations are that these individual ants may not even enter a treated mound, and must relocate to a new domain." **LM**

How to sell the service

Lawn care operators who want to increase their fire ant control business need to take the benefits of large-scale broadcast bait applications to influential community leaders and organizations.

These include homeowners associations, retirement community managers, garden clubs, civic groups and local government.

The LCO's goal: generate attention on fire ants and the advantages of broadcast bait applications applied by professionals.

▶ Consider a "fire ant information group." A spokesman for the organization—one who is viewed as a fire ant control expert—would address various civic and homeowner groups about fire ants, the problems encountered in controlling them and why broadcast bait applications work.

▶ A "Fire Ant Day" could be coordinated and include educational visits by the expert to schools and other groups. Expand the format to include walks through open areas, schoolyards and playgrounds to identify and treat problem areas.

▶ A key message is that contracting with a professional LCO ensures proper application of the bait throughout the community; and that professional application frees neighborhoods of the responsibility for coordinating the community-wide effort.

▶ Other publicity angles are possible as a result of this approach: TV, radio, newspapers, all can bring your company some potentially valuable exposure.

Getting lots of really good new customers is a pain in the you-know-what, but...

Even The World's Greatest, Most Reliable, Most Attentive To Detail, Hardest Working Gardener, Lawn & Garden Service Owner or Landscape Contractor Will Starve To Death—Without A Steady Flow Of New Customers!

"I started with a lawn mower and built a million-dollar-plus, highly profitable, and highly respected landscape contracting business at a rapid pace—because of my Customer Attraction Secrets...now, my Free Report reveals my secrets, to those who qualify."

Dayton, Ohio- Are you frustrated by advertising that never makes the phone ring? By being beat out of good jobs by cheap bidders? Feeling like you're starting your business all over again every season? Stuck at a certain level?

A million dollar per year "entrepreneur of the year" says that most of his peers' and competitors' marketing is anemic, me-too-istic, dull, full of costly waste, and ineffective. Arrogant? Egotistical? Marty Grunder says: "React to me any way you like—but one thing is for sure, if you are in the landscaping business or maintenance business, whether you are small or large, my marketing methods can easily double or triple your business in just one year, provide better customers, help you target and get exactly the kind of business you want, increase profitability and stability, and absolutely mystify and trump your competitors."

Big talk? Yes, it is, but this Grunder wisecracker has been showing off—and blowing sceptics away—his entire life. As a freckle-faced, red headed Dennis-the-Menace type kid, he started his business with nothing more than a "push" lawn mower and chutzpah. That little business went to 75 regular customers almost overnight. As a full-time student at the University of Dayton, while his buddies drove to school in old "beater" cars and flipped burgers for pocket money, Marty arrived in his Grunder Landscaping Company truck and, at age 21, did over \$300,000.00 in business. Last year he was named Young Entrepreneur of the Year by the Small Business Administration's Midwest Region, in the 1 to 25 employees category. Currently, Marty oversees a staff of 30, 18 trucks, a backhoe, an assortment of other equipment, and a diversified business doing everything from basic residential lawn maintenance to complicated commercial landscaping projects—and, this year, breaking \$1.5 million in annual sales. He's also investing in land, lecturing from time to time, and working with other landscapers as their "marketing coach."

Million Dollar Marketing Secrets Revealed In A Free Report—If You Qualify!

Grunder DOES have "secrets" for building these types of businesses, too. Here are just a few examples:

1. How to **spark referrals**... how to turn "small accounts" into big business.
2. How to **increase Val-Pak Coupon, direct-mail and Yellow Pages advertising results by 10% to 30%**...make your advertising much more productive and be able to accurately measure its value.

3. The 5 biggest mistakes 95% of the people in this business make when advertising and how to avoid them.
4. **How to stop the "price shopper" in his tracks. How to get good business without being the lowest bidder or offering cheapest price.**



Here's the smart-aleck kid standing next to his first truck. Who'd have guessed he'd quickly create the biggest and best company in southern Ohio, confound established, entrenched competitors, and exceed \$1.5 million in annual sales? Betcha he has a marketing secret or two in his pocket that you'd love to steal, if you could!

5. How to avoid the **fatal mistake** of confusing "marketing" with "selling".
6. **Forget wasteful "name recognition" or "getting your name out there"**—learn to "target," create and deliver a "market-matched" message, and **attract exactly the type and size of clients you really want.**
7. Why your "service" should never be the #1 focus of your marketing.
8. Powerful but simple letters and things to say to existent customers to **cause demand for a variety of additional, highly profitable services.**
9. **The "secret" borrowed from the fad-diet business that sells high-priced, high-profit landscaping work like crazy.**
10. How to get people working for you and with you to really contribute like a championship team!
11. How to use "**automated, autopilot marketing**" to bring in new business without you or anyone else even talking with prospects on the phone!
12. Even "**poor boy**" **dirt cheap marketing** strategies, like what to write on a simple postcard to bring in a flood of new customers.

13. The "**4-Page**" marketing tool used **6 to 10x a year that is guaranteed to increase your business by at least 30% year after year...automatically!**
14. How to position yourself as a "famous expert" in your area, get a ton of free advertising and "**fry**" the competition.

And there's a whole lot more. At the urging of a big-time, nationally respected direct marketing consultant and professional speaker who discovered and was "blown away" by everything Marty was doing, Marty prepared an easy-to-read but very complete, provocative Special Report—"How To Re-Invent Your Lawn-Garden/Landscaping Business With Million Dollar Marketing Secrets"—and you may be able to obtain a copy at absolutely no cost whatsoever.

Who Should Get Marty Grunder's Special Report?

Marty asks that you call for his free Report **ONLY** if: (1) you own your own business or are the President, CEO, manager or marketing manager for the business; (2) you make the decisions about advertising, marketing, and customer service investments; (3) you are currently unhappy with some aspect(s) of your business; (4) you recognize that in today's competitive environment, just "doing a great job" isn't enough to sustain a business; and (5) you are willing to make progressive innovative changes in your business if convinced, even reasonably assured that doing so will dramatically improve sales, profits, customer satisfaction, referrals, growth, and community prominence. (Please do NOT waste your time or Marty's money getting this Special Report if you are close-minded, change resistance, fully satisfied with your income, or just a curiosity-seeker without sincere interest in changing your business for the better.)

How To Get Your Free Report:

Simply write "Report" on your business card or a sheet of your letterhead and FAX it to 937-847-8067 or, for even more information and to get your Report, call 1-800-399-7135, listen to a brief free recorded message, then leave your name, company name, and address as instructed. You can FAX or call anytime, 24 hours a day, 7 days a week. If you prefer having your report sent confidentially to your home address, just let us know. Incidentally, requesting your free Report does not obligate you in any way; no salesperson will call to follow-up, nothing of the sort. However, this is a limited free offer, so please take care of it right now, while it's fresh in your mind.

©1995 M. Grunder

Duncan leads OTF in '98

Joe Duncan, president of Ever-Green Turf and Landscape of Troy, Ohio, is the new president of the Ohio Turfgrass Foundation.

David Webner, Lake Forest CC is president-elect; Randy Tischer of Green Velvet Sod Farms was named OTF vice president.

Lin Dunaway of Walnut Grove CC is OTF treasurer for the new year.

ALCA promotes industry to managers

The Associated Landscape Contractors of America attended Workplace '97 in October, to explain to facility managers the environmental and economic benefits of plants in the workplace. ALCA brought together more than 35 ALCA member companies and suppliers in support of the theme "Hire a Professional Landscape Contractor."

"Our displays and participation vividly demonstrated how plants reshape the work environment and why facility managers should hire a professional landscape contractor," says Judy Guido, chair of the ALCA Public Relations Committee.

"Mommy, where does grass come from?"

"Advanta Seeds Pacific, of course!"



Albany, Oregon 97321-0452 U.S.A.
1-800-288-7333 or 1-541-967-8923 in Oregon

Seven earn CLP title

The following ALCA members recently passed the Certified Landscape Professional (CLP) exam:

Lorne Hall, CLP, Western Lawns, Inc., Bethany, OK

Thomas Moore, CLP, Environmental Care, Inc., San Jose, CA

Shannon Parsley, CLP, Executive Landscape, Pensacola, FL

Ronald Schmoyer, CLP, ISS Landscape Management Services, Tampa, FL

Robert Schucker, CLP, R & S Landscaping, Midland Park, NJ

David Snodgrass, CLP, Dennis' Seven Dees Landscaping, Portland, OR

Thomas Whidden, CLP, Community Landscape Services, Chantilly, VA

For general information on ALCA's certification programs, contact Kimberly Pratt, Certification Manager, at 800-395-2522.

Receive FREE information on products and services advertised in this issue.

LANDSCAPE
management

February 1998

This card is void after April 15, 1998

NAME (please print) _____
 TITLE _____
 FIRM _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP _____
 PHONE (____) _____ FAX (____) _____
 INTERNET/E-MAIL ADDRESS _____

I would like to receive (continue receiving) LANDSCAPE MANAGEMENT free each month: Yes No

Signature: _____ Date: _____

Fill in ovals as shown: ●

1. My primary business at this location is: (fill in ONE only)

- 01 250 GOLF COURSES (Also fill in questions #3 & #4)
- 02 255 Landscape Contractors (Installation and maintenance)
- 03 260 Lawn Care Service Companies
- 04 265 Custom Chemical Applicators (ground and air)

- 05 270 Tree Service Companies/Arborists
- 06 275 Landscape Architects
- 07 280 Land Reclamation and Erosion Control
- 08 285 Irrigation Contractors
- Other (please specify) _____

- 09 290 Sports Complexes
- 10 295 Parks
- 11 300 Right-of-Way Maintenance for Highways, Railroads or Utilities
- 12 305 Schools, Colleges, Universities
- 13 310 Industrial or Office Parks/Plants
- 14 315 Shopping Centers, Plazas or Malls
- 15 320 Private/Public Estates or Museums
- 16 325 Condos/Apartments/Housing Developments/Hotels/Resorts
- 17 330 Cemeteries/Memorial Gardens
- 18 335 Hospitals/Health Care Institutions
- 19 340 Military Installations or Prisons
- 20 345 Airports
- 21 350 Multiple Government Municipal Facilities
- Other (please specify) _____

- 22 355 Extension Agents/Consultants for Horticulture
- 23 360 Sod Growers/Turf Seed Growers/Nurseries
- 24 365 Dealers/Distributors/Formulators/Brokers
- 25 370 Manufacturers
- Other (please specify) _____

2. Which of the following best describes your title? (fill in ONE only)

- 26 10 Executive/Administrator- President, Owner, Partner, Director, General Manager, Chairman of the Board, Purchasing Agent, Director of Physical Plant
- 27 20 Manager/Superintendent- Arborist, Architect, Landscape/Grounds Manager, Superintendent, Foreman, Supervisor
- 28 30 Government Official- Government Commissioner, Agent, Other Government Official
- 29 40 Specialist- Forester, Consultant, Agronomist, Pilot, Instructor, Researcher, Horticulturist, Certified Specialist
- 30 50 Other Titled and Non-Titled Personnel (please specify) _____

3. Is your golf course:

- 31 A Public 32 B Semi Private 33 C Private 34 D Hotel/Resort 35 E Municipal

4. If you work for a golf course, how many holes are on your grounds?

- 36 1 9 37 2 18 38 3 27 39 4 36+

5. How many acres are maintained at your facility? _____

6. SERVICES PERFORMED (fill in ALL that apply)

- 40 A Mowing 45 F Turf Fertilization 50 K Paving, Deck & Patio Installation
- 41 B Turf Insect Control 46 G Turf Disease Control 51 L Pond/Lake Care
- 42 C Tree Care 47 H Ornamental Care 52 M Landscape Installation
- 43 D Turf Aeration 48 I Landscape/Golf Design 53 N Snow Removal
- 44 E Irrigation Services 49 J Turf Weed Control 54 O Other (please specify) _____

7a. Do you specify, purchase or influence the selection of landscape products?

- Yes No

7b. If yes, check which products you buy or specify: (fill in ALL that apply)

- 55 1 Aerators 62 8 Herbicides 69 15 Sweepers
- 56 2 Blowers 63 9 Insecticides 70 16 Tractors
- 57 3 Chain Saws 64 10 Line Trimmers 71 17 Truck Trailers/Attachments
- 58 4 Chipper-Shredders 65 11 Mowers (reel/rotary) 72 18 Trucks
- 59 5 De-icers 66 12 Snow Removal Equipment 73 19 Turfseed
- 60 6 Fertilizers 67 13 Sprayers 74 20 Utility Vehicles
- 61 7 Fungicides 68 14 Spreaders

8. Do you have a modem? Yes No

101	113	125	137	149	161	173	185	197	209	221	233	245	257	269	281	293	305
102	114	126	138	150	162	174	186	198	210	222	234	246	258	270	282	294	306
103	115	127	139	151	163	175	187	199	211	223	235	247	259	271	283	295	307
104	116	128	140	152	164	176	188	200	212	224	236	248	260	272	284	296	308
105	117	129	141	153	165	177	189	201	213	225	237	249	261	273	285	297	309
106	118	130	142	154	166	178	190	202	214	226	238	250	262	274	286	298	310
107	119	131	143	155	167	179	191	203	215	227	239	251	263	275	287	299	311
108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	312
109	121	133	145	157	169	181	193	205	217	229	241	253	265	277	289	301	313
110	122	134	146	158	170	182	194	206	218	230	242	254	266	278	290	302	314
111	123	135	147	159	171	183	195	207	219	231	243	255	267	279	291	303	315
112	124	136	148	160	172	184	196	208	220	232	244	256	268	280	292	304	316



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO 950 PITTSFIELD MA

POSTAGE WILL BE PAID BY ADDRESSEE

LANDSCAPE
management

ADVANSTAR COMMUNICATIONS INC
PO BOX 5054
PITTSFIELD MA 01203-9697





NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO 950 PITTSFIELD MA

POSTAGE WILL BE PAID BY ADDRESSEE



ADVANSTAR COMMUNICATIONS INC
PO BOX 5054
PITTSFIELD MA 01203-9697



February 1998
This card is void after April 15, 1998

NAME (please print) _____
 TITLE _____
 FIRM _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP _____
 PHONE (____) _____ FAX (____) _____
 INTERNET/E-MAIL ADDRESS _____

I would like to receive (continue receiving) LANDSCAPE MANAGEMENT free each month: Yes no

Signature: _____ Date: _____

- Fill in ovals as shown: ●
- 1. My primary business at this location is: (fill in ONE only)**
- 01 250 GOLF COURSES (Also fill in questions #3 & #4)
 - 02 255 Landscape Contractors (installation and maintenance)
 - 03 260 Lawn Care Service Companies
 - 04 265 Custom Chemical Applicators (ground and air)
 - 05 270 Tree Service Companies/Arborists
 - 06 275 Landscape Architects
 - 07 280 Land Reclamation and Erosion Control
 - 08 285 Irrigation Contractors
 - Other (please specify) _____
 - 09 290 Sports Complexes
 - 10 295 Parks
 - 11 300 Right-of-Way Maintenance for Highways, Railroads or Utilities
 - 12 305 Schools, Colleges, Universities
 - 13 310 Industrial or Office Parks/Plants
 - 14 315 Shopping Centers, Plazas or Malls
 - 15 320 Private/Public Estates or Museums
 - 16 325 Condos/Apartments/Housing Developments/Hotels/Resorts
 - 17 330 Cemeteries/Memorial Gardens
 - 18 335 Hospitals/Health Care Institutions
 - 19 340 Military Installations or Prisons
 - 20 345 Airports
 - 21 350 Multiple Government Municipal Facilities
 - Other (please specify) _____
 - 22 355 Extension Agents/Consultants for Horticulture
 - 23 360 Sod Growers/Turf Seed Growers/Nurseries
 - 24 365 Dealers/Distributors/Formulators/Brokers
 - 25 370 Manufacturers
 - Other (please specify) _____

- 2. Which of the following best describes your title? (fill in ONE only)**
- 26 10 Executive/Administrator- President, Owner, Partner, Director, General Manager, Chairman of the Board, Purchasing Agent, Director of Physical Plant
 - 27 20 Manager/Superintendent- Arborist, Architect, Landscape/Grounds Manager, Superintendent, Foreman, Supervisor
 - 28 30 Government Official- Government Commissioner, Agent, Other Government Official
 - 29 40 Specialist- Forester, Consultant, Agronomist, Pilot, Instructor, Researcher, Horticulturist, Certified Specialist
 - 30 50 Other Titled and Non-Titled Personnel (please specify) _____

3. Is your golf course:
 31 A Public 32 B Semi Private 33 C Private 34 D Hotel/Resort 35 E Municipal

4. If you work for a golf course, how many holes are on your grounds?
 36 1 9 37 2 18 38 3 27 39 4 36+

5. How many acres are maintained at your facility? _____

6. SERVICES PERFORMED (fill in ALL that apply)

- 40 A Mowing 45 F Turf Fertilization 50 K Paving, Deck & Patio Installation
- 41 B Turf Insect Control 46 G Turf Disease Control 51 L Pond/Lake Care
- 42 C Tree Care 47 H Ornamental Care 52 M Landscape Installation
- 43 D Turf Aeration 48 I Landscape/Golf Design 53 N Snow Removal
- 44 E Irrigation Services 49 J Turf Weed Control 54 O Other (please specify) _____

7a. Do you specify, purchase or influence the selection of landscape products?
 Yes No

7b. If yes, check which products you buy or specify: (fill in ALL that apply)

- 55 1 Aerators 62 8 Herbicides 69 15 Sweepers
- 56 2 Blowers 63 9 Insecticides 70 16 Tractors
- 57 3 Chain Saws 64 10 Line Trimmers 71 17 Truck Trailers/Attachments
- 58 4 Chipper-Shredders 65 11 Mowers (reel/rotary) 72 18 Trucks
- 59 5 De-icers 66 12 Snow Removal Equipment 73 19 Turfseed
- 60 6 Fertilizers 67 13 Sprayers 74 20 Utility Vehicles
- 61 7 Fungicides 68 14 Spreaders

8. Do you have a modem? Yes No

101	113	125	137	149	161	173	185	197	209	221	233	245	257	269	281	293	305
102	114	126	138	150	162	174	186	198	210	222	234	246	258	270	282	294	306
103	115	127	139	151	163	175	187	199	211	223	235	247	259	271	283	295	307
104	116	128	140	152	164	176	188	200	212	224	236	248	260	272	284	296	308
105	117	129	141	153	165	177	189	201	213	225	237	249	261	273	285	297	309
106	118	130	142	154	166	178	190	202	214	226	238	250	262	274	286	298	310
107	119	131	143	155	167	179	191	203	215	227	239	251	263	275	287	299	311
108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	312
109	121	133	145	157	169	181	193	205	217	229	241	253	265	277	289	301	313
110	122	134	146	158	170	182	194	206	218	230	242	254	266	278	290	302	314
111	123	135	147	159	171	183	195	207	219	231	243	255	267	279	291	303	315
112	124	136	148	160	172	184	196	208	220	232	244	256	268	280	292	304	316

Events

FEBRUARY

10-15: National Arborist Assoc. Winter Management Conference, Hotel Intercontinental, New Orleans, La.; Carol Crossland, 800/733-2622; 603/672-2613.

11-13: Turfgrass Producers International Midwinter Conference & Exposition, Westin Maui at Kaanapali Beach, Maui, Hawaii; 800/627-13156 for travel accommodations.

14-18: ALCA Executive Forum, Renaissance Vinoy, St. Petersburg, Fla.; 800/395-2522.

16-20: Long Island Turfgrass Management Short Course, Long Island, NY; 607/255-1792.

16-20: Virginia Tech Turfgrass Ecology and Management short course, Donaldson Brown Hotel and Conference Center, Blacksburg, Va.; 540/231-5128.

16-20: International Erosion Control Association Conference & Trade Expo, Reno, Nev.; 800/455-4322.

17-19: Landscape Contractors Assn. Winter Workshop, Univ. of Md. Shady Grove Conference Center; Kathleen Feehan, 301/948-0810; 301/990-9771

17-19: Landscape Contractors of MD/DCVA, Winter Workshop, University of Maryland System Shady Grove Center, Rockville, Md.; 301/948-0810.

18: Connecticut Turf & Landscape Conference, for the Connecticut Grounds Keepers Assoc.; Hartford Civic Center, Hartford, Ct.; fax: 230/699-9912; e-mail: cgka@snet.net.

18-21: Outdoor Power Equipment Distributors Association (OPEDA) annual meeting, Buena

Vista Palace, Orlando, Fla.; Julie Burns, 215/564-3484; 215/564-2175

19-20: Northern California Turf & Landscape Council show, Santa Clara Convention Center, Santa Clara, Calif.; 510/505-9600.

23-24: Turf & Grounds Exposition II, Holiday Inn, Suffern, NY; 518/783-1229.

23-27: Illinois Turfgrass Foundation,

Ind./Ill. Turfgrass Short Course, Holiday Inn, Willowbrook, Ill.; Tom Voigt, 217/333-7847; 217/244-3469.

24-26: Athletic Field Construction & Maintenance, Rutgers' Cook College Office of Continuing Professional Education; 732/932-9271.

25: NJ Landscape '98, Harmon Meadow, Secaucus, NJ; Mark Graser, 201/664-6310. **LM**

Renovation? Put the old on hold and let the new grow through!

Put existing
cool-season turf
on hold to
speed up
establishment
of new species.



Call for your **FREE** copy of
"The Professional's Guide to Turf and Ornamental
Plant Growth Regulation" 1-800-821-7925.

Now labeled for growth regulation
of over 23 ornamental species.

EMBARK®

Turf and Ornamental Growth Regulator

ALWAYS READ AND FOLLOW
LABEL DIRECTIONS.

G pbi/gordon
CORPORATION
An Employee-Owned Company

www.pbigordon.com

©1998, PBI/Gordon Corporation. Embark® is a registered trademark of PBI/Gordon Corporation. 030/298

SUPPLIERS CORNER

AgEvo now supports GOLFWORKS, a program created by the Metropolitan Golf Association Foundation, which provides summer employment in country clubs for poor and minority high school students. GOLFWORKS has placed more than 100 students in jobs since 1993.

Zeneca Professional Products has named Jerid T. Wendling as Territory Sales Representative for the western Florida. Wendling handles sales and distribution of turf and ornamental products. Formerly with Ciba Crop Protection, Wendling holds a degree in plant and soil science.

Rain Bird Sales now has

Mitch Wood as a district manager for the southeast US. Wood works with company distributors in the region to increase sales and market share. Visit the Rain Bird web site at www.rainbird.com, for information on various topics such as: product specifications (with detailed drawings); common questions; technical support; product training schedules; irrigation design software (which can be downloaded from the site and links to other irrigation-related sites).

TRIMS Software International, Inc. has been awarded a contract to develop an Equipment Maintenance System for **Jacobsen Division of Textron, Inc.** The system will

be installed at Jacobsen branch and distributor locations. The software provides preventive maintenance schedules, maintenance records, spare parts inventory, on-line illustrated parts catalog and electronic parts order processing for maintenance technicians.

Century Rain Aid has purchased Gulf Coast Pump, a wholesale distributor of irrigation and well drilling supplies, with four locations in Alabama and Florida. Century is the a leading distributor of landscape irrigation equipment. The company now has 68 locations in the US and Canada, and plans to expand its product line and training programs for drilling contractors, says

Mike Stein, vice president of Century's Southeast region.

Lofts Seed reports that its Triplex ryegrass blend will be used at Ericsson Stadium, home of the NFL's Carolina Panthers. In December, the Lofts company presented a check for \$822,522 to Rutgers University, for turf royalties.

Fairmount Minerals has agreed to purchase the **Garrick Corporation**, Cleveland-based supplier of bulk materials to the landscape, golf and nursery industries. Gary Trinetti will continue as general manager and vp of Garrick. Chuck Fowler is president and CEO of Fairmount.

Helen Lucas is vice president of **Seed Research of Oregon, Inc.** Lucas manages the company's warm-season turfgrass program, professional marketing in the Southwest and foreign marketing and sales efforts. There is a new address for SRO: 27630 Llewellyn Rd., Corvallis, Ore. 97333.

James R. Collins is the new specialty products director for **FMC Corporation**.

At **Jacklin Seed Co.**, the following promotions have been announced: Hiromi Yanagisawa is senior vp of marketing; Tom Stoesser is senior vp of finance, administration and acquisitions; Myron Lightbody is senior vp of plant operation; Glenn Jacklin is now senior vp production and grower services; Dr. Doug Brede is senior vp of research. **LM**

Info center

VIDEOS AND LITERATURE FOR THE GREEN INDUSTRY

MANAGEMENT SOFTWARE FROM CHARLES... Vander Kooi & Associates, Inc. sells landscape estimating and accounting software. VKA Estimating Software removes the guesswork in bidding and recovers the correct amount of overhead for the job; completes bids faster and more accurately and generates cost summary reports. "Mr. Accountant" software includes the general ledger, accounts payable, accounts receivable, disbursements and payroll modules. Costs are \$4900 for accounting programs; Estimating software starts at \$795. Demos available. Contact Vander Kooi & Associates, Inc., at 1495 Harbortgate Blvd., Mt. Pleasant, SC 29464-4212; 888/971-1724.

BROCHURE FOR LEAF PICK-UP HOSES... The Flexaust Company has introduced a new four-color product brochure for lightweight flexible hose and ducting. The 12-page publication makes it easy to identify the right product for a myriad of industrial applications. Free of charge; contact The Flexaust Company, Inc., P.O. Box 4275 Warsaw, IN 46581-4275; 1-800-DUCTING; www.flexaust.com

COMPANY GUIDE TO LIGHTING PRODUCTS...

Columbia Lighting and Prescolite • Moldcast Lighting of Spokane, WA, have issued the first edition of the *Product Selection Guide*. The 402-page, full-color guide provides comprehensive product data for all Columbia and Prescolite • Moldcast product lines. A wide array of full-color application photos depict Columbia and Prescolite • Moldcast fixtures in a range of environments. Copies are free to professional lighting specifiers. Fax requests to: 509-921-7539.

Practical turfgrass management information you can depend on.

Your subscription to **TURFGRASS TRENDS** gives you the information you need to manage the toughest turfgrass problems. Written by experts in the field, timely information and latest leading-edge research give you practical, proven answers to the challenges you face.

- disease management
- genetic improvement
- nutrients
- irrigation
- insect management
- weed management

TURFGRASS TRENDS is the hands-on tool you've been looking for to keep up to date on the latest cutting edge research and proven turf management practices. Find out why others are calling **TURFGRASS TRENDS** "the #1 research digest for turf managers." Begin your subscription today!

"**TURFGRASS TRENDS** is an important planning resource. The advanced seasonal information is timely for preparing my stress-avoidance programs."


*Mark H. Bunte
Golf Course Superintendent
Lake Wildwood Country Club
Penn Valley, CA*

"... helpful and informative. I believe this is a very valuable publication, especially as we all work to protect the environment."

*Dr. Terrance P. Riordan
Turfgrass Plant Breeder
University of Nebraska*

"**TURFGRASS TRENDS** is geared toward conveying information, not advertising... I consider it to be the best publication in my field."

*Barry Carter
Golf Course Superintendent
Oak Hills Country Club
San Antonio, TX*

Yes! Begin my subscription to **TurfGrass TRENDS** 

U.S. & CANADA..... 6 Months \$96 1 Year \$180
ALL OTHER COUNTRIES..... \$210 (1 Year)

Payable in U.S. funds drawn on a U.S. bank.
Back issues available at \$15 each, prepaid.


AN ADVANSTAR PUBLICATION

- My payment enclosed. (Make checks payable to **TURFGRASS TRENDS**.)
 Charge my subscription to: VISA MasterCard American Express



Signature _____ Date _____

Account # _____ Exp. Date _____

Billing Address _____

City _____ State _____ Zip/Postal Code _____

Fax completed form with credit card information to 218-723-9437, or mail coupon with your payment to **TURFGRASS TRENDS**, 131 West First Street, Duluth, MN 55802-2065.

Name (please print) _____

Title _____

Business _____

Address _____

City _____ State _____ Zip/Postal Code _____

Country _____

Internet/E-Mail Address _____



Toro's Z Master fast, rugged

Sporting a sleek, compact design, the new line of Z Master Outfront ZRTs are rugged, hill-hugging mowers. The Z325 and Z320 are equipped with huge 23-inch tires (the largest for competitive OFZ riders), a wide wheelbase and low center of gravity and weight directly over the rear wheel, which provides superior stability and exceptional traction on undulating turf.

The Z Master OFZ also features hydrostatic drive, and a choice of either a 20-hp (Z320) or 25-hp (Z325) Kohler Command vertical-shaft engine. With a forward ground speed of over 8 miles per hour and a reverse speed of 4 miles per hour, the Outfront Z riders are the fastest on the market.

The Outfront Z riders are available with 60-inch side-discharge deck or a 48-inch Recycler/rear bagger deck, a first in the industry. The deck converts within minutes with basic hand tools.

Circle No. 263

Swisher ZTR is sleeker

Swisher continues to improve its Zero-Turning Radius Ride King Mower with a new easy, height adjustment system, wider wheels for better traction and ride, new seat for more operator comfort, and a new aerodynamic look.

Available with 8-hp Briggs & Stratton or 6-hp Tecumseh. Optional convertible mulching capability. Optional built-in sweeper bagger available. Contact Swisher Mower & Machine Co. at 800/222-8181, or

Circle No. 264



New decks for Hustlers

Excel Industries introduces two new competitively priced side-discharge decks. With a choice of 60 and 72-inch models, the new decks are available for the 3000 and 4000-Series Front Mount tractors as well as the 2500 Mid-Mounts.

These new side-discharge decks can be easily converted to mulching decks and can also be adapted to the Hustler BAC-VAC collection system. Another important feature available on the front-mount versions is the tilt-up design which allows for easy blade servicing.

For more information, contact Excel Industries at 800/395-4757, or

Circle No. 265



Commercial Clipper is tough cutter with lots of torque

The new zero-turning-radius Commercial Clipper from Country Clipper has a 25-hp Kohler V-Twin OHV Command engine and 23-inch drive wheels. The Kohler engine provides more torque and high fuel economy along with a reduction in noise and vibration.

Other improvements include a 10-gauge steel-reinforced deck. Both the 48-inch and 60-inch decks have steel plate reinforcement at the trim edge, spindle attachment area, front deck lip and skid lift discharge chute.

Contact Country Clipper at 800/344-8237, or

Circle No. 266

Articulator stable in severe terrain

LasTec's Model 325E Articulator features three individual 25-inch cutting decks combined for a total cut path of six feet. LasTec combines its floating rotary mower deck with its own 25-hp hydrostatic drive unit, resulting in a true zero-turning-radius, high-ground-speed, contouring mower.

A wider wheel base and lower center of gravity provide greater side hill stability and safer cutting conditions on severe terrain. Add headlights for night cutting and taillights and flashers for safer road travel.

Phone 800/515-6798 for the LasTec dealer nearest you, or

Circle No. 267



Bush Hog improves side-mount rotary mower

Performance of Bush Hog's SM-60 side-mount rotary cutter has been improved through several new features. The increaser housing has been eliminated by connecting the PTO driveline directly to the hydraulic pump. The hitch is now Cat II standard and CatII/III quick hitch. Available horsepower at the cutter head has been increased. The PTO shaft is included in the base unit. The hydraulic output of the pump has been increased.

"These improvements will help people who cut along roadways, lake dams, drainage ditches, embankments and sloping terrain do it more effi-



ciently," said Robert O. Moore of Bush Hog. The SM-60 delivers a 5-foot-wide cut with a maximum reach of the cutter head of 12 feet from the tractor center line. Operation is all hydraulic.

For more information contact Bush Hog at 334/872-6261, or

Circle No. 268

Scag STHM Hydro Rider runs cool

Scag has designed its STHM Hydro Rider for more productivity, performance and profits. The high-capacity hydro cooling system features a 13 quart nylon reservoir and heavy-duty cooling radiator for cooler running, resistance to contamination and longer component life. The state-of-the-art drive system provides smooth, even power to both wheels and single-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 grass catcher with auxiliary engine, an easy-to-install mulching plate and an electric deck lift. Check with Scag Power Equipment at 414/387-0100, or

Circle No. 269

Customize the Prowler to your needs

Two engine options, two deck options, two tail wheel options. Encore's Prowler front cut riders have all the heavy-duty specs

commercial cutters need.



Options include:

- 52" or 61" cutting decks,
- 20-hp water-cooled

Kawasaki or 22-hp air-cooled Kohler engines,

- single or dual tail wheels,
- dual path hydrostatic

drive,

- zero turning radius.

For more information about the Prowler call 402/228-4255, or

Circle No. 270

Looking for pavers? These are new

The Florastone Collection has Calla Lilly, Tiger Lily, Rose, Orchid and Field Stone companion "Textured" Molds. These pavers are available in 16" x 16" x 1-1/2", for garden pathways.

Molds are made from industrial strength urethane. Stones can be made in any color. Stones retail in California for \$9.95 apiece.

Long-lasting molds are available in a minimum order of four flowers and field stones at \$150 plus \$15 shipping. Contact the Florastone Collection at 15840 Ventura Blvd., #201, Encino, CA, 91436; 818-761-6959.

Circle No. 272



The DewEze for multi-terrain mowing

The DewEze ATM-72 (All Terrain Mower) is the safe solution for multi-terrain, cost-effective mowing equipment. It's powered by a 27-hp, air-cooled diesel engine and features fully hydraulic, floating mower decks. A hydrostatic control and auto-leveling system keep the operator fully and



safely upright on slopes.

Other features include: quick, tight turns with rear discharge, simple blade maintenance, and an operators seat designed for maximum safety.

Call 800/835-1042 for more information, or

Circle No. 273

Bunton BZT can cruise

The Bunton Division of Jacobsen Textron offers the BZT 31 Liquid-Cooled zero turn rider powered by a 31-hp Briggs & Stratton Daihatsu gas engine.



It features a 72-inch cutting width with forward travel speeds up to 9.5 mph. Other features include: electronic deck lift and height adjustment system, large tires and wider wheelbase, easy service access, and optional ROPS.

For the lowdown on the BZT 31, telephone 502/966-0550, or

Circle No. 271

“Joining ALCA was the best investment I ever made.”

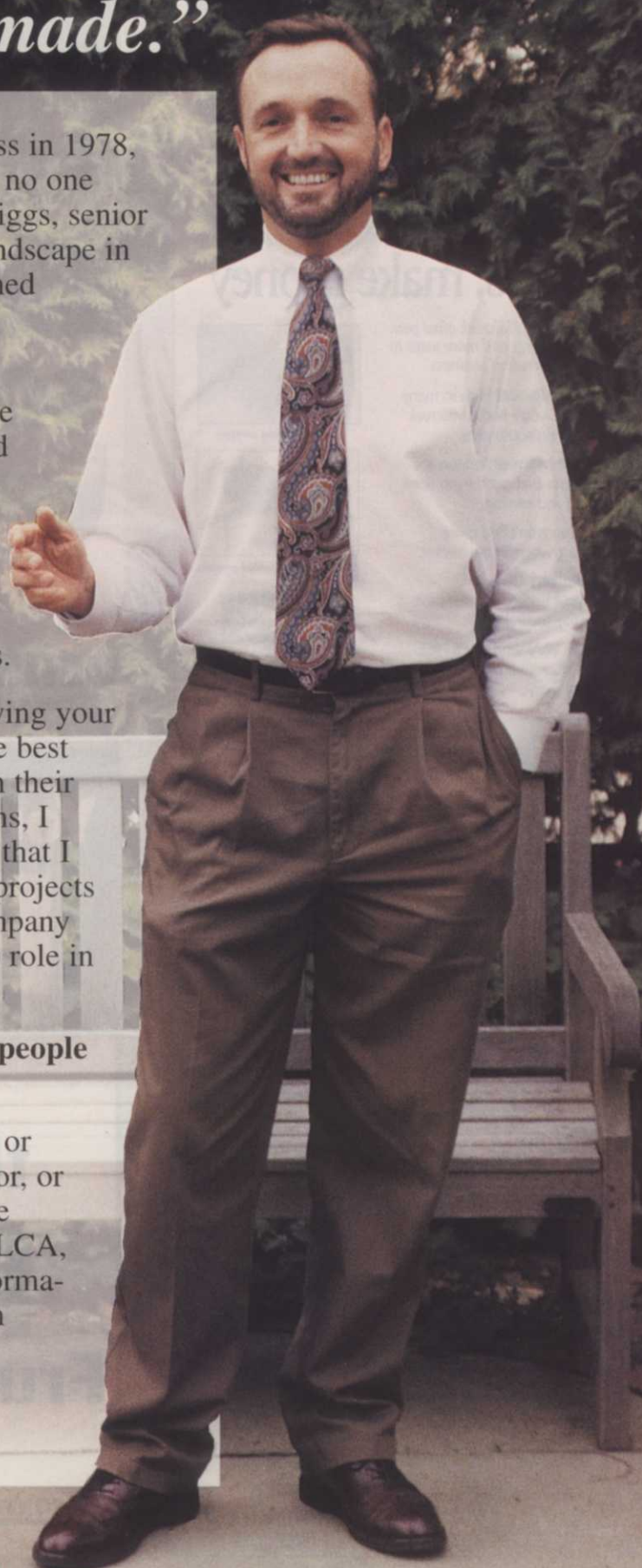
“When I started in this business in 1978, I had a lot of business questions no one was answering,” says Judson Griggs, senior landscape architect at Lied’s Landscape in Sussex, Wis. “That’s when I joined ALCA.”

“By networking with ALCA members from around the country, attending marketing and technical seminars and using the Operating Cost Study to estimate projects, I have helped my company to achieve record sales revenues of more than \$10 million dollars.

“If you are serious about growing your landscape business, ALCA is the best resource in the country. Through their meetings, videos and publications, I learned cutting-edge techniques that I applied immediately to various projects which ultimately helped the company evolve and sustain its leadership role in the marketplace.”

Join ALCA today and meet people like Judson Griggs.

If you are an exterior, interior or landscape maintenance contractor, or simply want to see the landscape industry grow, call (800) 395-ALCA, or (703) 736-9666 for more information, or write: ALCA, 150 Elden Street, Suite 270, Herndon, VA 20170. Fax (703) 736-9668.



ASSOCIATED LANDSCAPE CONTRACTORS OF AMERICA



8 models of 3 point hitch aerators

Poke holes, make money

When it comes to aeration, Millcreek gives you more choices, faster delivery, and more ways to help you promote your aeration business.

Models to Fit Your Equipment With so many models to choose from, you'll find a Millcreek aerator to fit your existing equipment.

Rugged Construction Millcreek Aerators are no-nonsense workhorses that get the job done and keep on working and earning.

Affordable Prices You won't find more competitive pricing anywhere in the market.

Guaranteed Fast Delivery Order by 1PM Eastern time, your aerator shipped next business day or we pay the freight.

Free Offer Call today. We'll send you a FREE "Aeration for Profit" kit, with ad slick and reproducible handout flyer.



14 Front-mount aerators



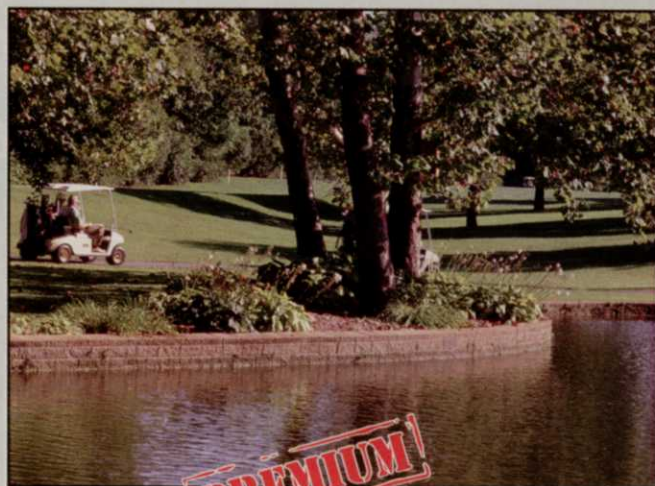
8 models of tow-behind aerators



Bird-in-Hand, PA 17505

1-800-879-6507

Circle No. 118



PREMIUM

SOLID UNITS



No other product can beat the durability and design flexibility offered by VERSA-LOK solid retaining wall units. No exceptions.

Call (800)770-4525 to receive FREE Design & Installation Guidelines and learn about the advantages of our solid units.



VERSA-LOK® Retaining Wall Systems

Oakdale, MN • (800)770-4525 • <http://www.versa-lok.com/wall>

Circle No. 141

INTRODUCING THE NEW

TRC Commander and Sidekick FM

Booth # 555
Landscape Industry Show

- Operates All 24VAC Systems
- Three Years Warranty
- 5 Miles of Range
- PDT FM Transmission
- One 9V Battery
- Automatic Resetting Fuse
- Receiver built-In-Safety Default



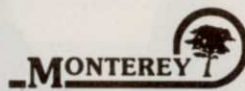
Remote Control Technology

(800) 275-8558

Circle No. 132 on Reader Inquiry Card

You Got Nuisance Fruit?

We have the answer
Florel®
Fruit Eliminator



Lawn and Garden Products, Inc.
209/499-2100
www.montereylawnandgarden.com

Circle No. 120

Everywhere You Look - There We Are!



Ranked Among the Best Franchise Opportunities in America!

Success Magazine GOLD 100	Entrepreneur Magazine Franchise 500	Income Opportunities Platinum 200	Business Start-ups The Top 150
-------------------------------------	---	---	--

- Proven Leaders in the Lawn Care Industry
- 17 year Track Record of Successes
- In-depth Training
- Exclusive Territory
- Extensive Support



Call Roger Albrecht at: **1 800-982-5296**

Attention Landscapers!

NEW T-60 Series II HydroSeeder®

- Returns purchase price in as little as 8 acres.
- The ideal machine for residential and small commercial projects.
- Optional operator's platform expands your opportunities.



Call 1-800-543-7166
for a FREE Information Kit!

FINN
CORPORATION®

9281 LeSaint Drive, Fairfield, OH 45014
Phone (513) 874-2818 • Toll Free (800) 543-7166 • Fax (513) 874-2914

* Based on list price, 15% down, 48 month lease-purchase. Taxes and optional Tower/Hose-Reel not included. HydroSeeder® is a registered trademark of Finn Corporation.

Circle No. 110

Our Transplant Patients Have Fewer Rejections



MYCORRHIZAE

Mycor™ Tree Saver™ Mycorrhizal Fungi Inoculant Dramatically Reduces Transplant Losses, Three Ways:

- 1. Mycorrhizal Fungi:** These endo- and ectomycorrhizal fungi enhance water and nutrient uptake, and improve resistance to disease and environmental stress.
- 2. Terra-Sorb™:** Water-absorbent hydrogel ensures water availability to prevent drought.
- 3. Biostimulants:** Organic seaweed, yucca extracts and humic acids stimulate root growth and aid in rapid establishment.

Order Mycor™ Tree Saver™ Now, and Receive Healthy Start™ Biofertilizer Tablets, FREE!

When you place your first order for 150 - 3 oz. handy paks or a bulk 5-gallon pail of Tree Saver™, we'll include a 10 lb. box of Healthy Start™ 12-8-8 Biofertilizer Planting Tablets to help get your plantings off to the best possible start. In addition to natural organic nutrients and humic acid, Healthy Start™ Macro Tablets contain the slow-release nitroform fertilizer, along with nitrogen-fixing and phosphorus solubilizing bacteria, which new plantings need to take hold... and take off!



Plant Health Care, Inc.
440 William Pitt Way, Pittsburgh, PA 15238
1(800)421-9051

www.planthealthcare.com

Mycor™, Tree Saver™, Terra-Sorb™ and Healthy Start™ are trademarks of Plant Health Care, Inc.
©1997 Plant Health Care, Inc. Offer expires June 1, 1998.

25F98T2

Circle No. 128

It's Time To Kick Some Brass!



WEST AG IRRIGATION PRODUCTS

PH: 213-224-3760 • 800-521-4377

FX: 213-223-4297 • 800-237-3807

Made and assembled in the USA

Circle No. 143

Tanaka

The Best Professional
Trimmer Value in the
Industry!

\$299.99*



Tanaka
TBC-2510
Grass Trimmer / Brushcutter

- 24cc, 1.3 hp Engine
- BRAIN® Fully Automatic Trimmer Head
- Solid-Steel Drive Shaft
- Heavy-Duty Anti-Vibration System
- Weighs Only 12.4 lbs.

Go for the...

win

Wise Investment Now

Call (253) 395-3900 for your nearest Tanaka Dealer.
* U.S. Suggested Retail based on Distributor Participation.

Circle No. 119

IT'S NOT EASY BEING Green

BUT IT JUST GOT EASIER.



Faster Results. Fewer Hassles.

Flexx™ is a potent, dry water soluble biostimulant with fully-chelated micronutrients, nitrogen fixing and phosphorus solubilizing bacteria and Yucca extract wetting agent. The fast-acting Flexx™ formula stimulates root growth, improves resistance to stress and disease, and promotes greener, denser turf that plays more consistently.



Damaged Green not treated with Flexx

Packaged in pre-measured 7 lb. bags that treat 1 acre, dry Flexx™ Turf Premix costs less per application, ships more economically, stores more efficiently and won't freeze, separate, degrade or ferment on the shelf like most liquid biostimulant products.



Damaged Green treated 3 times with Flexx™ after 2 months



Plant Health Care, Inc.
440 William Pitt Way, Pittsburgh, PA 15238
1(800)421-9051
www.planthealthcare.com

Call for a Free Sample of Flexx™

Flexx™ is a trademark of Plant Health Care, Inc. ©1997 Plant Health Care, Inc. 24F98G6

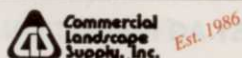
Circle No. 129



STOP! You Need it... We've got it!

The right product at the right price, right away!

Over 3,000 landscape maintenance tools and supplies in-stock & ready to ship



CALL TODAY for our money saving catalog
1-800-635-8686

See you at the CLCA show booth # 1157

Circle No. 144

INFORM ♦ INTRODUCE ♦ INFLUENCE ♦ INSTRUCT

REPRINTS

Reprints of *Landscape Management* articles, advertisements, news items or special announcements are available through Advanstar Marketing Services. Customized to meet your specific needs, reprints are highly effective when you use them to:

- Develop direct-mail campaigns
- Provide product/service literature
- Create trade show distribution materials
- Present information at conferences and seminars
- Train and educate key personnel, new hires
- Enhance press kits
- Compile reference materials
- Track trends and emerging technologies

ARTICLES
NEWS ITEMS
ADVERTISEMENTS

LANDSCAPE
management

ADVANSTAR MARKETING SERVICES
1-800-736-3665
216-891-2744
Fax: 216-891-2740

FOR SALE

FOR SALE

NEARY Model #300 lapping machine w/materials. Used twice. Asking 200.00.

Contact:
Tom Sprague, 7500 Old Oak Blvd.,
Middleburg Hts., Ohio 44130
440-891-2774



LANDSCAPE DESIGN KIT 3
48 rubber stamp symbols of trees, shrubs, plants & more. 1/8" scale. Stamp sizes from 1/4" to 1 3/4". \$78.50 + \$6 s/h VISA, MasterCard, or MO's shipped next day. Checks delay shipment 3 weeks. CA add 7.75% Tax.
AMERICAN STAMP CO.
12290 Rising Rd. LM98, Wilton, CA 95693
Phone or FAX orders to: 916-687-7102
Fax On Demand
INSTANT 5 PAGES of STAMP INFO. Call From YOUR FAX 707-429-0999 Doc #319

"WE'RE NOT JUST PARTS"



Equipment Accessories Engines
Lowest Prices Guaranteed

Free 200 + Page Catalog
Call: 1-800-222-4303

For Classified Advertising Information:

Bill Smith

Phone: 440-891-2670,

Fax: 440-826-2865

Email: bsmith@advanstar.com

LANDSCAPE management

1998 CLASSIFIED ADVERTISING

For all ads under \$250, payment must be received by the classified closing date. We accept VISA, MASTERCARD & AMERICAN EXPRESS. Credit card orders are accepted by phone.

ISSUES	CLOSING DATES
April 1998	3-10-98
May 1998	4-9-98
June 1998	5-8-98
July 1998	6-10-98
August 1998	7-9-98
September 1998	8-10-98
October 1998	9-10-98
November 1998	10-8-98
December 1998	To Be Announced

(Please call Sales Rep to confirm dates.)

For Classified Advertising Call:

Bill Smith, 440-891-2670,
1-800-225-4569 (ext. 670),
Fax 440-826-2865,
email bsmith@advanstar.com

MISCELLANEOUS



40 x 60 x 12 \$7,523

Build It Yourself And Save 10,000 Sizes, All Bolt-Together All Steel Buildings. Call Today For A Price Quote And A Brochure.

HERITAGE BUILDING SYSTEMS
800-643-5555
www.metalbldg.com

NEW PRODUCTS

Turf Shield®



The Newest Weapon in Goose Control!!

CALL 1-907-277-7378 for info and pricing

Move your Geese
Move the Poop!!!

Order NOW for Spring

American Pest Management
403 East Fireweed
Anchorage, AK 99503
fax: 907-344-3978

LANDSCAPE management

Every month the Market Showcase offers readers of *Landscape Management* a complete and up-to-date section of the products and services you're looking for. Check it out every month, or you might miss out.

For all ads under \$250, payment must be received by the classified closing date. VISA, MASTERCARD, & AMERICAN EXPRESS accepted. Send to: Advanstar Marketing Services, 7500 Old Oak Blvd., Cleveland, OH 44130

BOX NUMBER REPLIES: *Landscape Management*, LM Box #, 131 W. First St., Duluth, MN 55802

FOR ADVERTISING INFORMATION AND AD PLACEMENT, CONTACT: BILL SMITH, 440-891-2670, 1-800-225-4569, (ext. 670), Fax 440-826-2865, Email smith@advanstar.com

SHREDDERS

Topsoil Shredders THE SCREEN MACHINE®
800-837-3344



7001 Americana Parkway
Reynoldsburg, OH 43068

SOFTWARE

TRIMMER

Software for the Landscape Contractor



An Estimating, Billing, Routing, Site Scheduling, and Customer Tracking Tool to Make Your Life Easier!

Priced at just \$495.00

For a FREE Demo Disk contact us at TRIMS Software International, Inc. 3110 North 19th Avenue, Suite 190 Phoenix, AZ 85015 (800) 608-7467 • Fax: (602) 277-8029
www.trims.com

LANDSCAPE management

DIRECT MAIL

List

targeted, influential audience:

- ▶ 50,000 decision makers
- ▶ Highly responsive
- ▶ 98% deliverable guaranteed
- ▶ Selects available

FOR DETAILS CONTACT

Michael Balzano
440-891-2697

LANDSCAPE management

Every month the Market Showcase offers readers of *Landscape Management* a complete and up-to-date section of the products and services you're looking for. Check it out every month, or you might miss out.

For all ads under \$250, payment must be received by the classified closing date. VISA, MASTERCARD, & AMERICAN EXPRESS accepted. Send to: Advanstar Marketing Services, 7500 Old Oak Blvd., Cleveland, OH 44130

BOX NUMBER REPLIES: *Landscape Management*, LM Box #, 131 W. First St., Duluth, MN 55802

FOR ADVERTISING INFORMATION AND AD PLACEMENT, CONTACT: BILL SMITH, 440-891-2670, 1-800-225-4569, (ext. 670), Fax 440-826-2865, Email smith@advanstar.com

HELP WANTED



COME JOIN THE COMPLETE TEAM!

"One of the Washington, DC areas largest; award winning; full service companies..."

Due to rapid growth, we are now SEEKING high energy, goal driven, visionary, talent for the following positions:

SALES/ACCOUNT REPRESENTATIVES

Must have proven track record, degree or industry related experience. Duties to include Landscape Maintenance and Enhancement Sales, Marketing, Client Relations, Quality Control, Budgeting.

Successful applicant shall receive excellent compensation, benefits and incentives.

FOREMAN/PROJECT MANAGERS For Maintenance & Installation Departments

Applicants must have 3 to 5 years experience as foreman with strong inter-personal skills, pro-active and organized. Great opportunity to elevate career for motivated individuals. Top pay, year round employment, and many more benefits.

Send Resume Now To Human Resources:

Complete Industries, Inc.
1641 Maryland Route 3 North, Suite #206
Crofton, Maryland 21114
Phone: 301-261-0050, Or Fax To 301-261-0928

SALES PRODUCTION SUPERVISORS FOREPERSONS

HEYSER LANDSCAPING, INC., continuing to build on a 70 year tradition of top quality maintenance of interior and exterior landscapes, has career opportunities in New York, New Jersey, Pennsylvania and Delaware.

HEYSER is seeking experienced, goal-oriented individuals for sales and production of commercial accounts. Competitive wages and full benefits package, including major medical, dental, 401-K and bonuses.

Excellent working environment and opportunity for advancement. If you are interested in working for a well established and still growing company, mail, fax, or e-mail resume with salary requirements to:

HEYSER LANDSCAPING, INC., ATTN: MARIE
400 NORTH PARK AVENUE NORRISTOWN, PA 19403
FAX: 610-539-3116 / E-MAIL: cheyser123@aol.com
Immediate and confidential consideration.
Pre-employment drug screening. EOE.

HELP WANTED

"A REAL OPPORTUNITY TO GROW"

OUR COMMITMENT TO EXCELLENCE IN THE LANDSCAPE INDUSTRY HAS RESULTED IN AN OVERWHELMING DEMAND FOR OUR SERVICES. OUR GROUP IS HARD WORKING, TALENTED, AND UNDERSTANDS QUALITY AND CUSTOMER SERVICE.

IF YOU SHARE OUR VALUES, CONSIDER BEING A PART OF OUR FUTURE.

For additional information call:
Michael D. Stewart
1-800-548-6063

FAX your resume to
732-548-4359

Attn: Personnel Dept.



Grounds maintenance - site managers:

Davey Commercial Grounds Management, a division of The Davey Tree Expert Company - has a variety of career opportunities for experienced landscape/grounds maintenance professionals. Responsibilities include staffing and coordination of large on-site landscape maintenance projects. Qualifications: 5+ years field experience with solid horticultural skills in turf, ornamental and annual plant maintenance, personnel management, job scheduling and estimating. Top-rated candidates will be good communicators, organized, motivated, bi-lingual, customer-focused and understand an income statement. Excellent salary and benefit package available. Send your resume to: "Davey - Grounds Management Opportunities" at 1500 N. Mantua St., Kent, OH 44240 or fax to: 330-673-5406.

HELP WANTED

One of No. VA's Most Successful Landscape firms has opening for Designer/Estimator & Production Manager. Must have minimum of 2 years experience. Excellent growth opportunity and benefits package.

Call 703-352-7555

LANDSCAPE MAINTENANCE

EVERGREEN SERVICES CORP. is an industry leader in the commercial landscape management field. We have nine satellite shops in Western Washington: Everett, Maltby, Issaquah, Bellevue, Seattle, Kent, Poulsbo, Tacoma & Olympia. We are currently seeking motivated individuals for the following positions: Division Superintendent, Foreman (M/F), Crewleader, Irrigation Technician and Horticultural Technician. Celebrating 30 years in business, we offer career opportunities for the experienced supervisory and technician candidates.

All candidates must have experience in all phases of landscape maintenance; pruning, turf management, tree, shrub, annuals & perennials care, and irrigation systems management, plus possess a valid Washington State Driver's License. Candidates must be reliable, self-motivated, organized, flexible and possess excellent team building skills. Spanish language skills helpful.

We offer competitive wages and an excellent benefits plan; Medical/Vision/Dental/Disability/Life, Payroll Savings Plan, 401 (k) Profit Sharing Plan, tuition reimbursement, Vacation/Holiday/Sick Leave, support in acquiring industry certification. We are an equal opportunity employer by choice, and encourage women and minorities to apply.

EVERGREEN SERVICES CORPORATION
12010 SE 32 STREET
BELLEVUE, WA 98005
800-726-1751
(FAX) 425-641-0592

GREAT CAREER OPPORTUNITIES:

LEADING CHARLOTTE, N.C. LANDSCAPE COMPANY IS CURRENTLY SEEKING HIGHLY QUALIFIED, SELF-MOTIVATED PROFESSIONALS.

POSITIONS INCLUDE:

- IRRIGATION MANAGER
- MAINTENANCE FOREMAN
- LANDSCAPE FOREMAN
- COLOR SPECIALIST
- LANDSCAPE DESIGNER
- PLANT PURCHASER
- LANDSCAPE BILLING/JOB TRACKING SPECIALIST

WE OFFER EXCELLENT STARTING SALARY, INSURANCE, FRIENDLY WORKING ENVIRONMENT, BONUSES, VACATION, PROFIT SHARING, AND 401(K) PROGRAM. FOR CONFIDENTIAL CONSIDERATIONS, SEND RESUME TO:

THE METROLINA LANDSCAPE COMPANY
P.O. BOX 669003
CHARLOTTE, NC 28266-9003

PROFESSIONAL SALESPERSON NEEDED

Looking for a very aggressive person with a minimum of 3 years experience in professional sales to develop commercial and residential design/build landscape clientele. This position would consist of client prospecting, professional presentations, and client follow-up. Experience and education in the landscape industry required. Excellent earning potential with a salary compensation package tied to performance. Please send resume to:

TERRAFIRMA, INC.
3780 E. Morgan Road, Ypsilanti, MI 48197

LANDSCAPE DIVISION MANAGER

Well established full service, high end commercial/residential firm located in southern West Virginia has an immediate opening for a self motivated, detailed oriented person with clear communication skills. Successful candidate must have proven leadership skills, ability to manage all facets of daily landscape operations and installations. Capable of supervising multiple crews, job estimating and sales. Generous compensation package and great working environment. Excellent career opportunity. Starting salary 35K to 42K with performance bonus plan. For confidential consideration, please send resume to ASPEN CORPORATION P.O. BOX 737, DANIELS, WV 25832 OR CALL 304-763-4573. FAX 304-763-4591.

Classifieds Work!

HELP WANTED

Join America's leading irrigation and landscape lighting distributor, Century Rain Aid, as we continue to grow. Century is now accepting applications for branch management positions in the Northeast and Mid-Atlantic markets. Irrigation experience and a college education are preferred. Century offers industry competitive wage and benefit programs. Please send your resume and salary requirements to:

Century Rain Aid, 31691 Dequindre Rd.,
Madison Heights, MI 48071, Attn: Wayne Miller.

Pre-employment drug screening required.
Century is an Equal Opportunity Employer.

Maintenance and construction Sales/Supervisor: Rapidly expanding landscape contracting firm has immediate opening for a highly motivated individual to design, estimate and oversee construction and maintenance contracts. Experience preferred will consider recent grads who are self motivated and have good organization and presentation skills. Salary and benefits negotiable. Excellent opportunity for growth and advancement. Mail or Fax your resume with desired compensation to; **John R. Greer IV, Greer Landscaping & Maintenance, Inc., 13301 Southwest Highway, STE E, Orland Park, IL 60462, 708 361-5638 FAX.** 3/98

FIELD OPERATIONS MANAGER MAINTENANCE DIVISION Are you aggressive with strong organizational and communication skills and like challenges? Do you have 3 to 5 years experience running day-to-day field operations comprised of 75 employees or more? We are a well established full service landscape company looking for a field manager to oversee several areas supervisors and day-to-day field operations. Located in the Arizona's Greater Phoenix area, we have been in business for over 23 years. If you are the right person for the job - we are offering a generous salary, company vehicle, health and dental insurance, 401-K with generous company match, and profit sharing. Our starting package is \$30,000 to \$45,000 depending on past success and experience. 5 years minimum experience in the landscape industry. Please send your resume to 12629 North Tatum Blvd. Suite 236, Phoenix, AZ 85032. 2/98

KEEP YOUR CREWS BUSY ALL WINTER LONG. LANDSCAPERS...Buy manufacturer direct professional synthetic turf putting greens for home and commercial use. Dealer Program includes Exclusive Distribution Area, Market Research Report, carry NO inventory, many extras **FREE VIDEO** 1-800-334-9005 2/98

NATIONAL Sprayer Company Wants YOU As A DISTRIBUTOR! New company producing top quality sprayers suitable for golf course, lawn care, nurseries, and municipalities, is now accepting applications for qualified distributors. Call 1-800-710-9446 for information on how you can make money with us! 2/98

GARDEN CENTER RETAIL MANAGER Well established company is searching for individual with retail management experience. Great opportunity for a career. Salary DOE. Submit credentials and employment references to Avery & Assoc., 8120 Green St., New Orleans, LA 70118 2/98

Golf Course Horticulturist. Year Round position of installation & maintenance of Landscape & Flower bed areas. Salary \$20-25,000 and benefits. Experience and education preferred. Send Resume By Feb 28 to Beechmont Country Club, 29600 Chagrin Blvd., Cleveland, OH 44122. Please no phone calls. 2/98

Excellent opportunity to join a growing Chicagoland industry leader as **Sales Manager, Commercial Salesperson** or **Design/Salesperson**. We seek accomplished, highly motivated individuals w/on-target estimating capability & proven sales techniques. Expected commercial volume 1 million+ & residential \$600,000+. Manager to coordinate and enhance sales efforts for Maintenance, Construction and Nursery operations. We offer an excellent salary w/commissions & great benefits (co. vehicle, insurance, 401(k), etc.) all in a friendly environment w/advancement potential. Work out of either our Naperville or Wauconda office. For immediate confidential consideration, please call Maureen (847)526-4554 or fax/send resume & salary history to: 610 W. Liberty St., P.O. Box 448, Wauconda, IL 60084 (847)526-4580. EOE. 2/98

Assistant Professor, Environmental Horticultural Science Department. Full-time teaching position, tenure-track, academic year appointment. Develop and direct a turf management program, teach undergraduate classes, advise students, supervise enterprise and senior projects, and establish applied research activities in related areas. Specific courses to be taught will include beginning and advanced turf management, and may include landscape/floral design fundamental courses or other lower division horticultural fundamental courses. Salary commensurate with qualifications and experience. Preferred starting date: Fall 1998. Minimum qualifications: Ph.D. in Horticultural Science or closely related field; a demonstrated commitment to and involvement with the science and practice of ornamental horticulture; strong undergraduate teaching skills and academic background; and experience in turfgrass management. Additional experience in landscape design and landscape horticulture is highly desirable. To obtain an official application, send a resume and names of three references to Virginia R. Walter, Department Head, Environmental Horticultural Science Department, Cal Poly, San Luis Obispo, CA 93407; (805)756-2279, FAX (805)756-2869; vwalter@calpoly.edu. (Refer to Recruitment Code 83045). Closing date: May 1, 1998. *Cal Poly is strongly committed to achieving excellence through cultural diversity. The university actively encourages applications and nominations of women, persons of color, applicants with disabilities, and members of other underrepresented groups.* AA/EEEO. 2/98

MAINTENANCE SUPERVISORS The Brickman Group, Ltd., one of the nation's largest and fastest growing full service landscape companies, has an immediate need in principal cities east of the Mississippi for maintenance supervisors with 2-5 years experience. Brickman seeks energetic, team oriented college graduates with proven leadership, communication and interpersonal skills. Brickman offers full-time positions, excellent advancement opportunities and exceptional compensation and benefits with an industry leader building on a 56-year tradition of uncompromising customer service. For immediate confidential consideration, please send or fax your resume with an indication of your geographic preferences and willingness to relocate to: **The Brickman Group, Ltd., Corporate Office, 375 S. Flowers Mill Road, Langhorne, PA 19047, 215-757-9630, EOE.** 12/98

Landscape Installation Foreman—Carroll County Landscape is looking for an experienced foreman, skills should include training, communicating and working well with crew members, salary commensurate with experience, benefits include profit sharing and continued education. Send resume to: P.O. Box 237, Wolfeboro Falls, NH 03896 or fax (603)569-2013 2/98

EXCITING CAREER OPPORTUNITIES FOR VEGETATION MANAGERS Rapidly growing Vegetation Management Company is looking for experienced Division Managers to work out of our regional and branch locations throughout the U.S. Must have a minimum of two (2) years experience in Vegetation Management and/or a degree in horticulture/arbiculture/urban forestry or related field. Must be self-motivated, decisive, creative and have strong organizational skills. **WE OFFER:** —Excellent starting salary, —Company paid health insurance, —Excellent working environment, —Bonuses, —Vacations, —401 K Program. For career opportunity and confidential consideration, send or fax resume, including geographic preferences and willingness to relocate to: **DeANGELO BROTHERS, INC.,** Attention: Paul D. DeAngelo, 100 North Conahan Drive, Hazleton, PA 18201, Phone: (800)360-9333, Fax: (717)459-5500. EOE/AAP M-F 2/98

FLORAPERSONNEL, INC. In our second decade of performing confidential key employee searches for the landscape/horticulture industry and allied trades worldwide. Retained basis only. Candidate contact welcome, confidential, and always free. 1740 Lake Markham Road, Sanford, FL 32771. PHONE (407)320-8177. FAX (407)320-8083. Email: Hortsearch@aol.com. Website: <http://www.florapersonnel.com>. 12/98

GreenSearch—Attention Employers...can't find good managers and supervisors? Or maybe you're a job seeker looking for a new opportunity? We can help you! Serving Green Industry company categories throughout the Southeast U.S. Candidates pay no fee. Call GreenSearch toll-free at 1-888-375-7787, Fax (770)392-1772. GreenSearch, 6690 Roswell Road, #310-157, Atlanta, Georgia 30328-3161, www.greensearch.com. 3/97

Seeking the Green Industry's Best Sales Manager An established Southeast-based leader in professional landscaping and maintenance has an immediate opening for a fully qualified and productive sales and business development professional. The ideal candidate will possess a proven track record of success in commercial and high-end residential sales and a bias toward building long-term relationships. Skill and experience in estimating and design would be helpful. Interested and qualified candidates should either telephone, fax or mail their resume to: GreenSearch, 6690 Roswell Road, Suite 310-157, Atlanta, Georgia 30328-3161. Toll-free 1.888.375.7787 Fax 770.392.1772. 2/98

Sales Turf & Tree Professionals: Growth Products, a manufacturer of Liquid Fertilizers, and Natural Organics seeks experienced professionals in the golf and tree markets. Openings for Texas, Northcentral and Southeast territories. Salary + commissions, and company vehicle. AS or BS in turf management or related field, willing to travel, sales skills. Send/fax resume to Growth Products, PO Box 1259, White Plains, NY 10602 914-428-2780. 2/98

Operations Manager Hermes Landscaping, recently selected as one of the Top 100 landscape management companies in the nation has an immediate opening for an operations manager. Individual supervises all activities of production including staffing, work schedules, purchasing, quality control, safety, coordinating training and equipment maintenance. Candidates must have excellent organizational and people skills. Prefer candidates with bachelors degree. Send resume to: 12421 Santa Fe Trail Drive, Lenexa, KS 66215. 913-888-2400. EOE. 2/98

HELP WANTED

JASSO TREE SERVICE, INC.—A long standing tree company serving the Tri-county area since 1928. A drug free environment, dedicated to continued education. We are looking for a pesticide applicator/spray department manager. We are a full service tree company and need someone with a strong will to succeed. Degree helpful but not necessary. Good driving record and CDL a must. We have excellent benefits, paid holidays, vacations, retirement, and health insurance. Wages are open for discussion. Please call 243/391-0030 for an appointment. 2/98

LAKE CITY COMMUNITY COLLEGE is seeking qualified candidates for an Irrigation Management Program Instructor/Coordinator. Grant Funded Temporary Position (231 Duty Days). Minimum requirements Bachelor's degree and two (2) years experience in irrigation design, installation and repair in golf/landscape industries. Salary negotiable, based on degree and experience, plus benefits. Position will remain open until filled. Applications should be submitted to: **Human Resources Development, Lake City Community College, Route 19, Box 1030, Lake City, FL 32025-8703, (904)752-1822 Ext. 1314. VP/ADA/EO/EA College in Education and Employment.** 2/98

PROFESSIONAL LAWN CARE TECHNICIAN Excellent working conditions and salary. Vacation/holidays/ 401K/ health insurance. Work Monday-Friday. Must be self starter. Position is for a lawn nutrition applicator. Must have or be willing to obtain Mass. applicators license ASAP & relocate to central Mass (outside Worcester). Please call Rutland Nurseries, Inc. 508-886-2982 or fax resume to 508-886-2981. 3/98

SENIOR PESTICIDE APPLICATOR Longwood Gardens, Inc., the world's premier horticultural display, located in Kennett Square, PA has an opening for a Senior Pesticide Applicator. This person will oversee and perform pesticide spray operations in a variety of horticultural display environments, primarily outdoor specimen trees and shrubs. Other responsibilities include performing arboricultural duties such as tree climbing and aerial lift operation; operating, maintaining, and performing repairs to hydraulic spray equipment, and maintaining pesticide spray facility and related inventory. A Bachelor's degree or higher in an agriculturally related field with a minimum of 2 years experience in horticultural pesticide application is required. Further experience in Horticulture, Entomology, and/or Plant Pathology is a plus. Must have or be able to acquire a Pennsylvania Pesticide Applicator License and Pennsylvania CDL Class B driver's license. We offer an excellent starting salary and an outstanding benefits package. Please mail your resume to Mr. Kiran Taunk, Business Division Manager, Longwood Gardens, Inc., P.O. Box 501, Kennett Square, PA 19348. EOE. 2/98

Landscape Maintenance Operations Manager Expanding company, full service firm, headquarters 30 miles north of Boston in Georgetown, MA. Preferred candidates would have a minimum of 5 years management experience in the maintenance of commercial and single family developments. Responsibilities include: Client relations, managing, motivating, scheduling, training & staff development, supervise daily operations and quality control. This is an excellent career and earnings opportunity. Send confidential resume with salary requirements and references to: Attention: Manuel DeSouza, N.D. Landscaping, Inc., P.O. Box 114, Topsfield, MA 01983 2/98

LANDSCAPE DESIGNERS, LANDSCAPE CREW LEADERS AND TRAINEES Newtown Home & Garden Center, an established fast growing residential landscape nursery is seeking career minded people with 3-5 years experience, hardscaping exp. helpful. Excellent starting salary plus benefits (vacation, health and retirement). Designers must have estimating ability and proven sale techniques. This is a job for a pro who can design and organize. Crew leaders must have the ability to coordinate materials and equipment and capacity to run crews efficiently. Come work for a company that cares about their employees. For immediate confidential consideration send or fax resume and requirements to Martin at **NEWTOWN HOME & GARDEN CENTER, 398 DURHAM ROAD, NEWTOWN, PENNSYLVANIA 18940 215-860-3281.** 2/98

Golf Operations Supervisor-Skokie Park District seeks FT Golf Operations Supervisor to manage maint. of new Golf Center, Skokie Sports Park & Weber Park Golf Course. Golf Center will incl. two-tier driving range, adventure golf courses, batting cages, & athletic fields. Resp. for repair, development & construction of grounds of Golf Center and Golf Course. Resp. for training & supervising maint. staff. 1-3 yrs. golf course &/or driving range maint. exp. &/or 2-4 yr. degree in Agronomy, Horticulture, or related fields. Pesticide Public Applicator license req. \$27K-\$32K. Excellent benefits. Submit resume to: Skokie Park District, Danica Johnson, HR, 9300 Weber Park Place, Skokie, IL 60077. Fax#: (847)674-9201. 2/98

BUSINESS FOR SALE

Well established medium size \$500K landscape and snow removal business in the north suburbs of Chicago, is for sale to an energetic, ambitious, knowledgeable person, who would work the business on a buy-out basis. We are retiring after 40 years but will stay on to train. Reply in confidence and fax background to: (once in a lifetime opportunity) to 847-634-3910. 2/98

LANDSCAPE CONSTRUCTION & MAINTENANCE CO. Well estab. co. in the Boston, MA area. 1996 year-end \$2.5M volume, net \$335K, 1997 profits in six digit figures as well. Well run, great money maker. Owner is willing to stay on board but has other ventures. Selling at \$1.5M. Mail responses of interest with name and financial background to: (Great Opportunities) 271 Canton St., Stoughton MA 02072. 2/98

Owner retiring from well established **LANDSCAPING/MAINTENANCE** business in beautiful Northern Oregon. 200K sales with owner net profit over 60K. Price 180K includes 125 commercial and residential contracts, vehicles and equipment. Call (541)386-1942. 2/98

Commercial Lawn Care Company located in Atlanta, Georgia. Ten years in the north metro area. Sales average over \$420,000.00 annually. Selling price is \$305,000.00 for all accounts, trucks and equipment. Land and warehouse available. Fax all inquiries to 770-720-4842. 2/98

To Place a Classified Ad Call:
Bill Smith, Phone: 440-891-2670,
Fax: 440-826-2865, Email: bsmith@advanstar.com

EDUCATIONAL OPPORTUNITIES

NOW...Learn professional Landscaping and Gardening at home. Accredited program provides thorough training in all phases of commercial and residential landscaping. Diploma awarded. Free brochure describes program and opportunities in detail. Call 1-800-326-9221 or write Lifetime Career Schools, Dept: LF01Y1, 101 Harrison Street, Archbald, PA 18403. 12/98

Two year AAS degree program in Golf Course Maintenance Operations, Landscape Contracting, and one year Golf and Grounds Certificate. Fully accredited, VA approved, expanded learning facilities, new equipment. Graduate placement assistance available. Contact Golf Course Operations/Landscape Technology Dept., Western Texas College, Snyder, TX 79549. 915-573-8511 ext. 305 12/98

The Benefits Of CLASSIFIED ADVERTISING

IMPACT
Command immediate attention and get fast action with the dynamics of classified advertising!

EXPOSURE
Reach highly-targeted, market-specific business professionals, industry experts and prospects.

VALUE
Select from a variety of classified display options to meet specific needs on a timely basis cost-effectively.

RESULTS
Generate sales leads, maintain market presence, conduct market testing, promote existing lines, introduce new products and services, or recruit the best — bottom-line, classifieds offer you an excellent return on investment!



ADVANSTAR
MARKETING SERVICES

A Division of Advanstar Communications Inc.

Bill Smith
7500 Old Oak Blvd.,
Cleveland, OH 44130
800-225-4569, Ext. 670
bsmith@advanstar.com

FOR SALE

NEW NATIONAL SPRAYER COMPANY NOW PRODUCING TOP QUALITY SPRAYERS FOR TOP QUALITY COMPANIES! In the market for a new sprayer? We have the machine for you. We have forty years of manufacturing experience and have combined it with the top named components in the industry. Add all aluminum frames, reel mounts, and manifolds, and it becomes rust free. Add a belt drive to make it simple, troublefree, and easy to operate. The result is the best sprayer on the market for the money. Call Banko Manufacturing, Inc. at 1-800-710-9446 for Free details and pricing. Call by January 31st and mention this ad: you become eligible for early pricing discounts as well as a FREE strategy on how you can make extra money working with us. This is a limited time offer, so call now! You have absolutely nothing to lose! 2/98

Two 1994 Nissan Diesel 14,500 G.V.W. Cabover—Low Mileage. Each truck equipped with: Two Tufflex fiberglass tanks (one 600 gallon/one 100 gallon), Two complete electronic Hannah hose reels, Pumps are PTO driven, One large aluminum fertilizer box directly behind cabs (44" tall x 31" wide x 91" long). Beautifully set-up on complete 10 foot aluminum bed. Selling at a steal for \$27,500. **Green Thumb Lawn Care, Inc., Dallas, TX (972)727-9595 - Office, (972)727-1806 - Fax 2/98**

MOWER REPLACEMENT PARTS. FREE 200 page catalog **SAVE \$\$\$** on mower parts, air & oil filters, trimmer line, belts, plugs, oil, tools, water garden supplies. Mow More Supplies **1-800-866-9667** Order free catalog MM98LM. 5/98

MKI THE LANDSCAPERS SUPERSTORE™ WHOLESALE PRICES PARTS & SUPPLIES CALL FOR A FREE CATALOG 1-800-724-2229 BUY DIRECT & SAVE!!! 3/98

After 30 years in business Serving greater SE Minnesota **SCHULTZ LANDSCAPING, MINERAL SOD FARMS, CHOOSE AND CUT CHRISTMAS TREE FARMS and ORGANIC LAWN CARE** businesses are for sale/lease in part or parcel. For a complete inventory and equipment listing, please call 507-288-3999 or toll free at 1-800-934-7696. 5/98

FRANCHISE OPPORTUNITIES

FRANCHISE OPPORTUNITY Tired of running your business without any support? With a **NaturaLawn of America** franchise, you not only get comprehensive agronomy support through the use of our proprietary natural, organic-based fertilizers and biological controls, but you get to use our proven marketing strategies to easily grow your lawn care customer base to virtually the size you want. For info call us at **800-989-5444**; e-mail us at natlawn@erols.com; or contact us on the internet at www.nl-amer.com. 4/98

SERVICES

SPANISH TRANSLATION Business, technical and legal documents. Training manuals, notices, safety guidelines, benefits, company rules. 10 yrs' experience as Spanish translator for major California landscape management company. **LANGUAGE EXPRESS. TEL: (408)395-5917 FAX: (408)395-3457** evialo@compuserve.com 1/98

WHOLESALE DISTRIBUTOR

Needed to market environmentally friendly, liquid, slow-release fertilizer products direct from manufacturer. Ken Franke, P.O. Box 123, Plato, MN 55370; 800-832-9635. 12/98

Send Blind Box Replies to:
Landscape Management,
Classified Ad Dept.,
LM Box XXX,
131 W. First St.,
Duluth, MN 55802-2065
*(Please include box number
in address)*

AD INDEX

101	Advanta Seeds	24L
	ALCA(Reg)	67
102	American Cyanamid	47
103	American Cyanamid	7
104	Bayer Corp.	2-3G
105	Bayer Corp.	2-2L
106	Bayer Corp.	12-13G
107	Bayer Corp.	20-21L
108	Bush Hog	49
144	Commercial Landscape Supply	70
109	Dalton Gear Co.	11
	Dodge/Chrysler	53
	DowElanco/Reg.	57
	DowElanco	Cv2-1
110	Finn Corporation	69
111	Florists Mutual Ins.	19L
112	Grasshopper	Cv3
113	Howard Price Turf Equip ISK Bioscience	511 58 a-d
115	John Deere	5
116	Kubota	17
117	Lesco, Inc.	12-13L
118	Millcreek Mfg. Co.	68
120	Monterrey	68
	NE Reg. Turfgrass Found.	8
122	Nextel Communications	18
	Nitro-Green Corp.	69
	Novartis	16-17L
124	Nutramax	16G
125	Oregon Tall Fescue Com	55
126	pbi/Gordon Corp.	61
127	pbi/Gordon Corp.	3
	PGMS/Reg.	15G
128	Plant Health Care	69
129	Plant Health Care	70
130	Remote Control Tech.	68
131	Rexius	7
132	Riverdale Chemical	9-10
133	Rohm & Haas	9G
134	Rohm & Haas	8-9G
	Rohmid Ltd.	19-42
135	Scag Power Equipment	5L
136	Scotts Co.	11G
	STMA/Reg.	47
119	Tanaka	70
137	Tee-2-Green	Cv4
138	Terra	15G
139	Terra	15L
140	Toro	7G
	Turfgrass Trends	63
141	Versa-Lok Retaining Wall Systems	68
142	Walker Mfg. Co.	11G
143	West Ag Irrigation	69
	Winners Circle	23L

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

LANDSCAPE management

1998 CLASSIFIED ADVERTISING

For all ads under \$250, payment must be received by the classified closing date. We accept VISA, MASTERCARD & AMERICAN EXPRESS. Credit card orders are accepted by phone.

ISSUES	CLOSING DATES
April 1998	3-10-98
May 1998	4-9-98
June 1998	5-8-98
July 1998	6-10-98
August 1998	7-9-98
September 1998	8-10-98
October 1998	9-10-98
November 1998	10-8-98
December 1998	To Be Announced

(Please call Sales Rep to confirm dates.)

For Classified Advertising Call:

**Bill Smith, 440-891-2670, 1-800-225-4569 (ext. 670),
Fax 440-826-2865, email bsmith@advanstar.com**

Grab Bag

Solving turf stress a global concern

Maintaining turfgrass under excessive wear conditions was addressed during the International Turfgrass Research Conference in Sydney, Australia. Dr. Richard Hull, University of Rhode Island, reports that managers of turfed race tracks, athletic fields and some high-use golf courses must confront these problems. Rooting and media modifications, drainage and use of geotextiles and other mesh materials were all discussed. Hull reports that mesh materials appear to have some potential for stabilization, but much more R&D is needed.

"This problem is receiving much attention from the international turf community where the intensity and duration of sports turf use is such that maintaining high quality turf standards is all but impossible," says Hull.

Getting Taiwan fields up to speed

An international visitor to the recent Sports Turf Managers Association trade show meeting was ex-Olympian Chi Cheng (1960, women's 400 meters, Bronze), president of Swan Sports Co., Ltd. Cheng, who in 1970 held five world records in track and field, was at the show in Orlando to load up on information she says managers back home are in great need of.



Project wins for uniqueness

Winner of the California Landscape Contractors Association "Special Effects" award for 1997 is this renovation project by Creative Environments of Occidental, Calif. The residential project included removal of an existing pond, waterfall and patio, and the addition of a new Koi pond and tiered waterfall. Other additions include a new flagstone patio, a hand-made one piece, curved, wood bench, lighting, plants and irrigation. Designer was Cheryl Rauch.

Golf continues to grow

"It's expensive to build a golf course and to operate one, so it's only logical that it costs money to play. But people enjoy the game and are willing to pay for the privilege of golfing. As long as the economy is good and people have sufficient income for leisure time activities, things should continue to progress."

DAVID S. DOWNING II, CGCS, DIRECTOR OF GOLF COURSE OPERATIONS FOR WILD WING PLANTATION IN MYRTLE BEACH, SC.

Grab Bag features brief observations and prognostications throughout the green industry. If you have an unusual photo or comment you'd like to share with us, please send it in...

In ONE year, this **GRASSHOPPER** will **CUT** and **TRIM** grass, mulch, side-**DISCHARGE** and **BAG** clippings, bull-**DOZE** dirt, **THROW** snow, **VACUUM** leaves, **SWEEP** walkways, and **AERATE** soil.

(For every thing there is a SEASON.)

And for every season, Grasshopper has just the right attachments.

- **Year-round versatility.** A full line of attachments lets your Grasshopper zero-radius maneuverability work for you all year long. The exclusive Combo Mulching™ Deck*, with full-flotation option, lets you mulch, discharge or bag with the same deck for superior results in varying conditions.

Other attachments include Quik-D-Tatch Vac® grass collection systems, angle dozer blades, snowthrowers, rotary brooms, dethatchers and AERA-vator™. Quik-D-Tatch® mounting system* permits removing and adding attachments in minutes without tools.

- **Easy to operate.** Even beginning operators get the feel of Grasshopper's dual-lever steering in no time. So natural, operators can mow long hours without tiring.

- **Built-in quality.** Grasshoppers are built to last, with robotic-welded steel construction and highest quality components.

*patent pending



Call or write for the name of your nearest dealer and a "hands on" demonstration.

MOVE UP TO
GRASSHOPPERABILITY

grass'hop'per abil'i'ty n.



the ability to make all the right moves for mowing quality and timesaving productivity.



Heavy-duty multipurpose 48- and 60-inch dozer blades move dirt, sand, gravel and snow quickly and easily. The V-snow plow clears sidewalks.



PTO-driven 48- and 60-inch fixed angle rotary brooms handle dirt, debris and clean up to eight inches of snow. 60-inch bidirectional broom available.



PTO-driven 48- and 60-inch snowthrowers throw snow up to 20 feet away. Winter enclosure for all snow removal attachments provides protection from wind and snow.



40- or 60-inch AERA-vator™ penetrates hard, dry soil without irrigation. ROPS with overhead canopy is optional.



Durable 48- and 60-inch Tine Rake™ dethatchers remove thatch and surface aerate soil. Vinyl sunshade canopy protects operator from sun and heat.

First to Finish...Built to Last

GRASSHOPPER
YOUR NEXT MOWER

The Grasshopper Company
One Grasshopper Trail • P.O. Box 637
Moundridge, KS 67107 U.S.A.

Phone: (316) 345-8621 • FAX: (316) 345-2301
Circle No. 112 on Reader Inquiry Card

You've Just Spent \$40,000 to Build a Green

Now invest \$90 in the right bentgrass seed.

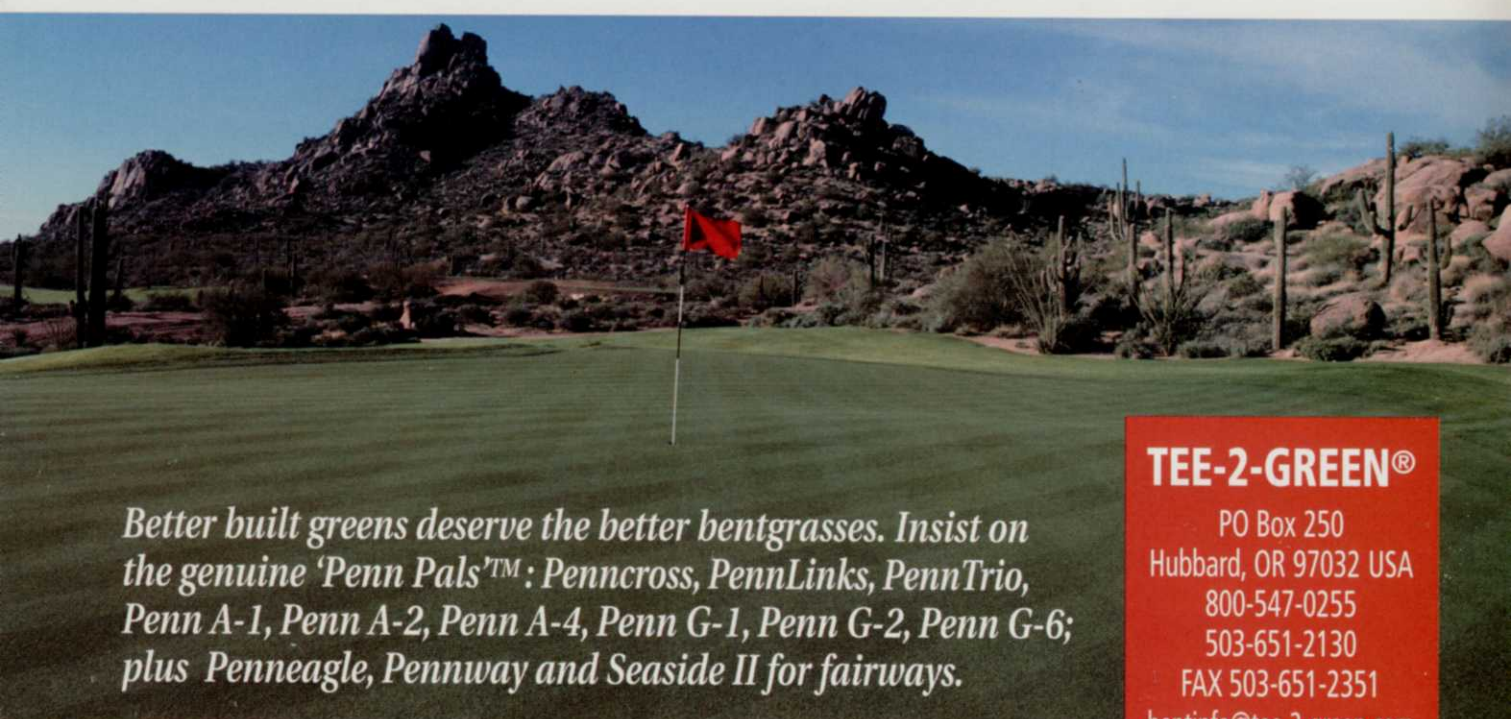
At \$4 to \$7+ per square foot, a 6,000 foot green can cost \$24 to \$50 thousand. No matter how you figure it; design, grading, tiling, gravel, sand and manpower, building a green is the most important part of any course. It would be foolhardy to plant an unproven bentgrass on a whim, or because it's a few cents a pound cheaper. Of course you're going to be cautious when your reputation's on the line. You're going to insist on the stellar new Penn A and G series bents from Tee-2-Green®, developed by Dr. Joe Duich, then tested—and selected—by some of the best superin-

tendents on some of the finest courses in the world.

Or, you won't go wrong with time-proven Penncross, PennLinks or PennTrio blend. With hundreds of thousands of pounds sold around the world, Penncross remains the best-selling bentgrass ever.

Oregon's best and most experienced bentgrass seed producers grow these exceptional creeping bents to the highest certification standards; free of any objectionable weeds.

It's good economy to seed with the new Penn A's and G's from Tee-2-Green®—*the icing on the cake.*



Better built greens deserve the better bentgrasses. Insist on the genuine 'Penn Pals'™: Penncross, PennLinks, PennTrio, Penn A-1, Penn A-2, Penn A-4, Penn G-1, Penn G-2, Penn G-6; plus Penneagle, Pennway and Seaside II for fairways.

TEE-2-GREEN®

PO Box 250
Hubbard, OR 97032 USA
800-547-0255
503-651-2130
FAX 503-651-2351
bentinfo@tee-2-green.com