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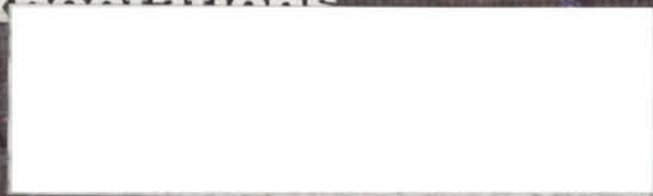
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AS WE SEE IT

JERRY ROCHE, EDITOR-IN-CHIEF



Servicing the reader: the ticket to quality in magazine publishing

My definition of quality: **dedicated, informed employees consistently giving customers exactly what they want.**

To that end, LANDSCAPE MANAGEMENT magazine takes its quest for quality to a new level with this month's issue.

In the past, we've conducted reader surveys—in which many of you have participated, thank you—to determine how well our magazine is being received, and if we are on target with our articles. Because of their unequalled value, these surveys will continue.

But this month, we're proud to become the first magazine in the green industry to boast a "Reader Advisory Panel" that features six of the most respected names in the industry.

These people are not suppliers. They are not researchers. They are not extension agents or other consultants. They are golf course superintendents, landscape contractors, athletic field supervisors and lawn care operators—just like you.

The panelists: Ken Gerlack, Twyla Hansen, Tim Hiers, Bill Prest, Mark Schlossberg and Brian Storm. (For more information, see "Hot Topics.")

All six have not only been around the industry for a long time, but they've been extremely active, and have probably come in contact with many of you.

With this panel, balance is the key. We've included two golf course superintendents, two landscape contractors, a lawn care operator and an athletic field manager—roughly the same proportions as our total readership. We've got a great geographical diversity, from Ken in California, to Tim in Florida, to Mark in Baltimore.

The formation of this select panel gives us a means of more efficiently delivering even more valuable information, each and

every month.

For instance, in the next few days, we'll be finding out exactly how those six panelists viewed this month's cover stories on mowing, and what they think of our "LM Reports" on coated fertilizer. We'll know if our "Tech Center" section about disease control was on the mark. And we'll get reactions—especially from our two golf course superintendents—on the interesting points concerning algal scum in the "Strictly Golf" section.

In the past two years, LANDSCAPE MANAGEMENT has made some fundamental and wide-ranging changes: in the information we deliver, the way in which we deliver it, and to whom we're delivering it. We are thankful that you, readers, have embraced our renewed commitment.

The green industry is changing. Unlike other magazines serving the industry, LANDSCAPE MANAGEMENT is changing along with it.

With our new "Reader Advisory Panel," you're assured of seeing more positive changes over the ensuing months.

It's not often in this column that you read anything self-serving. But we're proud of our new "Reader Advisory Panel," and proud of our effort to provide a quality editorial product to you. So please forgive us if we take a moment to puff out our chests.

LANDSCAPE MANAGEMENT

INCORPORATING LAWN CARE INDUSTRY

MAY 1993 VOL. 32, NO. 5

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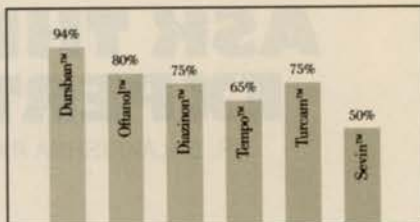
the right tactics, you can use a lot less and still get excellent results.

Here's a good example. By mixing insecticide with insecticidal soap, you can reduce the amount of insecticide you need on your

ornamentals by about fifty percent. Insecticidal soap controls most soft-bodied insects and mites. By adding insecticide, you'll also take care of tougher insects, like scales and worms. University studies

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cide gives you so much control at such a low rate. It's available in water-soluble packets. And it can be bio-monitored, which can reduce the likelihood of over-exposure.

Now, we realize you probably

Once your hate for insects environment.



first present at the same time the black locust tree blooms. Make your insecticide application then, and you'll get the most efficient, effective control.

Your insecticide it-

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If you want better results from the insecticide you use, insect traps can help. They allow you to find out when certain pest insects are present and time your insecticide applications accordingly. Insect traps are inexpensive, easy to use, and they'll help you get greater control using less insecticide.

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ASK THE EXPERT

DR. BALAKRISHNA RAO

Home-study courses in horticulture?

Problem: Are there any schools offering home-study courses in horticulture and landscape design for which a degree can be earned? (Pennsylvania)

Solution: I am not familiar with any schools offering home-study courses in horticulture and landscape design for a degree and/or no degree program. I will update you if I hear from our readers or other sources.

Earthworms and golf greens

Problem: How can I eliminate earthworms from penetrating my greens? The worms bore holes up through the turf, causing little mounds of dirt. When the greens are mowed, the mounds are left flat. This causes an uneven putting surface and an unattractive green. (New York)

Solution: Generally, most people—particularly those who deal with turfgrass management and farming—consider earthworms to be beneficial as their feeding activity enriches the soil. In addition, their burrowing improves soil aeration. The soil they ingest with their food becomes a good source of natural fertilizer when excreted.

The problems they create—as you indicated—are mounds of soil in the turfgrass area which can be unsightly. In your situation, this presents an uneven soil surface for playing. Also, a large number of earthworms may be found crawling or dead on sidewalks, driveways, etc. during heavy rains or saturated soil conditions.

Although these activities can be a nuisance, or objectionable to a number of people, there is no pesticide registered to manage earthworms. Reports indicate that certain soil-applied insecticides on lawns may have some adverse effects on earthworm population and activity. If any of the readers have suggestions or comments, I will pass them on in this column.

Read and follow label specifications for better results.

Ever see an 'umbrella' tree?

Problem: Are you familiar with the "umbrella" tree? If so, do you have any idea where I can locate one? What is its botanical name? (Pennsylvania)

Solution: In reviewing the literature from our library, the specific name of the umbrella tree to which you are probably referring is the *Magnolia tripetala*. In addition to this, the following names of trees were also included under that umbrella tree name:

- Australian: *Brassaia actinophylla*
- Ear-leaved: *Magnolia frasseri*
- Queens: *Brassaia actinophylla*
- Queensland: *Brassaia actinophylla*
- Texas: *Melia azadarach*

Among the above names and tree species, the umbrella tree most commonly refers to umbrella magnolia (*Magnolia tripetala*). It gets its name from the characteristic arrangement of large leaves. Unlike many other plants on which the leaves are normally arranged along the branches, the umbrella tree's leaves are

crowded at the ends of the branches, giving an umbrella effect.

The umbrella magnolia tree can be a large shrub or small tree seldom more than 40 feet tall. It is found near streams or in moist soils along the coastal plain and Piedmont plateau from Virginia to Georgia. It may also be found in mountains.

The tree has large (10- to 20-inch) broad elongated leaves, cream-colored, 10- to 12-inch wide flowers with three sepals and six or nine petals with unpleasant odor and fruits which are rose/red-colored and two- to four-inches long. Its bark is light gray and smooth.

With the above unique characteristics, it may not be very difficult to locate the tree in its growing regions, which are Pennsylvania to Alabama and Mississippi.

Nutsedge control tips

Problem: We are having problems controlling nutsedge in our clients' properties. We have used Basagran with mixed results. Is there a better product or method of managing nutsedge on warm-season grasses? (Texas)

Solution: In Texas, you are probably dealing with two types of nutsedge—the yellow and purple varieties. Of the two, purple nutsedge is reportedly common in your area. The Basagran herbicide that you used is primarily for yellow nutsedge control. You would obtain mixed results if purple nutsedge is the predominant problem, since Basagran doesn't work well in managing this.

If purple nutsedge is predominant, try using Image herbicide. This herbicide is by far the best product for purple nutsedge management. The manufacturer claims 80- to 100 percent control.

It will also help control yellow nutsedge.

Image can be used on warm-season established turfgrasses like bermudagrass, centipedegrass, St. Augustinegrass and zoysia-grass. Labels say not to use on tall fescue or mixed stand of tall fescue and bermudagrass. For better results, apply Image on actively growing weeds. It can be tank mixed with other herbicides, but check the label specifications for mixing guidelines and compatibilities.

According to the label information, Image will also help manage quite a few other monocot and dicot weeds. Refer to the label for more information.

Image is a systemic herbicide which can move throughout the foliage and roots and starve weeds by affecting plant protein production. Reportedly, weed growth stops within two weeks of application. With continued mowing and good plant health care practices for desirable turfgrass, the weed problem disappears.

Read and follow label specifications for best results.

Dr. Balakrishna Rao is Manager of Research and Technical Development for the Davey Tree Co., Kent, Ohio.

Mail 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.

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LANDSCAPE MANAGEMENT

Do you know the mowing basics?

The turf type, the mower, the operator: all play vital roles in maintaining healthy grass.

■ "Mowing is the primary cultural practice in turfgrass management," observes Dr. Beth Baikan of Cornell University. And as such, it should be the number one consideration of turfgrass managers who want a healthy, attractive stand of turf.

She defines mowing as: "removal of photosynthetically active tissue that temporarily reduces the food-making process and weakens the plant."

In one sentence: if you're not mowing correctly, chances are that you're creating more problems for yourself.

Mowing height, Baikan says, is determined by:

- turfgrass species;
- intensity of maintenance; and
- how the turf is being used.

"All species have a mowing tolerance range," she says. Bermudagrass should be mowed at 0.2-0.5 inches; St. Augustine, carpetgrass, centipedegrass at 1.5-2 inches; turf-type tall fescue and bahiagrass at 2-3 inches.

"The shorter the grass is mowed, the more frequently it needs to be mowed," Baikan further observes. "You can compromise mowing height and frequency on less highly-maintained turf, but not on intensely-maintained turf like golf greens."

Also, grasses which grow in shade typically lack vigor; its leaves are weaker than grasses growing in sunlight. So mowing heights should be raised 30-50 percent of the normal recommended height.

Other factors—"Selection of equipment is critical," she says.

"And adjustment of blades is also important."

She suggests adjusting the mower blades before every mowing.

Rotary blades cut in a horizontal mode, reel blades in a circular mode. Rotary blades use a suction-effect to stand the grass up straight and then rip the tip of the plant off in a scythe-like manner. Reel blades, on the other hand, use a cleaner, more efficient scissors-type action with the blade slicing off the turfgrass tips against the bedknife.

"Season, time and temperature also play an important role in mowing practices," Baikan notes.

In cool, wet periods, you should use a higher cut to promote deep rooting. When it's hot and dry, a shorter cut means less water evapotranspiration loss. "You have to see where the line is," she says.

Problems—Common problems which arise from improper mowing practices include:

- 1) At lower heights, the plant is stressed more, meaning more opportunity for weed encroachment.
- 2) Dull blades will rip the plant, causing injury.
- 3) When the mower is travelling at an excessive forward speed, the turf tends to show a wavy appearance.

4) Mower bounce on unlevel ground contributes to an inconsistent cut.

5) An improperly-set deck could result in scalping, which is removing an excessive amount of leaf tissue. Baikan and other turf experts recommend setting the deck so that not more than 1/3 of the leaf tissue is removed. "Scalped grass is more susceptible to pests and turf," she says.

6) Mowing stressed grass just places more stress on the plants, resulting in a bevy of problems.

7) Mowing frosted grass removes needed moisture from the plant's access.

8) Improperly maintained mowing equipment contributes to turf damage by leaking gas, oil and hydraulic fluids.

9) An excessive accumulation of clippings results in an unhealthy appearance when it dries up. She suggests collecting clippings when they show an excessive accumulation, or mowing more frequently.

10) Continually mowing in the same direction causes formation of a "grain." "You can create a pattern of beauty just by cutting in different directions," she says.

—Jerry Roche

ATHLETIC FIELD MOWING HEIGHTS

USE

In-season

Off-season

Bowling, cricket

1/4"-1/3"

1/4"-1/3"

Field hockey

3/4"-1 1/2"

2"-2 1/2"

Baseball outfield

1"-1 1/2"

2"-2 1/2"

Soccer

1"-1 1/2"

2"-2 1/2"

Rugby, lacrosse

1 1/2"-2"

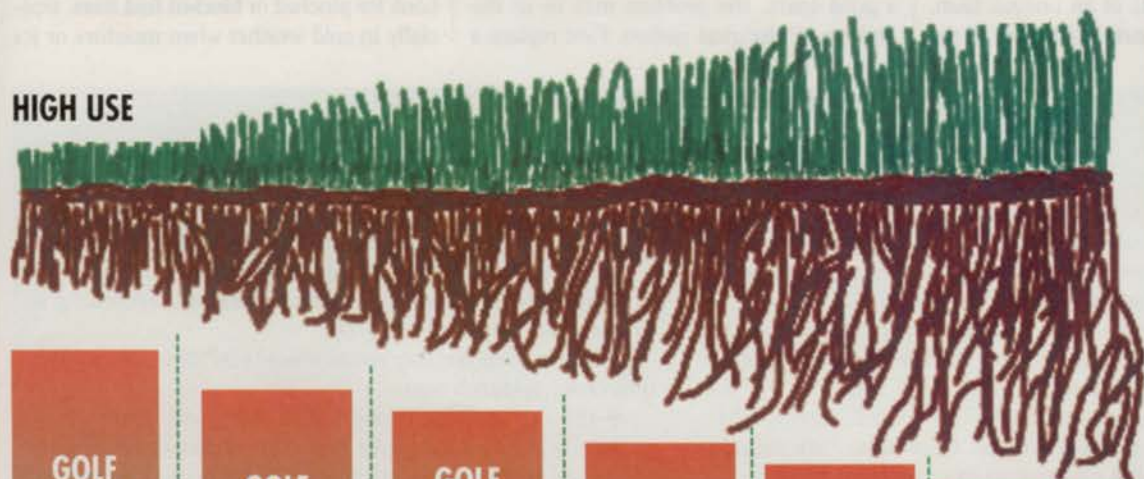
2 1/2"-3"

Source: Beth Baikan

CULTURAL INTENSITY

LOW USE

HIGH USE



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short,
smooth
true rolls

GOLF TEES
minimize
grass
interference

GOLF FAIRWAYS
longer for
playability,
bounce and
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ATHLETIC FIELDS
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footing and
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HOME LAWNS:
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UTILITY TURF:
longer heights
for infrequent
mowing, avoids
scalping



Beth Baikan:
tip number one is
mow at the proper
height.



Troubleshooting mower engines

Here are some typical mowing problems, and how you can solve them.

by Robert L. Tracinski

■ While most landscape managers probably don't think of themselves as mechanics, even the best in the business are only as good as their equipment.

By learning to recognize and correct routine mower problems quickly and efficiently, you can devote more time to the productive work.

Here are some common problems and how to get to their roots, with the key points in boldface type.

Striping, unevenness—Uneven cutting, skipped areas or poor performance indicates a problem with the mower deck or cutting blade.

Wet grass may be more prone to uneven cutting than drier turf. If possible, wait until the grass is dry before cutting. It's also possible that you're trying to do the job too fast. A **slower ground speed** may solve the problem. Also, cutting too much grass at one time often results in an uneven lawn. Try taking **less of a cut**— $1\frac{1}{2}$ inches at the

most. If the grass you're cutting is exceptionally fine, it might help to go to a **lower lift blade**.

If the problem is in the mower, you most likely have a **dull blade**. Keep the blade sharp; corners should not be rounded.

Keep the underside of the **mowing deck clean**, and inspect it to make sure that it isn't **warped or distorted**. Make sure you don't have a **bent or damaged toe guard** at the discharge chute.

If you're using a belt drive model, be sure that the **belt is properly tensioned** and that the **idler moves freely**.

Engine won't start—A variety of factors, from weather changes to worn parts, can contribute to hard starting.

Determine whether you're **getting a spark**. Using insulated metal pliers, remove the spark plug and touch the threaded area of the plug to a metal surface on the engine. Turn over the engine and look for a blue spark.

Electrical problems—If you don't have a good spark, the problem may be in the ignition or electrical system. First **replace a**

worn or corroded spark plug.

Next, check the **battery's electrolyte levels**, add water if necessary, and **clean the terminals**. Have the battery tested if you're still having problems.

Sometimes a problem elsewhere in the system may cause the battery to run down. Among the possibilities:

- accessories are left on after the vehicle is turned off, draining the battery;
- the vehicle has been idle for three months or more, during which time the battery has deteriorated;
- battery cables or connections are heavily corroded, leading to voltage seepage.

Fuel problems—Be sure you're using fresh fuel with an **alcohol content of less than 10 percent**, and the **right blend** for the season. Summer-grade fuel can be less volatile in winter, while winter blends can cause vapor lock in warmer weather.

Another culprit may be the fuel system. Check fuel flow: **pulse lines should be connected** and the **fuel vent open and clear**. Look for pinched or **blocked fuel lines**, especially in cold weather when moisture or ice

Mulching: does it work?

■ Mark Prinster of TruGreen/ChemLawn believes that there will be a nationwide restriction on disposing of lawn debris in sanitary landfills by the mid-1990s.

Mulching grass clippings, he believes, could be a partial answer to the problem of disposal for landscape managers. But only a partial solution.

"Do mulching mowers work?" he asked, during the Georgia Turfgrass Conference last December. "We found, yes and no, depending on the type of grass."

The newer mowers with a mulching feature work well on common bermudagrass and tall fescue, but "on hybrid bermuda, the differences are not great enough to warrant use of a mulching mower," Prinster believes.

Mulching mowers were developed by Bolens in the 1960s, Prinster notes. They feature a dome-shaped deck, a special cutting blade and a powerful (4 to 5 hp) engine. The advantages of using mulching mowers:

- You return the clippings to the environment.
- You eliminate composting and dumping.
- You reduce mowing time by 38 percent, according to TruGreen/ChemLawn research.
- You reduce fertility requirements by 25 to 30 percent, university research says.
- You can mulch autumn leaves along with grass.

According to university research, grass clippings are composed of 4% nitrogen, 0.5% phosphorus, 2% potassium, 75-85% water and 20-30% protein. According to a study at Washington State University, mulched lawns were healthier than non-mulched lawns (see chart on page 14).

"The agronomic benefits of mulching are real," said Prinster. "The mulching mowers work, but they're not foolproof. We have to watch weeds because if you mulch you're returning the weed source to the turf."

— Jerry Roche

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Some manufacturers have established a 'hot line' service to get an answer in one call.

can form; keep the tank full in winter to prevent moisture condensation.

Fuel deterioration—Make sure the carburetor is clean, and compare the adjustments on your carburetor to the settings recommended in the operator's manual.

If you routinely store your mower for the winter or extended periods of time, **fuel can deteriorate**, turn to varnish and cause engine difficulty or damage. Before storing a vehicle for more than three months (less in warmer environments), it's best to remove all fuel from the system. If you must store a vehicle with fuel and without adding stabilizer, **replace the fuel and filter and remove and clean the carburetor** before use.

Oil consumption—If blue smoke blows from the exhaust during mowing, the engine is consuming too much oil.

If you suspect this, use the following checklist to identify the specific problem:

- **oil level** is too high: drain off the excess and keep an eye on it;
- **oil weight**: review the operator's manual for recommended weights;
- **oil foaming**: do not operate the engine above recommended speeds;
- **overheating**: refer to operator's manual for instructions on cleaning the cooling fins.

Hydrostatic transmission—If you have slow response from a hydrostatic transmission, steering difficulty or a slow deck lift speed, check the **oil level** according to the procedure outlined in the operator's manual. Check for moisture in the oil. Change the **oil filter** if you have problems with contamination, or if it has not been changed in the past season; if a **hydraulic filter is plugged** with debris, it will restrict oil flow. Fill the filter with the proper oil before installing it in the mower.

Help wanted—What if, despite your best efforts, you can't seem to locate or correct a mower problem? The next step may be to go to your dealer for help. Some manufacturers have established a "hotline" service which allows a dealer to call the manufacturer, describe a problem and get an answer in one phone call. In any case, your dealer should be able to help.

—Robert L. Tracinski is consumer information manager at Deere & Co., Raleigh, N.C.

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Coated fertilizers explained

Manufacturers rely on polymers to improve and, in some cases, eliminate sulfur coating.

■ Turfgrass managers—and, increasingly, homeowners, too—are embracing the use of coated fertilizers.

"Coated fertilizers represent the fastest growing segment in controlled-release technology," says Harvey M. Goertz of O.M. Scott & Sons. From 1980-1990 sales of coated fertilizers grew 10 percent annually, while sales of all controlled-release fertilizers grew at a rate of 4 percent.

All of this has taken place since the Tennessee Valley Authority developed sulfur coated urea (SCU) in the 1970s. Heated granules of urea are passed through molten sulfur. Sulfur is used because of its nutrient value and its low cost.

But because sulfur eventually shrinks and cracks, the granule is also often treated with a wax sealant. Finally, the granules receive a flow conditioner to keep them from sticking together or gumming up equipment.

"One of the reasons why SCU is used as opposed to other types of controlled-release nitrogen—no matter who makes it—is that it's the most cost-effective, slow-release nitrogen source on the market today," says Dr. Bruce Augustin of Lesco.

Better release—SCU releases nitrogen at a steadier and more prolonged rate than

does urea because its coating partially prevents water from reaching the prill, decreasing the likelihood of surges in turfgrass growth and of "burns." More importantly, the turfgrass stays greener longer.

The nitrogen escapes into the soil through imperfections in the sulfur coating. The release rate is affected by coating thickness and quality, and, in the case of SCUs with a wax sealant, temperature also. Microbes must attack the sealant to uncover cracks in the granule.

SCU has some drawbacks. Particles with too light a coating can break and release their nutrient too soon. SCU is a statistical blend of many different coating weights

and qualities. This minimizes the effects of particles receiving too light or too heavy coatings.

More precise—Manufacturers say that polymer technology gives them more precise and uniform coating capabilities. Also, by using a polymer, the sulfur coating can be reduced.

"Polymer-coated fertilizer provide a higher degree of controlled release," says John Detrick of Pursell Industries. "It's much more predictable, even after lots of mechanical jostling."

Polymer-coated fertilizers aren't new. They've been around since the late 1950s, says Augustin. But today's products have only become widely available to turfgrass managers in the last two years.

Several major manufacturers market polymer-coated, controlled-release fertiliz-

ers with similar names: Polyon by Pursell Industries, Poly-Plus by Lesco, and Poly-S by O.M. Scotts. Grace Sierra's turfgrass product is known as Once, and Cedar Chemical has its Multicote (technically, resin coated).

Although similar in purpose, there are differences in these products.

Some differences—Pursell, for instance, uses its patented reactive layers coating (RLC) process—two co-reactive liquids polymerized to form ultra-thin coatings over a nutrient, usually urea. Detrick says the nutrient release rate, via osmosis, can be programmed by the coating thickness. Polyon is a nutrient (urea) core surrounded by polyurethane.

By contrast, both Lesco's Poly-Plus and Scotts' Poly-S fertilizers have both sulfur, for economics, and polymer coatings.

Grace Sierra and Cedar Chemicals apply oil-based resins to coat several different fertilizer substrates. For instance, Cedar's Multicote is coated potassium nitrate.

Coated fertilizers are often manufactured to specific granule sizes and coating thicknesses for specific uses:

✓ **Standard:** lawn care, homeowner, nurseries

✓ **Mini-granules:** lawn care, golf courses

✓ **Micro-granules:** golf greens

By increasing the thickness of the polymer coating, a manufacturer can produce (and probably already has) coated fertilizers that release nutrients for over a year or more. There are practical reasons, including the cost of polymers, why this isn't practical. Besides, how much fertilizer does anyone want to put down in a single application to give the turf its four or five pounds of nitrogen a year?

For a faster green-up, coated fertilizers are often sold in blends with uncoated, more readily available forms of nutrients.

—Ron Hall

Advantages of polymer-coated fertilizers:

- More consistent nutrient release rate.
- Higher N levels available because of thinner coating.
- Less breakage during handling cutting down on premature release and dust.
- More complete release of nutrient.
- Wide range of product sizes, release rates, nutrients.

For more information:

Cedar Chemical Corp.
5100 Poplar Ave Ste 2414
Memphis, TN 38137
Circle No. 300 on Reader Inquiry Card

Grace Sierra
1001 Yosemite Drive
Milpitas, CA 95035
Circle No. 301 on Reader Inquiry Card

Lesco, Inc.
20005 Lake Road
Rocky River, OH 44107
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O.M. Scott & Sons Company
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environmental stewardship and reduce their chemical costs.



Everett Mealman
Chairman and
Chief Executive Officer
PBI/Gordon Corporation

The environmental age weed control program being used by Roger Albrecht is typical of progressive turf professionals.

Albrecht is president of Nitro-Green Corporation, which has 38 lawn care franchisees scattered over 15 different states, and he manages two locations in California for his own hands-on experience.

"Our goal is to eliminate all broadcast spraying of herbicides on the ornamental turf we manage, and replace it with spot treatment as necessary," says Albrecht. "We want to be proactive on environmental issues and be able to assure our customers that we are using the absolute minimum requirement of chemicals."

Albrecht goes on to explain that such a program takes time to implement because

the turf needs to be so healthy and thick that weeds cannot easily germinate.

"The elimination of the broadcast applications of pre-emergent herbicides is the critical step," says Albrecht, "because, no matter what, some crabgrass is going to appear, and since crabgrass is a major cause of complaints, we must be able to eliminate it fast with no discoloration."

Trimec Plus provides the safety net that enables Albrecht to eventually eliminate broadcast applications of pre-emergent herbicides. "We have absolute confidence in Trimec Plus to handle any crabgrass or nutsedge that shows up," says Albrecht.

And, of course, the same spot sprayer filled with Trimec Plus that Albrecht uses to control crabgrass and nutsedge also controls the other grassy and broadleaf weeds that can germinate throughout the year. "Having one herbicide for all of our spot treatments is a major factor in our program," says Albrecht.

But if Trimec Plus is ideal for spot treatments, it is also unsurpassed for broadcast applications when the need exists. Listen to George Toma, the executive turf consultant for the Royals, Chiefs, and NFL:

"My son, Chip, the groundskeeper for the Truman Sports Complex, used broadcast applications of Trimec Plus on the out-of-sight, unirrigated perimeters of the complex which was loaded with every conceivable weed, and Trimec Plus

absolutely took out everything except the bluegrass."

According to Toma, it would have taken four different selective herbicides to do the job that Trimec Plus was able to do . . . but even more important, Toma says that Trimec Plus did a better job on all of the individual species than a narrow spectrum selective could have done.

Now also approved for use in zoysia and tall fescue

Trimec Plus is a unique formulation of Trimec Broadleaf Herbicide and MSMA in a stable, uniform suspension that is as easy to work with as any other Trimec Complex.

And now it is labeled for use in turf-type tall fescues and zoysiagrass, as well as established bluegrass and bermudagrass.

So, by all means, give Trimec Plus a trial this season . . . especially on crabgrass, nutsedge and clover. We assure you that your experience with Trimec Plus will give you the confidence you need to start working toward the elimination of broadcasting.



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HERBICIDE 771-293

Circle No. 131 on Reader Inquiry Card

Word to the wise:

Watch out for OSHA citations

OSHA Act of 1970, updated in 1991, has clout in green industry.

■ "OSHA people are not the kind of people you want to get mad," says Mary Malotke of TechneTrain, Milford, Ohio.

Pursuant to the Occupational Safety and Health Administration's (OSHA) regulations, small businesses must maintain a safe working place, especially those places that use hazardous substances like pesticides and hazardous equipment like lawn mowers.

Small businesses are subject to unannounced inspections by OSHA teams, and with the inspections could come citations for violations of the rules. The Hazard Communication and Worker Right-to-Know rules are contained in the first part of an OSHA inspection, Malotke notes.

She says that the most common OSHA citations are:

- 1) no written program
- 2) no employee training
- 3) no MSDSs for the chemicals on premises.
- 4) no in-plant container labels
- 5) MSDS file not up to date
- 6) no chemical inventory
- 7) no written chemical hazard determination (program)

Written programs—The key elements to a written program, the most common OSHA violation in the green industry, are:

- what you are and what you do;

- key work areas and their managers;

- the name of the person responsible for the list of chemicals and MSDS file;

- the person responsible for reviewing MSDSs and chemical lists;

- what training includes;

- who handles training;

- how new hazards are assessed; and

- protective and emergency equipment available.

Training programs—Training programs, the second-most common OSHA violation, should include:

- information on the Right-to-Know laws and your company's program;

- basic information on the chemicals and their physical hazards;

- how to read an MSDS and pesticide label;

- where MSDSs and the written program are kept;

- where special hazards are located; and

- protective and emergency plans and procedures.

Facility requirements—Malotke also says that each facility must:

- list chemicals and where they're kept;

- label all containers;

- train employees in safe handling procedures; and

- create a safe work environment with safety/protective equipment.

OSHA representatives can help you with questions, but if you ask them to your place of business, they are bound by law to cite any violations they might see.

—Jerry Roche

Hazardous substances checklist

■ If your small business deals with pesticides or other hazardous substances, the Occupational Safety and Health Administration dictates that you follow certain rules in handling and applying any such materials.

The rules were established by the OSHA Act of 1970 to help prevent accidents in the workplace, and thus provide for the continuing safety of your employees.

The OSHA, in its publication 2209, issued a list of checkpoints for small businesses in their handling of hazardous substances. Here is that list:

- Are employees trained in the safe handling of hazardous chemicals?
- Are employees aware of the potential hazards involving various chemicals?
- Is employee exposure to chemicals kept within acceptable levels?
- Are eye wash fountains and safety showers provided in areas where the chemicals are handled?
- Are all containers labeled for their contents?
- Are all employees required to use personal protective clothing and equipment when handling chemicals?
- Are flammable or toxic chemicals kept in closed containers when not in use?
- Is the contents of chemical piping systems clearly marked?
- Is adequate means readily available for neutralizing or disposing of spills?

continued on page 22



Are employees trained in the safe handling of hazardous chemicals?



Mary Malotke: written program is number one citation.

Government a great resource

■ The federal government's main reference for information on OSHA is:

"OSHA Handbook for Small Businesses," Pub. 2209. It is available for \$4.00 from the U.S. Government Printing Office, Supt. of Documents, Washington, DC 20402; phone (202) 738-3238.

To order "Job Safety and Health Protection" (the OSHA workplace poster), the OSHA recordkeeping requirements, a copy of the appropriate sets of standards, and other publications, contact your local OSHA Area Office. There are 85 such offices in the U.S. and its possessions.

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Always read and follow label directions carefully.
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Circle No. 109 on Reader Inquiry Card

CHECKLIST from page 18

- Have standard operating procedures been established for spills?
- Where needed for emergency use, are respirators stored in a convenient, clean and sanitary location?
- Are employees prohibited from eating in areas where hazardous chemicals are present?
- Is personal protective equipment provided, used and maintained?
- Are there standard operating procedures for the selection and use of respirators?
- Are employees instructed in the correct use of respirators, and are the respirators NIOSH-approved?
- Do you have a medical or biological monitoring system?
- Are you familiar with the Threshold Limit Values or Permissible Exposure Limits of airborne contaminants?

- Do employees complain about dizziness, headaches, nausea, irritation, or other factors of discomfort when using chemicals?
- Is there a dermatitis problem?
- Have you considered using an industrial hygienist or environmental health specialist to evaluate your operation?
- Is there a list of hazardous substances used in your workplace?
- Is there a written hazard communication program dealing with Material Safety Data Sheets (MSDSs), labeling and employee training?
- Is each hazardous substance container labeled with product identity and a hazard warning?
- Is there a MSDS readily available for each hazardous substance?
- Is there an employee training program for hazardous substances?

Surviving crises in the workplace

by Ed Wandtke

■ Most of us are aware of the feelings and emotions we experience when being told a family member has died, or have received a call to go to a hospital because an injured friend is being rushed there.

When a crisis occurs, all other concerns come to a sudden halt.

With changing technology, a smarter workforce and more dependence on high technology, we have become dependent on technological innovations. The price for technological advancements may be an increased opportunity for a crisis.

Learning how to plan for, and deal with, crises often helps to simplify the crisis when it occurs. You, as an owner/manager, can take several steps to make crises easier to deal with:

1) Plan for the unexpected. You might deal with unexpected problems each day: a sudden weather change, a sick technician, a truck accident. All of these situations can cause a crisis, but if you have advance contingency plans, you will find these crises are only inconveniences. For example, having an extra truck available and an extra technician for the busy season is a good way to ensure that work gets done.

2) Recognize emotion when it impacts you on the job. We often pretend that emotions don't influence us in our business actions, especially in this male-dominated green industry. But when a crisis does occur at work, emotions really come into full view. Don't let these emotions take over and rule your actions.

Remember, you need to remain as objective and as understanding as possible.

3) Recognize the supporting cast. When the company successfully survives a crisis, sometimes the managers get most of the credit. But if your company is faced with hard times, your employees are the ones who often pick up the slack and pull it through. Giving your employees the recognition they deserve is a sign of a company that knows the true value of an employee.

4) Handle change with flexible employees. It is amazing how well we can deal with change. When weather influ-

Employees can be a source of strength when the company goes through an unfortunate and/or unexpected turn of events.

ences a planned activity on a given day, we are forced to change the schedule. Most companies have learned to deal with change, and many owners even put extra stress on their companies when they change their minds from morning to evening. Make sure, as owner, that you strive to be consistent. Employees are asked to deal with enough change, so owners should be the stability they can count on.

5) Don't create your own crises. One aspect of most businesses is the need for

secrets and confidential information. "Who knows what" is often a very disconcerting situation among employees. If someone is being fired and someone else finds out in advance, distrust is provoked. Employees like to know where they stand in order to feel in control of their own destinies.

6) Keep your goals in aim. Often, a crisis will cause many employees to suddenly rush to solve a new and unusual problem. Who then takes command to refocus the employees back on goals? In many companies I have seen too much time wasted on activities that will not increase profitability or goal achievement. Many companies, however, have found that using an industry-experienced consultant to be effective. The tips and suggestions you receive from such an individual can help you dispose of useless activities and help keep you and your employees focused.

Crisis, though infrequent, can be a real trial. Learning how to deal with a crisis, having an individual ready to back up your positions, and knowing when to seek outside help can make crisis resolution easier.

Remember, crises usually happen when you think you have every base covered. Advance planning and knowing where to get assistance will help your make it through whatever might arise and make your company more resilient.

—Ed Wandtke is a principle in Wandtke & Associates, 2586 Oakstone Dr., Columbus, OH 43231. For further information about the items covered in this article, phone (614) 891-3111.

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Chipper/shredder safety precautions

'It can't happen to me,' you say? Chipper/shredder accidents do happen to landscape and tree care specialists who don't follow these rules.

by James E. Guyette

■ Chippers and shredders come in a number of sizes and configurations, ranging from homeowner models to commercial pull-behinds, but one factor is constant: the need for the ultimate in safety precautions.

Larger chippers made for tree branch disposal can be especially dangerous to careless operators or others in the immediate area.

Most chipper accidents are caused by operator negligence or error, not because of the machine's design. They happen to experienced, confident operators who have a lapse in paying attention to what they're doing—perhaps caught up in the belief that "it can't happen to me."

Actual chipper injury figures are not available, but the risks are real.

Aside from the obvious mayhem of coming into contact with high-speed rotating blades, an operator can be stuck by a stick knocked askew from the hopper. Or an operator working along a roadside can be run over by a passing vehicle. And the chips coming from the chute have enough force to peel the paint off a house.

Industry sources say that more than half of all chipper injuries are suffered during maintenance procedures.

Always let the moving parts come to a full stop and then remove the ignition key before beginning any maintenance, says John Such, field sales representative for Lanphear Supply in South Euclid, Ohio. He stresses that operators should read all the manuals and be thoroughly trained before working on these machines.

Safety tips—Wearing the proper attire is crucial. Loose clothes or too-tight gloves (always avoid the gauntlet-type) can catch on brush going into the blades. A hard hat and eye and ear protection is mandatory. And the noise level means that an operator has to take special note visually of sur-

rounding people and activities.

When setting up, make sure you're not parked under the tree being worked on. (People have actually done this.) Block the wheels, taking care to keep your feet out from under the tongue mechanism. Many accidents happen during the hooking and unhooking process.

Before hauling, the safety chains should be crossed under the trailer tongue and securely fastened so the chipper will not fall to the ground should there be a hitch failure.

Check the chute discharge direction, and don't stand in front of it.

Look in the hopper before starting. This prevents shovels, water coolers or whatever from being fed into the blades.

When feeding, never let your hands cross the plane of the hopper, and *never* use a hand, foot or rake to push items in. Don't force items in, and avoid feeding metal, glass, stones and any other foreign matter. Be certain that a climbing rope isn't still entangled in a branch.

Smooth running—Certain periodic,

Such: PTO can 'turn blue and fry.'



weekly and daily inspections and maintenance tasks are necessary for equipment upkeep and safety.

For example, on engines with external governors, Such says that a frequent belt inspection is absolutely required. If there's the slightest question about that belt, replace it immediately.

"If the governor belt breaks, the machine will run out of control," Such warns.

The knives should be checked daily for sharpness, and they should all be the same length. The chipper belts require daily inspection, as do the fluid levels, air cleaner, lights, hitch and pintel ring. Make sure there's no dirt on the radiator. If there is,



Hard hats, goggles and gloves are required safety gear for chipper/shredder operators.

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the machine can overheat.

When checking belts, make sure you don't over-tighten them. This can cause bearing, pump and/or PTO failure. The PTO/clutch should be checked daily. It should take about 90 ft./lbs. of force to engage the clutch handle.

Don't turn blue—The major cause of PTO failure is "facing burn-out" from either incorrect use, incorrect adjustment or a combination. "It will turn blue and you'll fry it," says Such, who recently conducted a seminar on chipper use for the Ohio Chapter of the International Society of Arboriculture.

The engagement time for the PTO and the adjustments must meet the manufacturer's specs to avoid costly breakdowns.

Lubricate the bearing properly. One manufacturer reports that 95 percent of all bearing failures are caused by improper lubrication. Another big cause of bearing failure is operating when the grease is cold. This will ruin the shaft along with the bearing. Such says that it is absolutely crucial that the correct specified warm-up and idle periods be followed. Heed the manufacturer's specs and don't try for short cuts.

Do/don't

DO:

- ✓ Understand safety, maintenance materials
- ✓ Wear head, eye, hearing protection
- ✓ Be extra observant
- ✓ Set up far from road
- ✓ Use cones, signs and a flagger
- ✓ Feed from the right side or rear of hopper
- ✓ Check discharge chute direction
- ✓ Look in the hopper first
- ✓ Look for climbing ropes in branches
- ✓ Check governor belt often
- ✓ Specified daily, weekly, periodic inspections
- ✓ Keep radiator clean
- ✓ Check PTO
- ✓ Follow PTO specs
- ✓ Follow specified warm-up period
- ✓ Lubricate bearings correctly

DON'T:

- ✓ Wear clothes that are too loose
- ✓ Wear gloves that are too tight
- ✓ Set up under targeted tree
- ✓ Run toward road
- ✓ Let branches flip into road
- ✓ Stand in front of discharge chute
- ✓ Set non-brush items in hopper
- ✓ Let hands cross hopper plane
- ✓ Use hand, foot, rake, etc. to push brush in
- ✓ Force anything in
- ✓ Push in foreign items
- ✓ Use dull knives
- ✓ Ignore any part of the machine
- ✓ Over-tighten belts
- ✓ Try any short cuts

When an inspection timetable is presented, it's there for good reason. It does no harm to check each part—be it bolt, screw, filter, fluid—as often as possible.

"Common sense, reading all safety instructions and a good maintenance

program are the keys to chipper safety and a trouble-free chipper," says Such.

—James E. Guyette is a freelance writer specializing in the green industry. He is based in South Euclid, Ohio.

Questions to ask before spraying

■ Dr. Stephen Pearson, technical services manager at Spraying Systems Co., Wheaton, Ill., encourages pesticide and fertilizer applicators to consider drift potential before spraying. Here are five questions you should ask yourself:

1) Are there sensitive plants nearby? Allot extra buffer zones on the border of the application zone.

2) What size spray tip is being used? Larger, heavier droplets from larger nozzles or special drift control spray tips minimize drift.

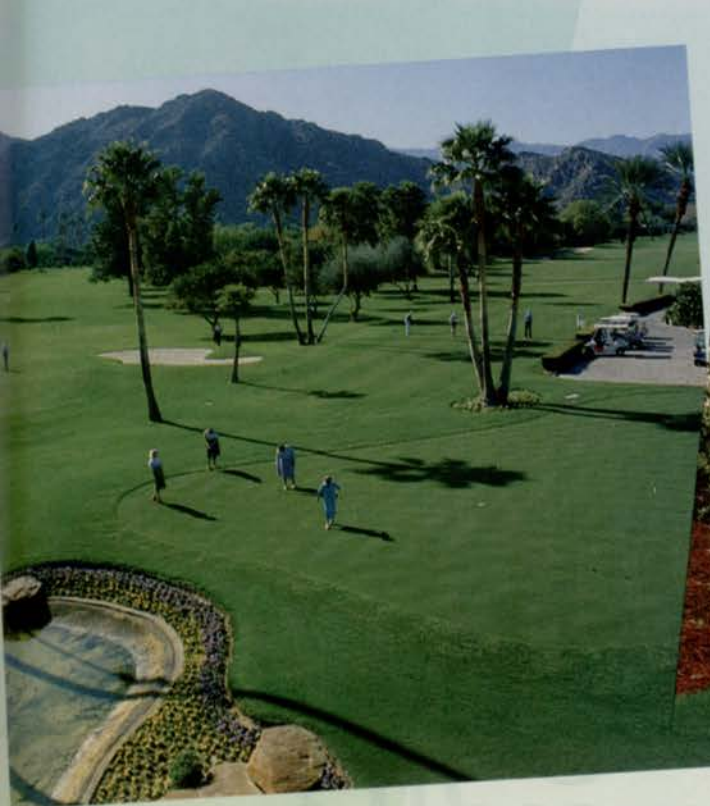
3) From what height is the product being applied? Higher booms mean droplets have more time to drift before hitting the target.

4) What is the wind velocity? Even a slight breeze of 6 mph can cause measurable drift.

5) What is the spray pressure? If an applicator reduced the pressure, drift is reduced through increased droplet size. But remember, decreasing the spray pressure too much can affect spray pattern and volume. Always re-calibrate sprayers after a significant change in pressure.



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**NOTHING RUNS
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Dealing with expectations of athletic field quality

The groundskeeper must listen to views from many sources and focus on the issues, not the emotions.

by Jesse Cuevas

■ Everyone involved with an athletic field wants a major league field on a minor league budget.

The number one concern—first, last and always—is a safe facility. The second concern is fairness. If the field is instrumental in a win-or-lose situation, the groundskeeper hasn't done his job.

Initial fund-raising for field renovation often is driven by the project's excitement and the expectations of the entire community, school system or professional sports organization.

But getting a yearly financial commitment for proper field maintenance is a

tougher proposition. The "money people" will need to be convinced from the beginning that field care is an ongoing need.

Projected annual maintenance budgets should be brought to the table when field renovation is first discussed. Costs should be broken out into categories for equipment, parts and repair, fertilizer, seed and chemicals, irrigation, other supplies, and labor. The groundskeeper must have the courage to present this case, fully detailed and documented.

Then, teamwork—Once a decision to repair a field is made, designate a person to take the steps necessary to keep it up. Whoever holds this position will be an integral part of the team, and should be treated as such. That bond should be encouraged and reinforced—even at facilities where the pay scale is low. Little things, like a team hat and jacket, can symbolize the team concept.

Field maintenance expectations start at the top. It's vital that the administration or athletic department provide positive support. The head coach and field maintenance supervisor must have a mutual respect. The players will take their cue from the coach.

Top level personnel, removed from the day-to-day activity of field maintenance, are reactive to pressures from their superiors and funding entities. These people mostly want answers.

Toward these people, the groundskeeper must listen to the views expressed and focus on the issues, not the emotions. Most coaches and players have good-sized egos. If the game is going well, it's largely due to their ability. If the game is going poorly, there must be other con-

tributing factors—and the field is a likely candidate.

It's here that the groundskeeper must be thick-skinned. Only about two percent of the comments he gets on the field will be compliments. The groundskeeper must be able to listen to complaints without acting defensive. Let the complainer express his or her concern—vent some anger if necessary—and then allow a cooling off period.

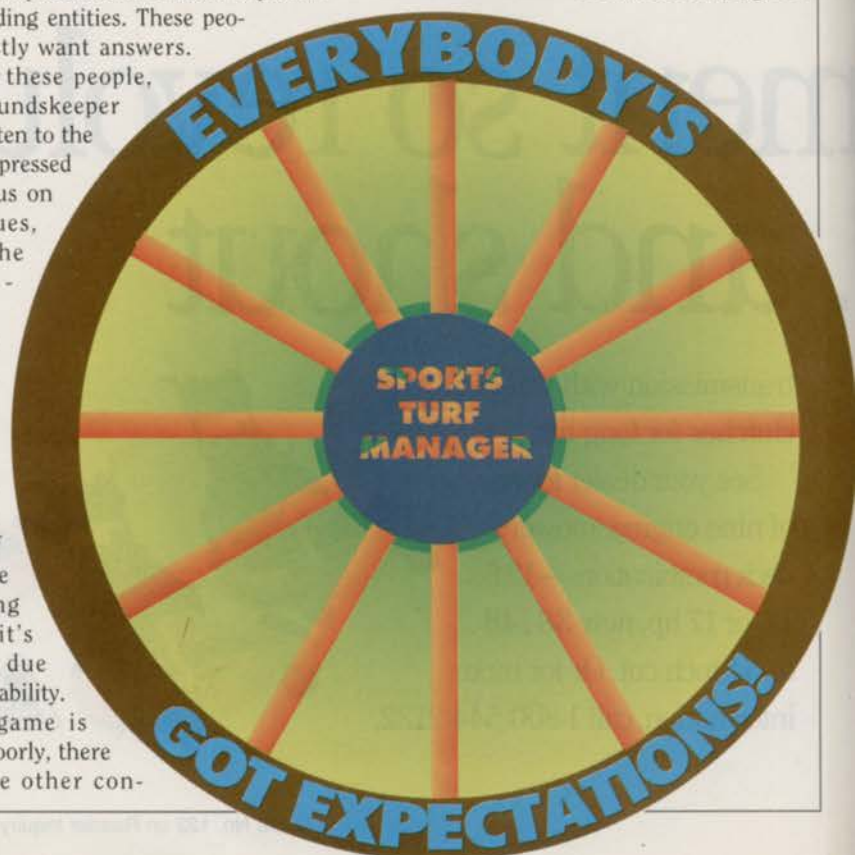
An investigation comes next. If something is wrong, the groundskeeper must take responsibility to get it fixed. If the field is in proper condition, the complaint can be chalked up to the emotions of the game.

Players' parents can be the groundskeeper's biggest help, or greatest detriment. Some might want to help (see list). Those who only want to criticize can wreck team morale. Some of the best volunteers are found in the smaller towns where the ballfield is their pride and joy. These people are hungry for advice and more than willing to follow the maintenance program laid out for them.

Dollars and sense—Dollars will always be an issue. Only so many dollars are available, and that money has to be stretched to cover total field needs. To do that, turf maintenance knowledge is essential.

If the groundskeeper doesn't have formal training in field management, there

continued on page 34





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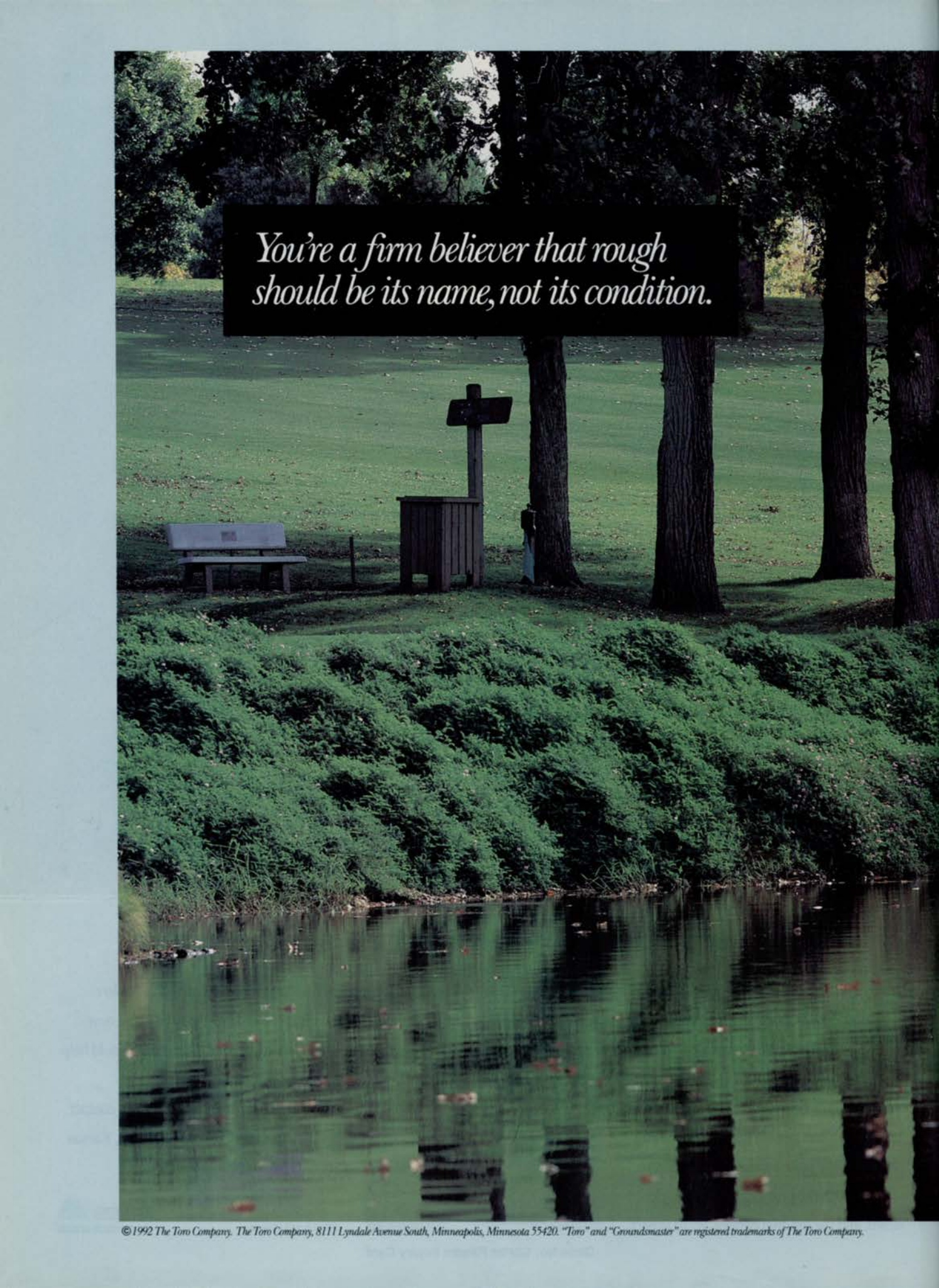
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A photograph of a golf course. In the foreground, a calm pond reflects the surrounding greenery. A dense line of ferns and bushes runs along the edge of the water. In the middle ground, a wooden bench sits on a grassy area. To the right of the bench is a wooden signpost with a cross-shaped top and a small wooden structure at its base. Several large, mature trees stand in the background, their shadows cast on the grass. The overall atmosphere is peaceful and well-maintained.

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Extreme maneuverability means increased productivity with superb quality of cut.*



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Volunteer jobs

Members of the community, whether they be coaches, players, players' parents or just interested spectators, can be used to help maintain fields. Some of the jobs they willingly accept are:

- ☞ raking
- ☞ dragging
- ☞ laying sod
- ☞ cleaning up
- ☞ fence mending
- ☞ painting
- ☞ fund-raising



The sports turf manager's skill can create field conditions that allow players to concentrate solely on the game and their part in it.

QUALITY from page 30

are many sources of help: university extension agents, sports turf consultants, state and local turf organizations, and professional associations.

The Sports Turf Managers Association (STMA) and its regional chapters offer excellent hands-on events for the major aspects of field care. Members readily share their own expertise with other members.

Over the last 10 to 15 years, safety and the quality of playing conditions have

improved drastically. Equipment has been modified for greater player protection. Weight training and nutrition programs have been incorporated into athletic programs at the high school and college levels. Field quality may be the last factor to be addressed, but it has reached the attention of the public.

The groundskeeper has the opportunity to pull together the entire program. By listening to everyone's expectations, he or she can develop a plan to deliver the best facili-

ty for the least cost. The athletic field manager can then make sure that wheel is rolling steadily forward, with a sturdy set of spokes supporting it all the way.

—Jesse Cuevas is stadium superintendent of Johnny Rosenblatt Stadium, Omaha, Neb., home of the Class AAA Omaha Royals and the College World Series. He is a board member of the national Sports Turf Managers Association.

Save time, make money

Mowing equipment tips from Mike Kail, founder and owner of Lawn Rangers, Inc., a full-service mowing/maintenance company in Indianapolis:

☞ If you have an open mind for mowing equipment and techniques, you can improve your profitability.

☞ If you're using walk-behinds, as your company grows, Kail suggests you consider switching to mid-size riding mowers.

"Years ago, when we first started our operation, the mid-size walk-behind mowers (36- to 52-inch deck) were—and still are—quite popular. But it takes a man to run every one." Kail says labor needs have changed in such a way to require more companies to do the same or more with

fewer employees. Stricter time management requires that he now use the mid-size riding mower. It's easier to maneuver and covers more ground faster.

"A mid-size rider (48- to 61-inch deck) will replace two walk-behinds and one man," says Kail.

☞ Mulching mowers are essential; Kail says the time you save by leaving the clippings is considerable. Tell your customers: *clippings don't cause thatch!*

☞ Select an equipment dealer who will work with you, from sale to maintenance. "If you have a good dealer who keeps you mowing, keeps you making money, that's the key."



Kail: find a dealer who'll keep you making money.

Survey shows customers want and need more information on organic programs

The big challenges to an organic lawn care business are customer education and straight talk about results.

■ Organic lawn care programs take time. First there's the time it takes before an organic program shows results on a client's lawn.

Then comes customer education: customers should know what they're getting for their money.

Brent Flory, president of Freedom Lawns, Delphi, Ind., is tackling both challenges at once. As a man with a background in agriculture, he continues to experiment to find the best agronomic approach for each individual lawn problem. As a businessman, he strives to educate his customers about the difference between chemical and—as he describes it—"pesticide-free" applications.

Like any good fact-finder, Flory recently surveyed a majority of his customer base to learn for himself how they rate the service he offers at Freedom Lawns. He hopes to share his findings with others interested in the natural lawn care market, but for now, he's working on his own learning curve.

"I'm satisfied there is a very useful place for organic lawn care at this time," says Flory. "I am also convinced we need much more research."

Partners—Flory's goal is a "partnership" with his customers, one founded on customer awareness and approval of organic lawn care.

The biggest challenge he faces is in the area of terminology. According to his survey, 68 percent of those surveyed consider a pesticide to be something that

only eradicates insects; 21 percent call a pesticide an environmental hazard.

"Most people do not understand the term, 'pesticide,'" says Flory. "This tells me that the industry is not properly informing the public about what pesticides are. Only three percent considered a pesticide to include a weed-killer. As a result, I must use terms such as 'chemical-free' rather than 'pesticide-free.'"

When asked about the most desirable benefit of the Freedom Lawns service, 68 percent cited the chemical-free feature. Twenty-one percent were more appreciative of a healthy lawn, and eight percent listed three benefits: chemical free, safety and a healthy lawn.

"Several indicated they were pleased," says Flory. "After several years of chemical lawn care, they are now seeing much improvement in their lawns with our organic program."

But how does it look?—One customer "summed it up," says Flory. "He said our chemical-free ideas would not be a fair sacrifice if the lawn did not look good. The environment was important to him, but, the package was a benefit only because of pleasing results."

"We can say 'organic' all we want," says Flory, "but without a pretty lawn, what's the benefit?" Other findings included:

- ✓ 22 percent felt the company's techniques needed improvement;
- ✓ 17 percent said they would like more information on organics;
- ✓ 96 percent read the newsletter;
- ✓ more than half the clients surveyed said they're satisfied with service as is.

Flory says the majority of those surveyed prefer direct discussion and recommendations over videos. Several appreciate being given product labels, something Flory suspects is missing from most lawn



Flory: Without a pretty lawn, what's the benefit to the customer?

care companies.

"I have many opportunities to view invoices from other lawn companies," says Flory, and they are often vague as to what materials are being applied. I firmly believe that most homeowners should become informed about what they are buying and how much."

A 1992 Roper/Gallup survey revealed that 57 percent of those surveyed favored environmental restrictions; 80 percent said economic growth and environmental protection were not incompatible goals, but if forced to choose, 59 percent would put the environment first. Results like that convince Flory that there is still a lot of interest in environmental issues.

"Whether we agree with it or not," he says, "we need to become more concerned about the environment since the majority of people place more importance on it than ever before."

—Terry McIver

IN THIS ISSUE

Nematode efficacy studied in Scottsdale
The importance of scouting in IPM programs
Predator insects as biological controls

Nematode progress reviewed by company, turf research experts

SCOTTSDALE, Ariz.—Representatives of the Biosys Co. and Ciba-Geigy met here in March with leading university turfgrass entomologists to discuss the future of the Exhibit nematode product for use in professional turf care.

The 14 university and USDA researchers included Drs. Harry Niemczyk, David Shetlar and Michael Klein from Ohio State University; Dr. Patricia Cobb, Auburn University; Dr. Patricia Vittum, University of Massachusetts; and Dr. Lee Hellman, of the University of Maryland.

The Palo Alto, Calif.-based Biosys has established itself as a leader in nematode research and breeding. It recently entered into a joint marketing agreement with Ciba-Geigy Corp. and at least two other major chemical firms.

Currently, Exhibit controls cutworms, armyworms, sod webworms and billbugs.

The two-day meeting, meant to help drum up support for the product and to keep track of field research progress, contained a summary by Dr. Ramon Georgis of the current nematode research on soil insects in turf, including:

- ✓ black cutworms;
- ✓ sod webworms;
- ✓ billbugs;
- ✓ armyworms;
- ✓ chinch bugs;



Houseworth: new packaging designed for easier measure.

- ✓ mole crickets;
- ✓ white grubs;
- ✓ crane flies.

The only significant surface-feeding turf pest not yet included on the Exhibit label is the chinch bug, and it was suggested that various research strategies be used to tackle the problem of chinch bug control.

One of the recognized drawbacks with nematode control is its delayed action following application. To overcome this problem on golf courses, Niemczyk, Shetlar and Stan Swier of New Hampshire are going to develop a research program to judge the efficacy of season long applications on golf course turf.

The group approved the introduction of a bulk LCO product based on *S.*

glaseri and/or *H. bacteriophora* for control of white grubs, and another, based on *S. scapterisci*, for control of mole crickets.

Nematode formulations currently under development by Biosys include:

- a filled-flowable nematode formulation in a paper pouch supported by cardboard;
- a gel formulation in a bag, in which an insert is broken and the nematodes become flowable;
- a moist granular flowable that dissolves in the mixing tank;
- a granular formulation that absorbs water, and then breaks open to disperse the nematodes.

Exhibit will soon be available in a new flowable formulation, consisting of plastic polymer pouches attached to a plastic frame.

Rick Miller of Biosys says new Exhibit use recommendations have been established, primarily a significant relaxation of product use barriers, including time of day and pre-irrigation requirement, a reduced screen size requirement and adoption of turf spray volume standards.

Future nematode application research will cover the following:

- investigation of the effects of thatch and soil moisture;
- control evaluation/insect monitoring techniques;

- further work on irrigation requirements and automated delivery systems;
- sub-surface application systems.

continued on next page



Klein: Questions nematode efficacy in white grub control.



Georgis: Exhibit available in bulk for LCOs.



Miller: Exhibit 'The consumer white grub product of the future.'

NEMATODE Q & A

■ Here are the answers to green industry professionals' most common questions about nematodes.

What are nematodes?—They're a large class of worm-like organisms that live in soil and occupy many different biological niches. Some are destructive parasites of plants. Others—called beneficial nematodes—prey exclusively on grubs and larvae of harmful insects.

What are the practical uses of nematodes?—Nematodes are an ideal biopesticide (or, a living organism that controls pests).

How do nematodes control insect pests?—Harmless to humans, animals and plants, beneficial nematodes aggressively pursue insects. When they sense the temperature and carbon dioxide emissions of soil-borne insects, beneficial nematodes move toward their prey and enter the pest through its body openings.

Are nematodes safe?—Beneficial nematodes are harmless to humans, pests and livestock, as well as honey bees, earthworms, ladybugs and other useful organisms. Nematodes represent a "closed system." This means that neither the nematodes nor their accompanying bacteria can live at the warm body temperature of mammals.

Are there any environmental side effects?—No. Beneficial nematodes do not have any negative impact on groundwater, soil, livestock, crops or farm workers. Nor do they become a permanent part of an agricultural or garden ecosystem. Even under ideal conditions, they persist in the soil only for a few months until they run out of prey.

How do nematodes compare to other biological pesticides?—Nematodes do not rely on passive ingestion or contact with the insect pest. They are mobile predators that actively seek out pests. They target a broad range of soil-living insects, at several stages of their life cycles.

What application rates are most effective?—User rates vary, according to the target pest, soil conditions and other factors. Generally, nematode-based pesticides are comparable in applied quantity to chemical sprays. For example, to treat an acre of turf, a grower would apply Exhibit (manufactured by Biosys, marketed by Ciba-Geigy) at the rate of four gallons per 50 to 100-gallons of water.

Suitable targets for steinernema nematodes

Insect group	Market segments
White grubs	turf, ornamentals, vegetables
Root weevils	turf, ornamentals, flowers, cranberries, citrus, banana, mint
Moths/caterpillars	turf, ornamentals, cranberries, artichokes, corn, peanut, vegetables
Root beetles	corn, vegetables, peanuts
Maggots, flies	mushrooms, pasture
Leaf miners	chrysanthemums, vegetables
Stem-borers	trees and shrubs
Cockroaches, yellowjackets	urban environments

courtesy Biosys

Nematodes, continued

A major stumbling block in nematode research is its control of white grubs in commercial turf applications. The product is currently marketed to consumer markets, but its control is not at the 80-85 percent control expected in professional applications.

According to Klein, the nematode was successful against white grubs in research conducted in the mid-1980's. Research conducted later research was not as positive, likely due to inferior quality nematodes, says Klein.

Pat Vittum, entomologist from the University of Massachusetts reports good results from her 1992 research. Her turf plots did not include a buffer zones, and nematode contamination was detected in the check plots.

Other conference participants indi-



Robert Crocker of Texas A & M suggests multiple applications for chinch bugs.

cated similar problems with nematode contamination.

If nematodes are moving actively or passively into other treatment plots, is the population being reduced in treatments in comparison to nematode-contaminated controls.

Suggestions to solve the problem of poor grub control results include larger plot; and increased variance due to uneven population distributions within plots.

Fred Baxendale, in research conducted at the University of Nebraska in 1992, found an 80 percent grub reduction with *S. glaseri*, 36 percent with Exhibit and 79 percent with Dursban.

Dr. Stan Swier of New Hampshire observed a 50 percent reduction with *S. glaseri*. The site contained heavy thatch, and rain occurred during application. No irrigation was applied during the study period.

A similar conference was scheduled for April, in Chicago. The topic: nematode use on ornamentals.

Research finds predatory insects valuable players in IPM strategy

COLLEGE PARK, MD—Are homeowners going to extremes in the quest for an insect-free garden? Dr. Michael Raupp of the University of Maryland thinks so, and he has the research to back it up.

Recent surveys conducted by the University of Maryland's Agricultural Experiment Station found that nine out of 10 Maryland homeowners use pesticides to rid their gardens of what they consider to be insect pests. But according to Raupp, a professor of entomology at the University of Maryland, College Park, as much as 95 percent of this pest control is unnecessary, and it is likely better to do nothing, so the beneficial predators can go to work.

The use of predator insects as a means of biological control is the center of Raupp's most recent research project, and it's a form of biological pest control he believes will be an important part of the future.



Raupp: Tests use "real world settings."

Most of the biological control research being done concerns food crops, but Raupp points out that the production of ornamental plants in greenhouses and nurseries is Maryland's largest agricultural crop industry.

Learning curve—There's still a lot left for researchers to uncover and learn about the predator insect control concept. According to Raupp, the interactions between predatory insects and their prey is virtually unknown for systems involving ornamental plants.

"A greater understanding of the potential and limitations of biological control will benefit virtually all of Maryland's citizens directly by reduced losses to pests," says Raupp, "and indirectly through reduced environmental contamination caused by unnecessary pesticide use when alternative controls, such as natural enemies, are available."

Raupp's study is a part of the Maryland

Agricultural Experiment Station's Integrated Pest Management program—a program that uses multiple techniques—with the emphasis on cultural strategies—to combat pests in the most efficient manner.

"A vital component absent from current landscape and nursery IPM programs is classical biological control," Raupp says. "My research provides a foundation for incorporating classical biological control into IPM programs for landscape plants and nurseries in Maryland."

One of the predators currently studied by Raupp and two graduate assistants is the Korean ladybug, *Chilocorus kuwanae*. Raupp and his assistants hope to determine which pests are most vulnerable to the ladybug, and how quickly it can establish control over those pests in a natural setting.

The bug's a natural—The ladybug is a natural enemy of the *Euonymus scale*, an insect pest that attacks *Euonymus* plants, which are small trees and shrubs commonly found in the landscape.

Beyond its ability to thrive on the *Euonymus scale*, Raupp's research has found that the Korean ladybug can also survive on the San Jose scale, a pest that attacks fruit trees and many types of common landscape plants.

According to Raupp, the Korean ladybug's palate favors the *Euonymus scale*, however, about 10 percent of the Korean ladybug population studied in research prefers the San Jose scale.

Raupp realizes the importance of field research when it comes to ultimate acceptance of a pest control strategy.

"For the classical biological approach to be accepted as a viable management option, its merit must be evaluated in 'real world' settings," says Raupp. In initial testing, he and his assistants released the Korean ladybug at a housing project in Baltimore and several government facilities in Washington, D.C. The first 50 ladybugs were released in 1990.

There are now several thousand at the

site. Many have migrated to plants on which they hadn't been released.

The bad news, says Raupp, is that the ladybug is not able to achieve

successful control when the pest population is high.

When the pest population is moderate to low, and environmental conditions are favorable, the ladybug appears to maintain scale populations below damaging levels.

One year after the study began, Raupp says he did observe a dramatic decline in pest populations at several locations where beetles were released. "However, at several sites nearby, where no ladybugs were present, scale populations also declined," says Raupp, who concludes that other factors such as bad weather were responsible for the pest reductions.

Questions remain—Raupp's research raises other biological control questions, such as which environmental factors favor pests, weaken plants and put predators at a disadvantage?

"The bottom line here is that we have to be careful," says Raupp. "Careful experimentation will help us avoid making premature recommendations concerning the use and efficacy of biological control agents such as ladybugs."

Some researchers believe that parasites, like wasps, which lay their eggs inside the pests, may be better at controlling pest populations than predators.

According to Raupp, another approach which will be tried soon combines parasites with predator control.

The Korean ladybug is a natural enemy of the *Euonymus scale*, which attacks the *Euonymus* plant, a favorite in many landscape designs.



A Korean ladybug feeds on *Euonymus scale*.

Scout client's property, get to know individual environment

■ "Personalized environmental management" is the lawn care of the future, says Glenn Bonick, owner and founder of Fertigrow, Dallas, Texas

As reported in a previous edition of *Bioturf News*, Bonick is one of those landscaping/lawn care professionals who offer natural or biological programs just in case a client requests it.

"What we're trying to do with IPM (Integrated Plant Management)," says Bonick, "is imitate what takes place in nature.

"By regularly scouting [each client's] property, we can get to know [each individual] environment.

Every yard is different and has different needs."

The Fertigrow program offers monitoring, inventory and diagnosis,

as well as diversified pest management and tree health treatment services. According to Bonick, scouting and monitoring guide all decisions in selecting the most suitable management strategy for each property.

Scouting and monitoring guide all management strategy decisions for each client's property.

Personal Plant Managers—Each of Fertigrow's IPM customers is assigned a Personal Plant Manager, whose job it is to scout a site to assess the insect, weed and disease presence.

Weather conditions are also tracked. Insects or disease are treated at the best time with the lowest possible impact on the environment. Natural defenses, such as beneficial insects, are used, and an evaluation of their efficacy is noted.

Bonick Landscaping was founded in 1982. The Fertigrow division was formed in 1987 to provide individual, environmentally conscious lawn, tree and shrub programs for those clients who may prefer to have a choice. Fertigrow also offers a basic low-impact program and an organic program in addition to its IPM service.

Biological controls to give supers more options and tougher turf

The most effective turf-grass control strategy is disease management, not pathogen elimination.

■ Disease management on the golf course turf is a concern of every superintendent.

The high level of management demanded by both golfer and superintendent is achieved through the use of naturally-occurring microorganisms to suppress disease development.

It is important to realize that diseases are an important component of the natural ecology and that the most effective control strategy is disease management, not pathogen elimination.

Turfgrass diseases are dynamic, and their development on golf courses will change as management practices are varied.

Biological management of disease is one area that will offer new approaches to the superintendent. This would include the use of resistance in grass plants and the

use of microorganisms.

The use of naturally-occurring microorganisms is an undeveloped resource in turfgrass. The goal of current research is to identify particular microorganisms that live naturally in the turfgrass ecosystem and which will control the activities of pathogens.

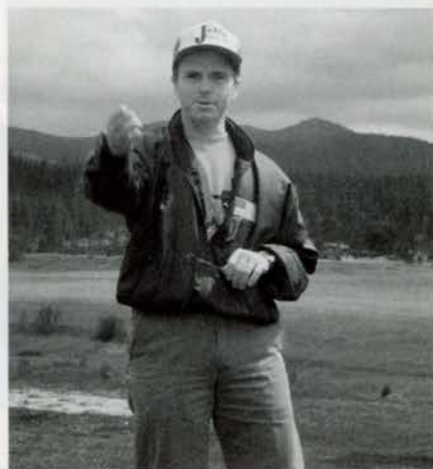
Once having identified these beneficial microorganisms, methods must be developed to insure that they are present in the turf.

At the University of Illinois, we have identified several microorganisms that have the specific ability

to inhibit the activities of *Pythium* and *Gaeumannomyces*-like fungi. These microorganisms can reduce the severity of disease. We are determining if they can be used with current golf course management practices.

We are also investigating if they can be integrated with the use of fungicides. The most exciting aspect of this research is the

The goal of current research is to identify particular microorganisms that live naturally in the turfgrass ecosystem and which will control the activities of pathogens.



Wilkinson: microbes reduce disease severity, will be used more for control.

use of genetic engineering to develop grass plants that not only resist pathogen attack, but also preferentially attract those beneficial microorganisms that will suppress pathogen activities.

—Dr. Hank Wilkinson, plant pathologist at the University of Illinois, Urbana-Champaign, presented during a talk at a Golf Course Superintendents of America meeting.

PRODUCTS

Thatch control made easier: product breaks down lignin layer

Thatch control might be the most talked-about turf problem, after insect/weed/disease control.

The layer of stems and roots that accumulates at the soil surface is one of the causes of weakened root systems and thinning turf.

A new product from Envirogenesis, called Thatch Biodigester, is reported to have shown good results in breaking down thatch through the action of naturally occurring organisms that improve the soil, increase turf disease resistance and restore the turf to a balanced ecosystem.

A key factor in the apparent success of Thatch Biodigester is its ability to reduce the concentrations of lignin, an aromatic polymer which surrounds woody tissue, and which makes up much of the composition of thatch.

According to Envirogenesis, most natural lignin is not degraded to the level of carbon dioxide but instead ends up as humic material. The lignin surrounding the outer layers of turfgrass tissue forms a barrier against microbial degradative enzymes.

Field trial—Envirogenesis recently reported positive results in thatch reduction in two field experiments; one was conducted at the University of California, Davis and a seven-month trial at Edgewood Tahoe Golf Course in Lake Tahoe, Nev.

Results showed higher population of microorganisms useful in thatch control, and better water movement.

According to Envirogenesis, field trials at Edgewood also support the concept that as the complex thatch organic substrates are metabolized and the water-soluble con-

stituents, cellulose and hemicelluloses disappear, the lignin content of the decaying residue rises. As a consequence, well-decomposed materials have a high percentage of lignin that can be measured in field trials.

Thatched turfs may become hydrophobic when dried, a condition that prevents water from reaching the soil.

Evidence suggests that the Thatch Bio Digester improves the water relationship to the soil atmosphere of thatched turfgrass through lignocellulosic conversion.

According to Envirogenesis, a report by Dr. James Beard in 1973 found that improved water relations will accelerate decomposition of thatch, and may also speed the remedy of localized dry spots.

Circle No. 205 on Reader Inquiry Card

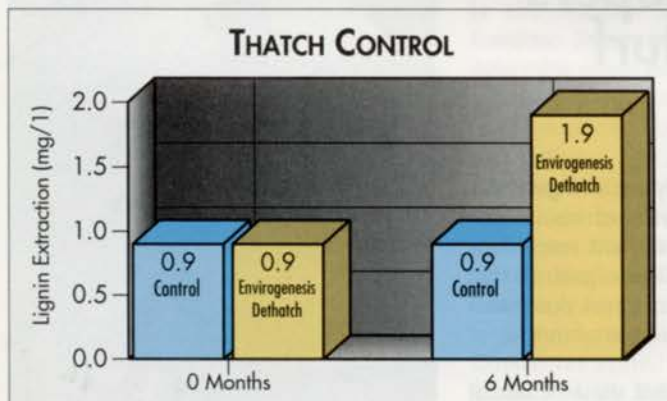


Fig. 1: Lignin content of decayed residue from core samples; Edgewood Golf Course trials, 1992.

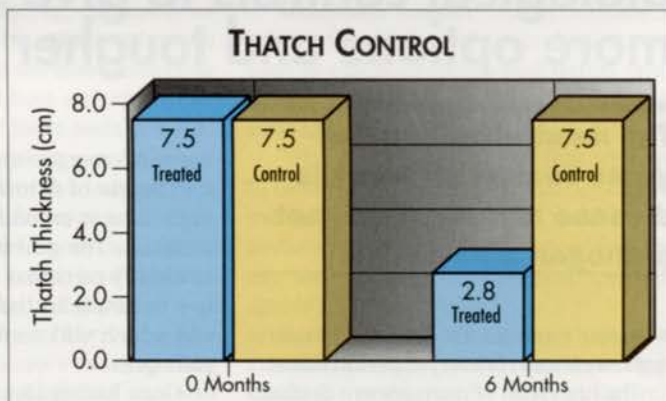


Fig. 2: Thatch thickness from core samples over time; Edgewood Golf Course Trials, 1992.

Carbon-rich blend provides energy for microorganisms

Growth Products, Ltd. has released Essential, an organic matter management product for the professional turf manager.

A liquid solution, Essential is described as a totally natural, organic solution, composed of a unique blend of carbon rich materials, each selected to provide all the various stages of organic decomposition of natural matter.

Essential supplies quick decomposers and more complex forms that require a longer breakdown period, and assist in the

process of soil rejuvenation.

Growth Products says Essential is designed to provide an energy source

for microorganisms, and plant nutrition with simple and complex sugars, enzymes, amino acids and natural organic chelates.

Product nutrients are absorbed through leaf and root tissue to improve plant physiology.

Growth Products says Essential is 100 percent soluble and can be mixed with N-P-K fertilizers and other technical products, for either foliar application or soil injection.

Essential is packaged in quart, gallon,



2-1/2 gal. and drum quantities.

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PRODUCTS

New inoculant jump-starts compost, produces humus

Enviromate Compost Inoculant, by Chr. Hansen's Biosystems, is a scientific combination of selected microbials, enzymes and nutrients designed to initiate and control the natural composting process. Hansen's says the product initiates and promotes a more controlled process, and produces a rich, uniform humus.

The bacteria in Enviromate—*Bacillus megaterium*, *Bacillus licheniformis*, and *Bacillus subtilis*—are a mixture of mesophiles and thermophiles. Mesophiles grow and metabolize well at medium temperatures; thermophiles do well at higher temperatures. Hansen's says these types of bacteria are the most effective decomposers in the composting process.

The guaranteed levels of highly active enzymes in Enviromate—cellulase and pectinase—assist in the rapid breakdown of plant cell walls and other hard-to-decompose organic material.

Cellulase breaks down plant cellulose, or fiber. Pectinase dissolves, pectin, which is a component of the plant cell wall.

Circle No. 207 on Reader Inquiry Card

Fertilizer eliminates product waste, adds to turf color

The Milorganite Marketing Division has introduced Milorganite Greens Grade fertilizer, primarily for use by golf course superintendents or persons in charge of highly-managed turf areas.

Alan K. Nees, Milorganite director of marketing, says the product was developed after much demand from superintendents.

"They want a dependable product that can be applied at virtually any time of the year and on any type of turfgrass, and yield the kind of results that the golfer will notice," says Nees.

The product is the same analysis as the company's regular grade Milorganite.

The size of the granule will be produced in very tight dimension specifications, eliminating waste caused when fertilizer is picked up by grass catchers. According to the company, the fertilizer granules' uniform sizing will result in an even and sustained release of nutrients.

Circle No. 208 on Reader Inquiry Card

Customized soil blending for golf course, sports turf uses

NorthWoods Organics is an affiliate company of Greensmix, a turf industry leader in customized soil blending. The company provides high quality, custom-processed organics for golf course and sports turf construction.

NorthWoods says its expertise is a result of nearly two decades of applied research at the University of Minnesota and 50 years of construction retail and blending businesses.

Its products include all types of peat sphagnum moss, reed-sedge hypnum and peat humus and composts, processed to specification.

Northwoods says its specialty includes quality control in the area of sports turf organics.

NorthWoods welcomes questions regarding our organic products and their uses in all aspects of sports turf construction, renovation and maintenance.

The company is headquartered in Duluth, Minn.

Circle No. 209 on Reader Inquiry Card

Instrument monitors environs and records pest activity

The EnviroCaster is designed to monitor the environmental conditions when plant disease and pests become most active.

The computer driven system is completely automated, solar powered, and PC compatible.

Each EnviroCaster can hold up to six models per module, which allows the user to take preventative measures based on the data collected.

EnviroCaster, made by Neogen Corp., (headquartered in Lansing, Mich.), is designed to monitor:

- air temperature;
- relative humidity;
- degree days (four accumulators);
- soil temperature at two depths;
- wind speed and direction;
- soil moisture and dewpoint.

The unit records data every 15 minutes, for 24 hours each day.

Circle No. 210 on Reader Inquiry Card.

Handbook covers natural approach to landscapes

The Landscape Restoration Handbook is a joint publication of the United States Golf Association and the New York Audubon Society.

The handbook demonstrates how to use naturalization as an alternative to more intensive management of landscapes.

Published by Lewis, the book shows how to obtain a variety of benefits from natural landscaping or ecological restoration projects:

- water quality improvement;
- erosion control;
- low maintenance;
- chemical reduction;
- ecosystem and ecological community protection and plant and animal species diversity.

The book also provides a list of scientific and common plant names associated with ecological communities throughout the US.

Available from Lewis Publishers, Boca Raton, FL, by calling (800) 272-7737; or from USGA, (800) 336-4446.

BIOTURF NEWS

For professional landscapers, lawn care operators and golf course superintendents interested in learning more about organic turf care supplements to existing chemical control.

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BIOTURF NEWS



For the Latest Developments in Biological, Organic and Natural Turf Care!

With our October premier publication of *Bioturf News*, we at *LANDSCAPE MANAGEMENT* magazine continued our commitment to give you the best possible coverage of green industry happenings.

Bioturf News is our new, bi-monthly review of current research and development in "biological, organic and natural" turf care. In 1993, it will exist independently of *LANDSCAPE MANAGEMENT*.

Some alternative turf care products can't be ignored.

Independent University research has determined them to be viable forms of insect, weed and disease control.

Many of our readers have also formed opinions of biological and

organic products.

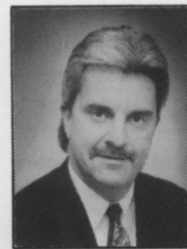
Some say biological and organic products are too expensive and take too long to show results.

Others believe customers should have a choice. And still others are probably wondering what all the excitement's about.

Our job, as an industry information source, is not to tell you what to think, but to simply relay the information to you—as soon as we can and in the best way possible—and let you take it from there.

There are two sides to every story. Your opinions count, and we want to know what you think of these products. Have you tried alternative turf care products? If so, what were the results?

To make *Bioturf News* the most useful green industry news source it can be, we will always welcome your questions and comments.



Jon Miducki
Publisher



Terry McIver
Editor



Bioturf News will be a bi-monthly newsletter reporting on biological, organic and natural products for the specialty turf market. But you have to subscribe in order to receive it. To receive your free, one-year subscription, please return the coupon below to:

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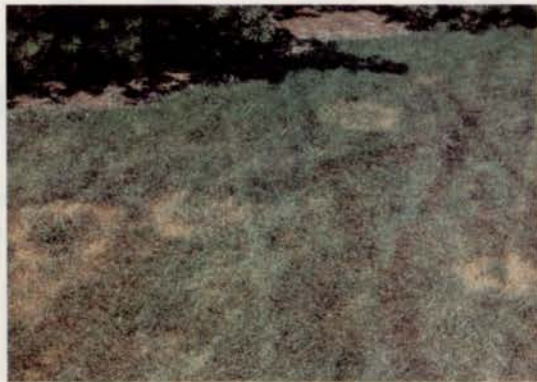


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brown patch
is one
disease
worsened
by poor
drainage.



Proper cultural practices prevent and manage diseases; fungicides are a management tool.

■ When designing a program to combat turfgrass diseases, it is important that the cool-season turf manager know the plant disease triangle—the three factors which determine susceptibility to disease.

For a disease to occur, these three conditions are necessary: a pathogen (agent that causes disease), a susceptible host (in this case, turfgrass), and favorable environmental conditions (cultural practices or weather factors that increase plant stress).

The pathogen—Dr. J.M. Vargas Jr. of Michigan State University, in his text "Management of Turfgrass Diseases," notes that five groups of organisms cause plant diseases: fungi, bacteria, viruses, nematodes and mycoplasma. In descending order, fungi, nematodes and viruses are the three most important causes of disease in turfgrass. The vast majority are caused by fungi.

The host—Different turfgrass cultivars and species are more susceptible to different turfgrass diseases. For example, Drs. W.H. Daniel and R.P. Freeborg, in their

"Turf Manager's Handbook," say that take-all patch primarily affects bentgrass and bluegrass while red thread primarily affects red fescues.

Susceptibility of the host many times depends on the amount of stress placed on the turf. Healthy, vigorous turf is less susceptible to disease. Stress can be caused by a variety of factors, including:

- Either inadequate or excessive nitrogen fertility.

Certain diseases like dollar spot, red thread, pink patch and rusts are more prevalent under low fertility. Diseases that are favored by high fertility include leaf spot, brown patch, pythium blight, stripe smut and the snow molds.

- Improper cultural practices, including mowing.

Grass should not be mowed shorter than its minimum competitive mowing height (see table). And no more than 1/3 of the leaf blade should be removed at any one mowing to minimize stress.

- Improper irrigation practices, improper drainage, excessive rainfall, excessive traffic, thatch build-up, soil pH and other abnormal conditions.

Environmental conditions—Temperature, water, atmospheric water vapor, light, soil and wind are the environmental conditions affecting the development of turf diseases, according to Dr. J.B. Beard.

Temperature is a major factor. Each pathogen has its range of optimal temperatures for development, which may or may not coincide with the optimal temperatures for growth and hardiness of the plant host. Dr. Beard, in his book "Turfgrass Science and Culture," notes that "the optimum temperature for development of a turf disease can range from as low as 35 to 40 degrees Fahrenheit to as high as 95 degrees."

Free water is needed to begin germination of most fungal spores. Also, water stresses or excesses can weaken the turfgrass plant and cause it to be more susceptible to the disease pathogen. Since watering turf in the late afternoon or early evening allows fungi to germinate, grow and infect all night, the best time to water is just before sunrise, according to Dr. Vargas.

"Good drainage is just as important as proper watering," Dr. Vargas continues. "Diseases made worse by poor drainage are pythium blight, rhizoctonia brown patch and gray leaf spot."

Cultural controls—According to Dr. Noel Jackson of the University of Rhode Island, cultural factors which may contribute to reducing the incidence of disease are:

- ✓ judicious changes in irrigation and fertilizer practice;

PROPER MOWING HEIGHTS

SPECIES	MIN. HEIGHT	PREFERRED HT.
Annual bluegrass	1/8"	1/4"-1"
Creeping bentgrass	1/8"	1/4"-1"
Fine fescue	1/2"	2"-3"
Kentucky bluegrass	3/4"	2"-3"
Tall fescue		2 1/2"-3 1/2"
Zoysiagrass	3/4"	2"-3"

Source: Dr. J.M. Vargas Jr.

- ✓ modification of soil pH;
- ✓ improvement of soil aeration and drainage;
- ✓ removal of thatch and clippings;
- ✓ adjustments in mowing height and mowing frequency;
- ✓ dew dispersal and improved air drainage;
- ✓ restraints on the amount of wear;
- ✓ incorporation of organic amendments;
- ✓ weed control;
- ✓ insect control;
- ✓ nematode control; and
- ✓ using resistant varieties of grass.

"But even the most skilled turf manager cannot rely entirely on cultural tactics to eliminate the risk of disease in high quality turf," Dr. Jackson admits.

Chemical controls—Turfgrass fungicides are either contact or systemic.

Contact fungicides are generally applied to the leaf and stem surfaces of turfgrasses, according to Dr. Peter Landschoot of Penn State University. Because they don't move appreciably within the plants, they may be washed or mowed off the plant surfaces and so are generally effective for only 7 to 14 days.

Contact fungicides are usually used to control foliar diseases and not root/crown diseases, Dr. Landschoot notes.

Systemic fungicides are absorbed and translocated within the plant, he adds. Systemics may protect the plants for a period of two to four weeks. "Most systemics will control both foliar and root/crown pathogens," he says, "but do not have as broad of a spectrum of control as contact fungicides."

There are many approaches to minimizing resistance of fungi to fungicides. Though some plant pathologists recommend mixing contact with systemic fungicides, Landschoot does not. "A more logical approach is to combine two or more systemic fungicides with different modes of action. Unfortunately, mixtures of systemics at full label rates are costly and may result in turf injury.

"Turf managers should take the threat of resistance seriously and avoid continuous and repeated use of fungicides with narrow modes of action."

Turf experts agree that the best way to control diseases of turfgrass is to use the proper cultural techniques as a preventive means, supplemented with the proper chemical controls to assist the management of a disease.

SOME TRADE NAMES OF TURF FUNGICIDES*

COMMON NAME	TRADE NAME	COMPANY
anilazine	Dyrene	Miles
benomyl	Tersan 1991	DuPont
chloroneb	Teremec	PBI-Gordon
	Terraneb	Kincaid
	Fungicide V	O.M. Scott
chloroneb/thiophan.-methyl	Fungicide IX	O.M. Scott
chlorothalonil	Daconil 2787	ISK Bio
	Thalonil	Terra
ethoprop	Mocap	Rhone-Poulenc
etridiazole	Terrazole	Uniroyal
fenamiphos	Nemacur	Miles
fenarimol	Rubigan	DowElanco
fenarimol/chlorothalonil	Broadway	DowElanco
iprodione	Chipco 26019	Rhone-Poulenc
	Fungicide X	O.M. Scott
maneb	Dithane	Rhone & Haas
mancozeb	Tersan LSR	DuPont
metalaxyl	Subdue	Ciba-Geigy
	Pythium Control	O.M. Scott
metalaxyl/mancozeb	Pace	Ciba-Geigy
pentachloronitrobenzene	Turficide	Uniroyal
propamocarb	Banol	Nor-Am
propiconazole	Banner	Ciba-Geigy
thiophanate-methyl	Cleary 3336	W.A. Cleary
	Fungo 50	Grace-Sierra
	Fungo 85	Grace-Sierra
	Systemic Fung.	O.M. Scott
thiophan.-methyl/iprodione	Fluid Fung.	O.M. Scott
triadimefon	Bayleton	Miles
	Fungicide VII	O.M. Scott
triadimefon/metalaxyl	Fluid Fung. II	O.M. Scott
thiram	Spotrete	W.A. Cleary
thiram/triadimefon	Fluid Fung. III	O.M. Scott
vinclozolin	Vorlan	Grace-Sierra
	Curalan	BASF
	Touché	Lesco

*Many fungicides are sold under trade names other than the ones listed. Check with your pesticide dealer for alternative products.

Sources: LM Buyer's Guide 1993;
Farm Chemicals Handbook, 1992

continued on page 40

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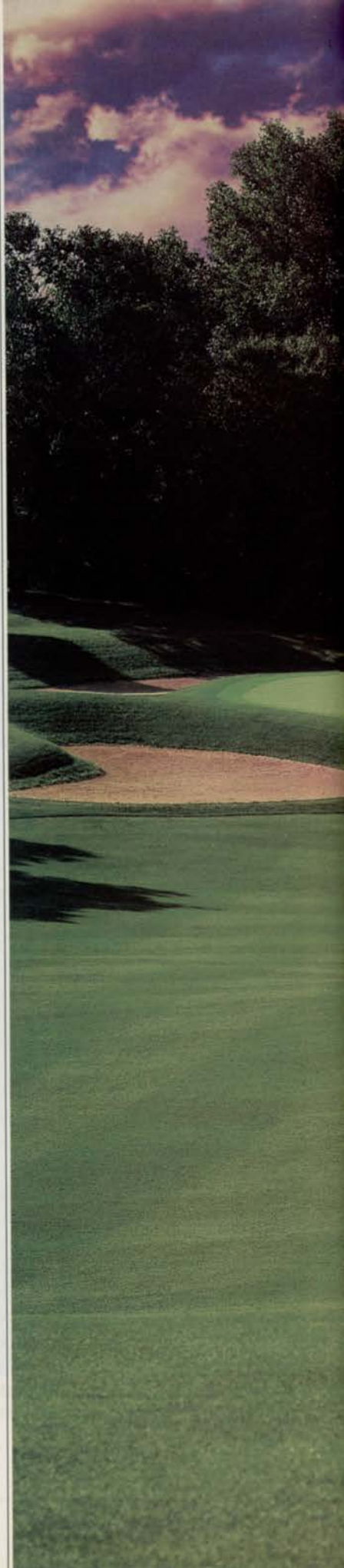
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COOL-SEASON TURF DISEASES

(Before using any pesticide, read and follow all label directions.)

DISEASE	SUSCEPTIBLE TURFGRASS	CULTURAL CONTROLS	CHEMICAL CONTROLS
algae	all turfgrasses	reduce shade avoid excessive fertilization improve soil drainage	mancozeb
anthracnose (<i>Colletotrichum graminicola</i>)	annual bluegrass bentgrass fine fescue	fertilize and water syringing may help minimize free water on leaves	benomyl ⁽¹⁾ , triadimefon, thiophanate-methyl ⁽¹⁾ , propiconazole, fenarimol, chlorothalonil
brown patch	(see rhizoctonia blight entry)		
dollar spot (<i>Lanzia and Moellerodiscus</i>)	all cool-season grasses	avoid N deficiency remove dew from greens choose resistant grasses	chlorothalonil, mancozeb, benomyl ⁽¹⁾ , anilazine ⁽¹⁾ , fenarimol, iprodione ⁽¹⁾ , spp.) propiconazole, thiophanate- methyl ⁽¹⁾ , thiram, tria- dimefon, vinclozolin ⁽¹⁾
fairy rings (<i>Basidiomycete</i> soil fungi)	all turfgrasses	replace infested sod & soil improve water penetration increase N fertilization	methyl bromide or for- maldehyde fumigation
fusarium blight (<i>Fusarium poae</i> , <i>F. vulmonum</i> , <i>F. crookwellense</i>)	bluegrasses bentgrasses fescues	light, infrequent watering do not cut blues or fescues under 2 inches reduce excessive thatch	triadimefon, fenarimol, benomyl ⁽¹⁾ , iprodione, thiophanate-methyl ⁽¹⁾
fusarium patch (pink snow mold) (<i>Fusarium nivale</i>)	bluegrasses bentgrasses fescues	avoid late fall fertilization rake leaves and cut short control drifting snow	triadimefon, benomyl ⁽¹⁾ , fenarimol, iprodione ⁽¹⁾ , mancozeb, mercury chlorides, pentachloro- nitrobenzene, thiram, thiophanate-methyl ⁽¹⁾ , vinclozolin
gray snow mold	(see typhula blight entry)		
leafspot/blight/ melting out (<i>Drechslera & Bipolaris</i> spp.)	Kentucky blue bentgrasses fine fescue ryegrasses	use resistant varieties raise cutting height avoid excessive N avoid light frequent watering	iprodione, anilazine, chlorothalonil, maneb, mancozeb, vinclozolin
nematodes	all turfgrasses	maintain growth with fer- tilization and irrigation	fenamiphos, ethoprop
necrotic ring spot (<i>Leptosphaeria korrae</i>)	Kentucky blue annual bluegrass ryegrasses fine fescue	avoid low mowing heights reduce excessive thatch use Kentucky blue, rye- grass mixtures maintain even soil moisture	fenarimol, propiconazole, vinclozolin, benomyl
pink patch (<i>Limonomyces roseipellis</i>)	bentgrass fine fescue perennial rye	balanced fertilization	vinclozolin, mancozeb,
pink snow mold	(see fusarium patch entry)		
powdery mildew (<i>Erysiphe graminis</i>)	Kentucky blue fine fescue	reduce shade increase air circulation by removing surround- ing vegetation use resistant varieties	triadimefon, fenarimol, propiconazole
pythium blight (<i>Pythium aphanidermatum</i> , <i>P. graminicola</i>)	bentgrasses annual bluegrass perennial rye Kentucky blue	improve soil drainage increase air circulation avoid mowing wet grass avoid excess watering	chloroneb, etridiazole, propamocarb, mancozeb, metalaxyl
red leaf spot (<i>Drechslera erythrospila</i>)	bentgrasses	remove clippings fertilize to maintain vigor	iprodione, anilazine
red thread (<i>Laetisaria luciformis</i>)	perennial rye fine fescue bentgrass annual bluegrass Kentucky blue	balanced fertility program	vinclozolin, cadmium, chlorothalonil, mancozeb, thiophanate-methyl, tria- dimefon, propiconazole
rhizoctonia blight (brown patch) (<i>Rhizoctonia solani</i> , <i>Thana- tophorus cucu- meris</i>)	bentgrass annual bluegrass tall fescue Kentucky blue fine fescue ryegrasses	avoid excessive nitrogen increase air circulation avoid excessive watering improve soil drainage	anilazine, chlorothalonil, mancozeb, benomyl ⁽¹⁾ , maneb, propiconazole, pentachloronitrobenzene, triadimefon, thiophan- ate-methyl ⁽¹⁾ , anilazine, iprodione, benomyl, vinclozolin
rust (<i>Puccinia</i> spp.)	perennial rye Kentucky blue	avoid nitrogen deficiency use resistant varieties promote growth with fer- tilization and irrigation	mancozeb, propiconazole, chlorothalonil, fenarimol, triadimefon
slime molds (<i>Myxomycete</i>)	all turfgrasses	remove by mowing, raking	zineb, mancozeb
snow mold	(see fusarium patch and typhula blight entries)		
stripe smut (<i>Ustilago striiformis</i>)	Kentucky blue bentgrasses	avoid drought stress avoid excessive nitrogen use resistant varieties	propiconazole, triadi- mefon, benomyl
summer patch (<i>Magnaporthe</i> spp.)	Kentucky blue	annual bluegrass reduce excessive thatch fine fescue	avoid low mowing height vinclozolin, propiconazole, light, frequent watering use slow-release nitrogen improve drainage
take-all patch (<i>Gaeumannomyces graminis</i> var. <i>avenae</i>)	bentgrass	avoid topdressing with pH greater than 6.0 avoid lime use ammonium chloride or ammonium sulfate fert.	benomyl
typhula blight (gray snow mold) (<i>Typhula</i> spp.)	bentgrass annual bluegrass Kentucky blue tall fescue perennial rye	avoid heavy fall nitrogen rake leaves and cut short control drifting snow	fenarimol, triadimefon, vinclozolin, propiconazole, benomyl
yellow patch (<i>Rhizoctonia cerealis</i>)	bentgrasses bluegrasses	reduce excessive thatch avoid excessive watering	fenarimol, triadimefon, vinclozolin, propiconazole, light, frequent watering use slow-release nitrogen improve drainage
yellow tuft (<i>Scierophthora</i> spp.)	bentgrass	improve drainage maintain adequate fertility	benomyl

(1) Continued or sole use of these materials may favor build-up of resistant fungal population.

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Circle No. 110 on Reader Inquiry Card

BASF

Diseases of warm-season turfgrasses

by Leon T. Lucas, Ph.D.
North Carolina State Univ.

■ Diseases of warm-season turfgrasses usually occur either in the spring and fall, or in the summer.

Spring dead spot—Spring dead spot and winter damage are the first problems observed in the spring in the northern range of adaptation of bermudagrass. Spring dead spot appears as circular dead spots from six inches to several feet in diameter in highly-maintained bermudagrass three to four years after planting. Winter damage and spring dead spot can be confused. However, winter damage usually occurs in large areas and is often associated with winter shade or north-facing slopes.

Several different fungi have been associated with spring dead spot.

Gaeumannomyces graminis causes a root and stolon rot during the fall and winter that results in circular dead spots in the spring. The bermudagrass grows over the spots slowly during the summer, and the spots are often invaded by weeds that also reduce the spread of the grass into the spots.

Lower levels of nitrogen and good aeration programs will help reduce the severity of this disease. Some research has indicated that ammonium-type nitrogen fertilizers with sufficient potassium will help reduce damage.

Once the disease is present, fungicides are not effective in the spring. Rubigan fungicide has a label for spring dead spot control; it should be applied in September or October to help control the disease the following spring.

Areas with spring dead spot in the spring should be mapped and treated with the fungicide in the fall.

Brown patch—Brown patch is usually seen in the spring during—or soon after—green-up, especially in cool-wet springs. It is caused by the fungus *Rhizoctonia solani*, and probably is the most serious disease of warm-season turfgrasses.

Symptoms are circular brown patches as large as 20 feet. Some live leaves usually remain in the patches. The infected shoots at the edge of the patches turn yellow and

are easily pulled from the stolons. Symptoms will be evident throughout the winter and the following spring. These patches may be the first to show symptoms of the disease becoming active the next spring.

Heavy fertilization with nitrogen and wetter environments increase the severity of brown patch. Moderate fertilization with nitrogen, proper irrigation, and good air circulation will help reduce the severity of brown patch. The grass should be irrigated enough to wet the soil 6 to 8 inches at one time and not irrigated again until several days later when drought symptoms become evident.

Removing trees, shrubs or fences can help manage this disease. Drying of the leaves can be increased by growing the grasses in more open areas with good sunlight and air circulation.

A number of fungicides are labelled for brown patch, but it has been difficult to control once symptoms become severe. Fungicides should be applied when early symptoms are seen or preventive fungicide applications may be needed where there is a history of brown patch. Fall applications may be best.

Fairy rings—Symptoms of fairy rings include green rings of grass, dead rings of grass, rings of mushrooms or puffballs, or a combination of signs.

The rings may be from several feet to hundreds of feet in diameter. They enlarge each year and often persist for many years.

Many different mushroom and puffball-type fungi are known to cause fairy rings.

Sources of organic matter such as stumps should be removed before planting. Once fairy rings are present, aeration and heavy irrigation may help to overcome turf damage. Renovation or soil fumigation can control fairy rings.

Some fungicides may help to control the rings. But control may not be warranted because of the expense and the fact that symptoms may be masked with fertilizer in some cases.

Leaf spot—*Helminthosporium* leaf spots are often a problem on bermudagrass and zoysia during wet weather in middle to late summer. The fungi that cause *Helminthosporium* are divided into three genera: *Bipolaris*, *Drechslera* or

Exserohilum. Symptoms vary by genera; they can range from brownish-black to light tan lesions on the leaves to crown and root rot.

Gray leaf spot, caused by *Pyricularia grisea*, occurs primarily on St. Augustinegrass. The disease begins as tiny brown lesions that enlarge to large tan lesions with purple to brown borders. The spots may be covered with a gray fungus during warm-moist weather. It is more severe in recently sprigged plantings.

Proper amounts of fertilizer and irrigation practices that reduce the length of leaf wetness periods will help reduce the damage from gray leaf spot. In extreme cases, fungicides can be used.

Pythium diseases—*Pythium* species cause crown and root rot diseases, usually in very wet soils. Most that are severe on cool-season grasses are not severe on warm-season grasses.

The best controls are good management practices and avoiding poorly drained soil. Some pythium-specific fungicides can be used.

Dollar spot—Dollar spot often occurs on bermudagrass, centipedegrass and zoysiagrass with low levels of fertility during late summer. Light tan leaf lesions with dark margins first appear on leaves. Small tan patches from 2 to 3 inches in diameter develop. The patches on zoysia may be darker and up to 6 inches in diameter. Applications of fertilizer with nitrogen will usually give adequate control; fungicides should not be needed.

Centipede decline—This complex may involve a number of factors: cold damage, soil pH, nutritional deficiencies, improper fertilization, herbicides, diseases and ground pearls among them.

Centipede grows best at a 5.5 pH; iron deficiency that causes the centipede to turn yellow and become weak often develops at higher pHs. Nutrients like sulfur and potassium should be used according to soil test results designed specifically for centipedegrass. Also, low levels of nitrogen (not more than 1 lb. N/1000 sq.ft./yr.) has helped to avoid the decline.

Some broadleaf weed herbicides have been associated with centipede decline. Label directions should be followed carefully.

continued on page 46

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fully. Diseases such as fairy rings and brown patch may contribute to the decline of centipedegrass. Where ground pearls are present, another type of turf, such as bermuda, may grow better.

Nematodes—The selection of the best adapted grasses and good management must be used to manage nematode damage. The few remaining nematicides are labelled only for golf course and commercial turf use, and not on residential lawns.

Good fertilization and irrigation programs will help overcome some nematode

damage. Some products that contain crab and shrimp shells may help control nematodes, as will incorporating organic matter in the soil at the time of planting and as topdressing.

Rusts—Rust diseases usually occur in late summer or fall. These diseases cause yellow to orange pustules. Zoysiagrasses are most severely damaged by rust, particularly in shaded areas without adequate fertilization.

This disease can be managed by using good turf management practices. Some of

the newer systemic fungicides have also given very good control.

St. Augustine decline—This disease is caused by a virus. The symptom resembles a nutrient deficiency or damage from some types of insects. The chlorosis slowly spreads until the infected lawn appears uniformly chlorotic and becomes thin. Entire lawns may be killed by this virus disease as early as three years after its first symptoms appear.

The best control is to use new varieties that are resistant to the virus.

DISEASE CONTROL, WARM-SEASON GRASSES

Disease	Fungicide, formulation	Oz./1000 sq.ft.	Interval/days
Brown patch	Banner 14.3%EC	2 to 4	10 to 21
	Bayleton 25WP	1 to 2	15 to 30
	Chipco 26019 50WP, 23.3%	1.5 to 2, 3 to 4	14 to 21
	Cleary's 3336 50WP	1 to 2	7 to 10
	Curalan DF	1 to 2 or 1.75 to 6.5	14 to 28
	Daconil 2787 F40.4%, 75WP, 90WDG	3 to 11 or 2 to 8	5 to 14
	Dusan 75WP	4 to 6	10 to 14
	Dyrene 4F	4 to 8	5 to 10
	Fore 80WP or Dithane M-45	4	5 to 14
	Fungo 50WP	2	7 to 14
	Proturf Fluid Fungicide 39.3F	1.3 to 2.6	7 to 14
	Rubigan AS	1.5	5 to 14
	Tersan 1991 50DF	2	7 to 10
	Two Some F	3 to 6	14 to 28
Touché F	1 to 2		
Centipede decline	None known effective		
Dollar spot	Banner 14.3%EC	0.5 to 2	7 to 28
	Bayleton 25WP	1 to 2	30 to 60
	Chipco 26019 50WP, Flo 23.3%	1.5 to 2, 3 to 4, 1.75 to 6.5	14 to 21
	Cleary's 3336 50WP	1 to 2	7 to 10
	Curalan DF	1 to 2	14 to 28
	Daconil 2787 F40.4%, 75WP or 90WDG	3 to 11, 2 to 8	7 to 14
	Dusan 75WP	3	5 to 14
	Fore 80WP or Dithane M-45	6 to 8	7 to 14
	Fungo 50WP	1 to 2	10 to 14
	Proturf Fluid Fungicide 39.3F	1.3 to 2.6	7 to 14
	Rubigan AS	0.75 to 1.5	10 to 28
	Tersan 1991 50DF	1	10 to 14
	Vorlan 50WP, Flo 41.3%	1 to 2	14 to 28
	Daconil 2787 F40.4%, 75WP, 90WDG	3 to 11	7 to 10
Banner 14.3%EC	2, 2 to 8, 1.75 to 6.5	14	
Leaf spots	Chipco 26019 50WP, Flo 23.2%	1.5 to 2, 4 to 8	14 to 21
	Daconil 2787 F40.4%, 75WP, 90WDG	3 to 11, 2 to 8	7 to 14
	Dusan 75WP	4 to 6	5 to 7
	Fore 80WP or Dithane M-45	4	7 to 14
	Manzate 200DF	3 to 4	7 to 12
	Proturf Fluid Fungicide 39.3F	1.3 to 2.6	7 to 14
	Tersan LSR 80WP	3 to 6	5 to 10
Rust	Banner 14.3%EC	1 to 2	14 to 28
	Bayleton 25WP	1 to 2	15 to 30
	Daconil 2787 F40.4%, 75WP, 90WDG	6 to 11, 4 to 8, 3.75 to 6.5	7 to 14
	Dusan 75WP	4 to 6	5 to 14
	Dyrene 4F	4 to 8	7 to 14
	Fore 80WP	4	7 to 14
	Tersan LSR 80WP	3 to 4	7 to 10
	Tersan 1991 50WP	6 to 8	Oct.-Nov.
Spring dead spot	Rubigan AS	4 to 6	Sept.-Nov.

Source: Dr. Leon T. Lucas, N.C. State Univ.

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Circle No. 116 on Reader Inquiry Card

STRICTLY GOLF

Drainage, chemical controls are the key, says Carolina Country Club super Bob Rogers.

■ Back in 1987, members at the Carolina Country Club could tee off almost any time, particularly during summer. Play dropped off dramatically as rainfall and sunshine took their annual toll on the course's aging bermuda/bentgrass greens.

"When the greens would start regressing, rounds would drop way off," says Bob Rogers, who became the course's superintendent that year. "The better players wouldn't even play here. They'd just go somewhere else."

Rogers says that it didn't take a scientist to recognize the thinning turf and slimy



Bob Rogers used fungicide applications to solve algae problems on his greens.

dark circles caused by algal scum, a key problem on the greens.

"I've often joked that many golfers can't distinguish between one strain of grass and another," he says, "but everyone knows the difference between grass and dirt."

The deteriorating condition of the club's aging greens led to a dramatic renovation of the 92-year-old course.

Working from a design by course architect John LaFoy, Rogers rebuilt the aging greens to updated specifications, using a sand/peat/topsoil mixture of 83:12:5, instead of a typical 90:10 or 80:20 mix.

"The new greens perc at 14.5 inches per hour," Rogers says, adding that the five percent topsoil component improves cation exchange capacity and reduced nutrient leaching.

The improved percolation rates are a major help in coping with the longstanding

continued on page 50

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Circle No. 113 on Reader Inquiry Card

ROGERS, from page 48

algal scum problem, Rogers says.

"On our old greens, we had perc rates as low as 0.1 inches per hour. So, under periods of heavy rainfall, together with the heat we get here in North Carolina, the greens would tend to start thinning out. As the sunlight hit the soil surface, algae would begin to form."

Although completion of the new greens in the fall of 1990 virtually solved the

drainage problem, Rogers says that even the new greens tend to thin out during extremely warm, wet summer periods, opening the way for algal scum outbreaks.

Experimenting—"Since algae was a major problem here, I did a lot of experimenting," says Rogers. He tried a mancozeb fungicide, and then hydrated lime as a curative, at rates of 1 lb./1000 sq.ft.

"Spraying hydrated lime is very tricky," he says. "If you overlap, if your calibration

is off, or if you fail to water it in properly, lime can cause a lot of damage. It will actually burn the bentgrass. That's what made me look into alternatives."

Following the 1990 season, he first improved air circulation on several greens where severe mounding and undulations caused air to stagnate, and he began a chemical control program.

"In a trade journal article, I learned that some superintendents found that applications of Daconil 2787 at higher label rates had the side benefit of preventing algae on greens. In 1992, I decided to try it," Rogers notes.

The program began with weekly applications in May, at a rate of 8 oz./1000 sq.ft., which were reduced to 6 oz./1000 sq.ft. by summer's end.

"The results were that we had virtually no algae formation on any of the greens last summer," he notes. "We did have some greens thin out, as we expect every year, but no algae was forming on them. The greens stayed in good shape."

In addition, there was virtually no disease.

"In the past, I had used fungicides on a preventive basis, usually with lower rate applications every 10 to 14 days," he explains. "We used a rotation to avoid any resistance problems, but we still had brown patch cropping up. We found this year that by upping the rates of Daconil 2787, we seem to have solved both problems."

"In 1992, we felt that we had the best greens in the city, and some of the best in the state. Not a single green had any serious problems."

Total rounds went from 16,000 in 1987 to 37,000 in 1992, without a change in the club's membership.



Algae was virtually eliminated from Carolina's greens following treatment.

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LAWN CARE INDUSTRY

Bio Green believes in quality service; making the sale, too

Northern Virginia firm growing in spite of being on high end of prices.

■ Until a customer signs the check, you really don't have a customer.

That's true even in lawn care—especially in lawn care—believes David Schrader who's keenly aware of the cosmic connection between getting paid and staying in business.

"You have to look at lawn care from two ends at once—quality service and sales. You need both," says Schrader.

Some other Schrader tenets include:

● **Charging enough to make a profit.**

"There probably are only one or two companies in our market more expensive than us," he says.

● **Giving customers exactly what they want.** "We offer organic programs, pesticide-free programs and traditional programs, but 99 percent of our customers still want nice, green lawns," he says.

● **Having the same technician treat the same lawns whenever possible.** "How else is a technician going to know that that same south-facing, sunny slope in a client's lawn is going to have that grub problem," he says.

Schrader and Mark Stoeckel operate Bio Green Lawn Care which, this season, will treat more than 2,000 home lawns in addition to providing tree/shrub care and sprinkler services to several hundred other northern Virginia property owners.

Of the two, Stoeckel has more lawn care experience. He worked with several other firms prior to helping start Bio Green Lawn Care six years ago. Schrader, a 1984 University of Maryland graduate (agronomy specializing in soil conservation) likes sales. It shows. He thinks \$1 million in sales is realistic for Bio Green this season. It served about 2500 lawn and shrub customers in 1992.

"We try to drill the concept of quality, quality, quality into our company. Certainly, we want our customers to recognize the quality of our service, but we've still got to sell and sell," says Schrader.

That means no estimates dangling from door hangers. No vague price quotes over the telephone.

The best way to sell a quality, higher-priced service, says Schrader, is face to face. "If a prospect isn't going to sit down for 15 minutes and talk with us, they're not going to hire us," he says.

In other words, if Schrader walks a lawn with a potential client and gives them



David Schrader, left, likes sales, while Mark Stoeckel oversees production.

all the reasons why they should hire Bio Green, then he's most definitely going to ask for the check.

Similarly, Bio Green technicians develop friendly, workable, face-to-face relationships with customers, to the extent that time and schedules allow anyway.

"People hire lawn care companies because they don't know what to do," says Schrader. "That's why our technicians always try to do three things with each customer. We tell them what we did. We check off what they should do, and we tell them what's supposed to happen.

"That's always a lot better than leaving behind a computer printout of your visit."

Schrader's optimism is genuine and growing. His older brother, Steve, until recently a restaurateur, is joining Bio Green. "He's going to be pushing a spreader. We want him to get to know what we do," says Schrader with a wicked grin.

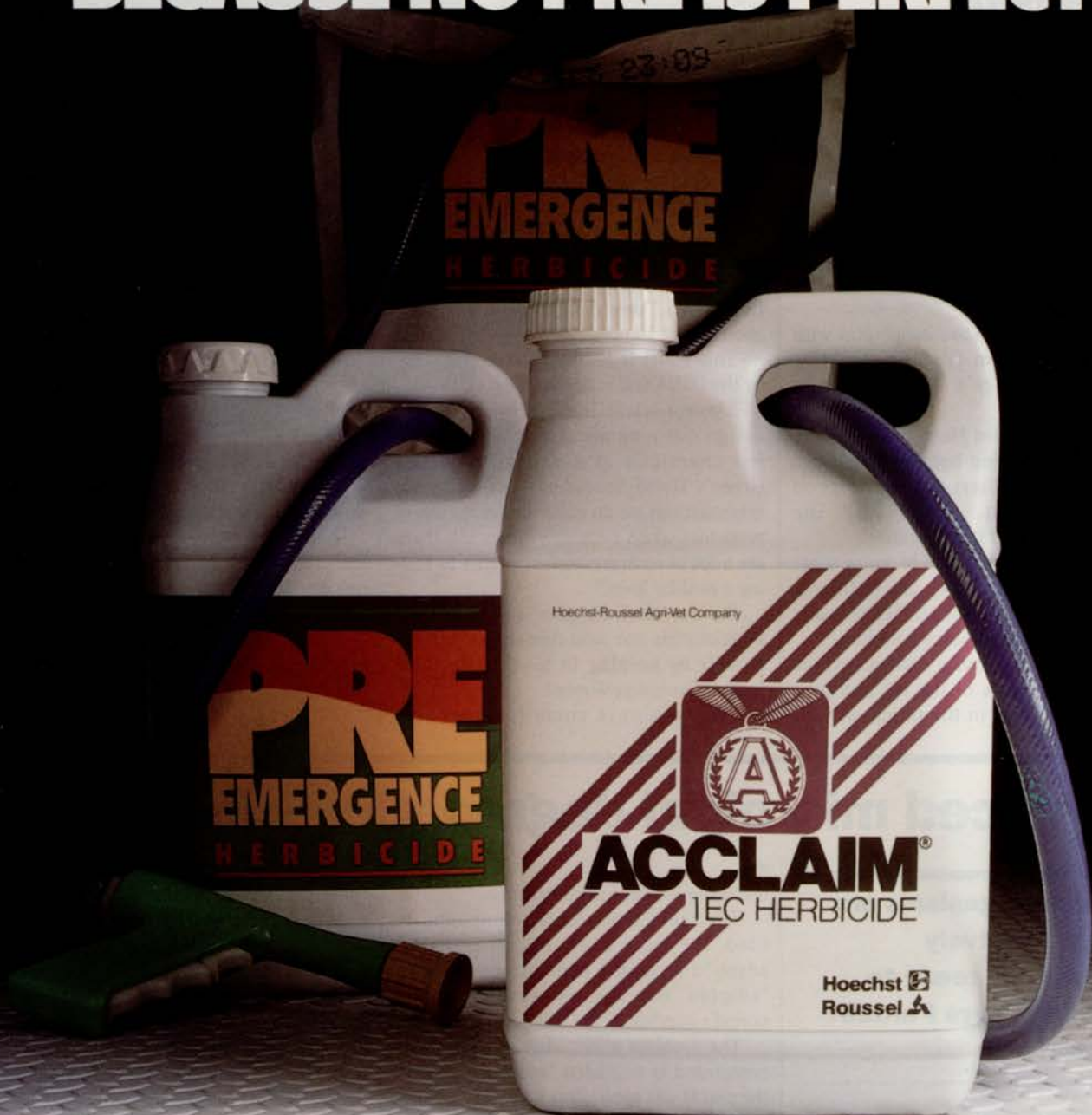
Also, the company, with offices in Manassas and Ashburn, eyes an expansion south into Fredericksburg, Va., in 1994.

—Ron Hall



BioGreen Lawn Care staff must be able to give clients a 'menu' of programs.

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Circle No. 117 on Reader Inquiry Card

Extension service program to educate homeowners about proper lawn care is a winner in Va.

■ Bio Green Lawn Care cooperates with the Prince William (Va.) Cooperative Extension Service's Water Quality Program.

Program specialist Marc Aveni says the program is educating homeowners about the impact of fertilizers and pesticides on the environment, specifically the Chesapeake Bay and its tributaries.

"We want homeowners to know what they're doing before they use fertilizers and pesticides," says Aveni. "We're really looking at non-point source pollution."

The extension service conducts three two-hour field days in the fall and four two-hour field days in the spring on vari-

ous lawn/landscape care topics.

It's also enlisted 60 volunteer lawns. The homeowners have agreed to follow all program recommendations. Information on the amount and type of materials they use is being recorded, along with their results.

After a season, some of these homeowners will allow their lawns to be used as "demonstration lawns." Aveni says there are about 10 now.

This effort is jointly funded by the USDA and extension.

"As our name implies, we design our programs using as few chemicals as possible," says Bio Green's David Schrader. "But we're not extremists so we do make judicious use of pesticides when necessary. After all, there are a lot of environmental benefits to having a healthy lawn."

Partner Mark Stoeckel says lawn care professionals can help themselves immeasurably by keeping in touch with their local extension personnel.

"We've always come to them as a



source of information whenever we run into problems. They've helped us tremendously in our business," says Stoeckel.

Aveni, for his part, thinks the professional lawn care industry—and he singled out Bio Green—has been supportive of the Water Quality Program.

"They know that what's good for the environment is also good for business," says Aveni.

—Ron Hall

Enhanced microbial degradation—it's real!

Soil micro-organisms are 'hungry, relatively immobile and ready to reproduce,' says Purdue educator.

■ Soil microbes are hidden, but they're real. You should know about them.

Indeed, there may be as many as 500 million micro-organisms (7,000 to 10,000 different species) in one gram of soil, typically clustered in small clumps or micro-colonies on/near food sources, says Purdue University microbiologist Dr. Ron Turco.

Turco describes them as "the powerhouse in the soil, the driving force controlling what really goes on in the soil system."

No wonder then that the chemical industry has a term for what they do to pesticides: enhanced biodegradation.

Soil micro-organisms, through their amazing reproductive abilities, can develop populations capable of rapidly breaking

down some chemical compounds.

The more a particular compound is used, the more likely microbes are to adapt to it. As the populations of these "adapted" microbes increase, the compound's survival in the soil decreases.

The problem arises when the chemical compound is degraded before it controls the pest it was applied for.

"When you apply some pesticide to the soil, bacteria view that pesticide as a free lunch," says Turco. "They're very happy to see the arrival of the chemicals. It's a much more readily available material than what they're normally living on which is the slow decomposition of organic matter in the soil."

Turco says to reduce incidences of enhanced biodegradation:

- rotate different chemicals in different classes, and
- limit the use of soil-active prophylactic chemicals.

In other words, when

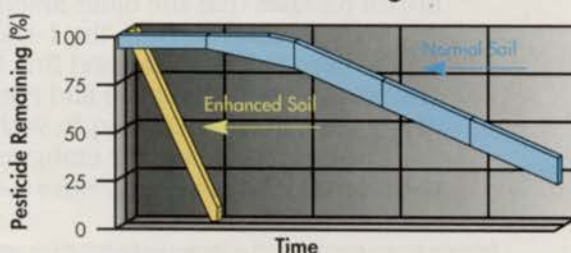
chemicals are used to treat problems as they occur, rather than making blanket preventive applications, they stand a much smaller chance of accelerating the biodegradation process.

Turco presented much of the above information at the Golf Course Superintendents Association America Conference in Anaheim, Calif., this past January.

In answer to a question from the floor, he said the potential for enhanced biodegradation is just as significant in thatch as it is in soil.

—Ron Hall

Enhanced vs normal degradation



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REEMAY

'Moments of truth' separate the good, the bad, the ugly in service

Doing only what the customer expects, even if you do it well, will get you only a 'C' from a client.

■ Why are some lawn care companies able to charge more for their services and still build market share while competitors struggle?

Service. They make it easy for customers to do business with them. That's what Ron Zemke, a nationally known business consultant, says.

He also says that businesses that place a premium on service:

- 1) charge, on average, 10 percent more for their basic products and services.
- 2) grow market share at 6 percent compared to 1 to 2 percent for those who don't.
- 3) have a return on sales of about 12 percent compared to 3 to 4 percent for those who don't.

Zemke this past February led about 250 green industry professionals through the building of "service-centered" organizations at the Associated Landscape Contractors Association (ALCA) Executive Forum in Tucson, Ariz.

Crucial to service success, says Zemke, is how well an organization manages the "moments of truth." He describes a "moment" as *any* time a customer comes in contact with some aspect of your business and has an opportunity to judge your company's service quality.

First in a series on Zemke and quality service

If your organization does everything a customer expects, that client gives you only a "C" on their report card. If the client has an experience with your company that annoys them, then your company gets a "D" or "F" grade, he says.

Your organization must develop and put "enhancers" into its service to develop a loyal and satisfied client. Give clients more than they expect to get an "A."

"The only way you learn about these moments of truth is by setting down and asking the right questions of your customers," says Zemke.

- ✓ What is it you expect from us?
- ✓ What is it you've experienced from our organization?
- ✓ What has made you unhappy with our service?
- ✓ What has been an exceptional experience you've had in dealing with us or someone like us?
- ✓ And, what did we do to make that a memorable experience?

For information about Ron Zemke: Performance Research Associates, 821 Marquette Ave., Suite 1820, Minneapolis, MN 55402; (612) 338-8523.

—Ron Hall



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HOT TOPICS



Ken Gerlack



Twyla Hansen



Tim Hiers



Bill Prest



Mark Schlossberg



Brian Storm

Reader panel will advise on green industry

Six LM readers selected for special committee on editorial quality.

■ Ken Gerlack, Twyla Hansen, Tim Hiers, Bill Prest, Mark Schlossberg and Brian Storm have been named to LANDSCAPE MANAGEMENT's first "Reader Advisory Panel," to serve 14-month terms.

In their roles, the six will be responsible for grading recent issues of LM as to editorial content and usefulness. They will also be called upon to suggest topics for future articles and will occasionally appear as contributing authors.

"We are excited about our new affiliation with these six key readers, who have impressed us as having their fingers on the pulse of the green industry," notes LM editor-in-chief Jerry Roche. "This is another way the magazine has devised to serve its readership more efficiently. We are looking forward to working with all of them."

● **Gerlack** founded Contra Costa Landscaping in Martinez, Calif. in 1970. He is active in the Associated Landscape Contractors of America and the California Landscape Contractors Association, in

which he was awarded a Life Member award earlier this year.

Gerlack holds a degree in ornamental horticulture from Cal Poly/San Luis Obispo.

● **Hansen** is grounds manager at Nebraska Wesleyan University and curator of Alice Abel Arboretum in Lincoln, Neb. She has held those positions since 1982. She is a former officer and board member for the Sports Turf Managers Association, the Nebraska Turfgrass Foundation and the Nebraska Statewide Arboretum. She is also chair of the Lincoln Community Forestry Advisory Board.

Hansen received her bachelor's degree in horticulture from the University of Nebraska-Lincoln.

● **Hiers** has just been named to the staff of Collier's Reserve in Naples, Fla., after serving eight years as golf course manager at John's Island Club, Vero Beach, Fla. At John's Island, Hiers supervised 54 golf holes. He had previously been superintendent at Quail Ridge in Boynton Beach, Fla. and at Sun Tree in Melbourne, Fla.

Hiers, a Certified Golf Course Superintendent, is past president of the Florida GCSA and was Distinguished Service Award winner in 1986.

● **Prest** started working at Springvale

Country Club in North Olmsted, Ohio, at the age of 14. He has been superintendent there for 25 years, and is now superintendent and assistant general manager. Prest is a member of the national GCSAA and the Northern Ohio Chapter of the GCSAA, where he is a member of the Employment Relations Committee.

● **Schlossberg**, who has a degree in agronomy from the University of Maryland, is president of Pro-Lawn Plus in Baltimore, Md.

He is a member of the Maryland Alliance for the Responsible Regulation of Pesticides and on the board of directors of the Maryland Turfgrass Council.

● **Storm**, owner of Terrascaping Inc. in Birch Run, Mich., is immediate past president of the National Landscape Association. He has a degree in landscape and nursery management from Michigan State University.

Besides being president of the Michigan Nursery & Landscape Association in 1986, Storm is also active on the American Association of Nurserymen's public relations committee.

Six new panel members, to serve 18 months, will be named in June, 1994 at the end of the current panel's terms.

ELSEWHERE

**Scientists waver
on 2,4-D hazard,
page 59**

**LCO takes his
stand in court,
page 59**

**Forestry comes to
urban horticulture,
page 62**

Panel: 2,4-D, cancer link 'weak'

Report from scientific panel this summer to say relationship of herbicide, cancer is 'weakly possible,' and 'weakly suggestive.'

WASHINGTON—A panel of scientists is expected to tell the U.S. Environmental Protection Agency that evidence suggesting 2,4-D is a carcinogen is limited.

The EPA's 10-member Special Joint Committee on the Weight of Evidence of Carcinogenicity of 2,4-D convened, in a two-day meeting here in early April, to assess several published connections between exposure to 2,4-D and cancers in dogs and farm workers.

It zeroed in on the results of National Cancer Institute studies on farm workers in Kansas, Nebraska, and Iowa; a key dog study; and a continuing investigation of

the health of chemical manufacturing plant workers provided by Dow Chemical Co. (now DowElanco).

The panel will issue a report by late June. After the report is presented to EPA Administrator Carol Browner, the agency will make a decision whether to put the herbicide in special review or take other measures to restrict its use.

Although Sheila Zahn, the principle author of one of the NCI studies, defended the study's quality, the scientists decided the evidence didn't appear to be as definitive.

Five of the scientists felt the evidence was "weakly suggestive" of a herbicide-cancer link, three opted in favor of the term "weakly possible" and one voted for a "possible" link.

Dr. Genevieve Matanoski, Johns Hopkins University School of Hygiene and Public Health, said she felt the human epidemiologic data "in and of itself is very weakly suggestive."

She also pointed out that the dog study linking non-Hodkins lymphoma to 2,4-D exposure stands alone and hasn't been confirmed by other studies. The panel agreed that 2,4-D was "an improbable animal carcinogen" based on the toxicological data.

Several of the scientists said they felt the epidemiological studies didn't explain 2,4-D's mechanism of action.

The scientists agreed that more data will probably be needed regarding multiple chemical exposures to farm workers.

Daniel Wartenberg, Environmental Health Division of the Environmental and Occupational Health Sciences Institute, said while the evidence against 2,4-D isn't compelling, it should still be considered.

2,4-D is believed to be the third most used pesticide in the United States. About 70 million pounds are used each year in agriculture, turfgrass, rights-of-ways, etc., says the EPA.

—Ron Hall

Oklahoma LCO and TruGreen square off over 'non-compete'

OKLAHOMA CITY, Okla.—When Donn Smith bought his ServiceMaster Lawn Care (SMLC) franchise in Oklahoma City, Okla. in 1989, he figured he had a winner. He was right.

Central Oklahoma's economy was looking up, and lawn care was one of its bright spots. Contractors were building homes and the homes were selling. Curb appeal had returned to the oil patch.

In fact, Smith says his operation was one of the top SMLC franchises in the country. Early in 1991, he also bought the TruGreen operation in his market area. (By this time TruGreen, and all its branches, had become a part of ServiceMaster Consumer Services.)

In making the deal, Smith had signed another SMLC franchise agreement, one containing a non-competition clause. The clause was one of the conditions of the sale, he says.

Now this clause is the focus of a legal battle between Smith and TruGreen.

That's because on May 23, 1992, TruGreen bought ChemLawn, including a ChemLawn operation that competed against Smith's SMLC franchise. Within weeks of the TruGreen/ChemLawn merger, TruGreen approached Smith with an

offer, but Smith says he didn't like the terms of the offer.

"All I wanted was a reasonable settlement," he maintains.

"After that, things just went sour," says Smith, who says he just wants to run his business as usual.

In July, 1992, Smith says his attorney called TruGreen and asked them to either settle the matter of a SMLC franchise (Smith's company) competing against a parent company operation (ChemLawn) or face the possibility of a lawsuit.

But TruGreen, Smith says, beat him to the punch and sued him in the Chancery Court of Tennessee, Memphis. TruGreen's complaint charges Smith with breaking his franchise agreement and asks for a judgement for franchise royalties plus costs and attorney fees. The complaint maintains that TruGreen is not a wholly-owned subsidiary of ServiceMaster Consumer Services, and that the franchise agreement that Smith signed "is for a non-exclusive franchise."

Smith's counter-claim, requesting a jury trial, seeks a total of \$4 million in compensatory and punitive damages from TruGreen Limited Partnership, The ServiceMaster Company Limited Partner-

ship and ServiceMaster Consumer Services L.P.

The counter claim maintains that the "company-owned" ChemLawn in Oklahoma City competes against his franchise in violation of the non-competition clause he signed when he purchased the local TruGreen branch.

—Ron Hall

GREEN INDUSTRY EVENTS

MAY

April 23-Oct. 17: IGA Stuttgart Expo '93 (int'l. garden show), Germany. Contact: Walter Gehring, (0711) 25709-0.

18: Florida Chapter, Sports Turf Managers Association meeting and tour, Palm Beach, Fla. Polo Grounds. Contact: John Mascaro, (305) 938-7477; or Ed Birch, (305) 938-0217.

20: Pre-Season Football Turf Maintenance Clinic, Notre Dame University, Notre Dame, Ind. Contact: Sports Turf Managers Association/Midwest Chapter, (708) 439-4727.

JUNE

3: Rutgers Turfgrass Research Field Day, Freehold, N.J. Contact: Edmund Milewski, (201) 285-8300.

continued on page 62

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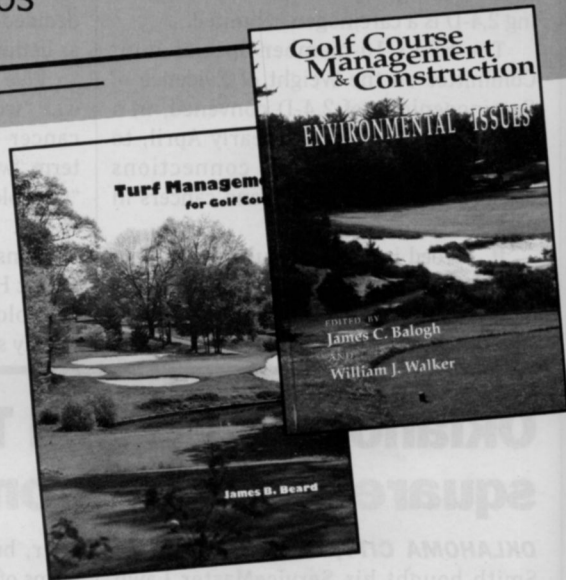
Golf

Golf Course Management and Construction: Environmental Issues

edited by James C. Balogh, Ph.D., William J. Walker, Ph.D.
For turfgrass specialists, landscape and golf course architects, developers, superintendents and land-use regulators, this volume summarizes and assesses environmental effects of turfgrass system construction and maintenance. Covers water resources, fertilization, pesticides, integrated management systems, wildlife, wetlands, aquatic and terrestrial toxicity tables. 976pp. BK-617-\$65.00

Turf Management for Golf Courses by James Beard

Written by the eminent turfgrass researcher, this USGA sponsored text is an ideal reference and "how to" guide for your bookshelf. This comprehensive guide details all phases of golf course operations including course design and construction, turf management, course administration, irrigation, equipment, and disease and pest control. 642pp. BK-615-\$74.00



Turf

Turf Managers' Handbook by Daniel and Freeborg

2nd. ed. Totally revised and updated, this valuable and practical guide targets the turf practitioner. Chapters on grasses, growth regulators and diseases have had extensive modifications. Innovations resulting from research and practice have been added to reflect the current techniques available for turf manager. 437pp. BK-110-\$39.95

Controlling Turfgrass Pests by Shurtleff, Fermanian, Randell

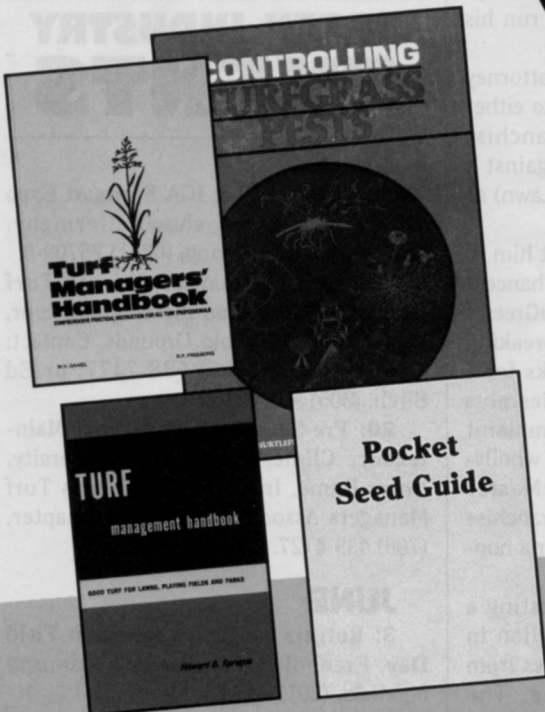
New comprehensive guide provides the most up-to-the-minute information available on the identification, biology, control and management of every type of turfgrass pest. 449pp. BK-220-\$56.95

Turf Management Handbook by Howard Sprague

This is a practical guide to turf care under both healthy and poor turf conditions. Chapters cover turf in cooler and warmer regions, fertilizer use, regular turf care, weed and disease control, and special turf problems. Useful seasonal schedules for management of turf areas. 255pp. BK-620-\$26.60

Landscape Management's Pocket Seed Guide

You'll refer to this handy guide again and again. It provides sections on why seed?, overseeding, Florida study, adaptability and disease susceptibility. Section 2 covers the National Turfgrass Evaluation Program results about perennial rye grass, Kentucky blue, Bentgrass, and Fineleaf fescues. Quick supplier listing included. 36pp. BK-655-\$10.00



Pocket Seed Guide

TURFGRASS SCIENCE AND CULTURE

JAMES B. BEARD



Turfgrass: Science and Culture by James Beard
This is the comprehensive basic text and reference source used in many leading university turf programs. It includes findings of current research compiled from more than 12,000 sources. 658pp. BK-630-\$62.95

Turf Irrigation Manual by James Watkins
The perfect guidebook for engineers, architects, designers and contractors. Keeps pace with the latest developments in turf and landscape irrigation. Specific chapters deal with rotary sprinkler design systems, golf course design systems, and expanded engineering and reference materials. 364pp. BK-640-\$32.95

Turf

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Turf & Ornamental Chemicals Reference

1993 Turf and Ornamental Chemicals Reference

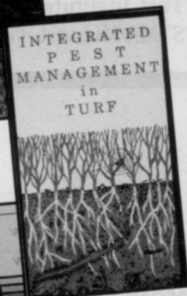
2nd. ed. For every professional who makes decisions about the selection, proper use, storage, and handling of chemical products. Provides fast access to new developments. Includes complete product label and information organized by manufacturer, tabbed for quick reference, indexed six different ways, by brand name, manufacturer, product category, common name, plant and site use, pest use. Complete product Material Safety Data Sheets alphabetized by company and brand name, HazCom, SARA and OSHA regulations, table of DOT shipping information, storage requirements, application/record keeping chart. 930pp. BK-645-\$110.00

Compendium of Turfgrass Diseases by Dr. Richard Smiley, Peter Dernoeden, Bruce Clarke
2nd. ed. Contains important new information on biological disease control, root-infecting fungi that cause patch disease, diseases, disorders, and causal agents. Over 60 color photos for easy disease identification. Covers abiotic agents of noninfectious diseases, foliar and/or root diseases, disease diagnosis and control strategy. 128pp. BK-650-\$30.00

VIDEOS! The Most Effective and Economical Training For New and Current Staff:

IPM in Turf (VHS Video)
See how an Integrated Pest Management (IPM) program for turf increases pest control, cuts costs, reduces use of pesticides and protects health of the environment. Learn how to effectively monitor weeds, insects, diseases, then use habitat modification, horticulture, physical/mechanical, biological and least-toxic chemical controls. Thorough, interesting, practical. Sell your clients on the IPM concept. Help your turf business prosper. VD-100E-\$89.95

Professional Turf Management (VHS Video)
A good turf specialist needs a good education and varied practical experience. This video shows all required in the maintenance of turfgrasses. Starts with how grasses grow and looks at what a site assessment determines. Learn: common types, mowing, irrigation, soil fertility, fertilization, cultural practices, weed/insect/disease/pest control. VD-101E-\$89.95



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EVENTS from page 59

10: Cornell Turfgrass Field Day, Ithaca, N.Y. Contact: Cornell University Dept. of Floriculture & Ornamental Horticulture, (607) 255-3134.

11: Sports Turf Workshop, Loras College, Dubuque, Iowa. Contact: Gary Peterson, Iowa Sports Turf Managers Association, (515) 791-0765.

16: Lofts Seed Annual Field Day, Martinsville, N.J. Contact: Cindy Kinnette, (908) 560-1590 or (800) 526-3890.

16: Chesapeake Sports Turf Managers Association meeting, Meadowbrook Maint. Facility, Chevy Chase, Md. Contact: STMA/Chesapeake, (301) 865-0667.

17-18: Park & Recreation Design Symposium, Little Rock, Ark. Contact: National Institute on Park and Grounds Management, (414) 733-2301.

22: Diagnosing Landscape Disorders, University of California, Riverside, Calif. Contact: Ted Stamen, (909) 683-6491.

30: National Midwest Regional Sports Turf Institute, Wheaton College. Contact: STMA/Midwest, (708) 439-4727.

Forestry comes to the city

HARRISON, Neb.—A statewide pilot project aimed at bringing forestry conservation practices to town in order to enhance the quality of Nebraska communities is under way here.

"Today, rural forestry is heading to town—literally," says state forester Gary L. Hergenrader at the University of Nebraska-Lincoln.

The project, called Conservation Forestry in Communities (CFC), is being implemented here through a cooperative effort of the Center for Semi-Arid Agroforestry and the Nebraska Forestry Service.

Hergenrader says conservation trees in a community performs a host of functions:

- protect schools, hospitals, shopping and recreation areas;
- improve water quality;
- stabilize stream and lake banks;
- act as living snow fences;
- screen unsightly areas;

- improve wildlife habitat;
- aid in noise abatement; and
- provide aesthetics.

Thirteen CFC demonstrations have begun, including an 11-row living snow fence of trees in Harrison, Neb. It will consist of many species, but will emphasize shrubs and conifers because of their snow-catching capabilities. Additional benefits, Hergenrader contends, might include reduction in city utility bills and energy consumption, and a decrease in the cost of snow removal.

Another long-term project involves planting a green belt around the town for both added protection and landscape beautification.

"By applying what we have known for decades about the value of conservation trees in protecting farms and ranches, communities can reap the benefits of cleaner, quieter and healthier surroundings," Hergenrader says.

INFO CENTER

Useful literature and videos for LM readers

MONEY TALKS...The American Association of Nurserymen is offering a 90-page book titled "Financing Your Business." If you've ever needed to borrow money, green industry consultant Frank Ross tells you how to go about it: evaluating your company's credit worthiness, identifying potential money sources. To order a copy, mail \$91.50 (non-AAN members) or \$51.50 (members) to: AAN, 1250 I St., NW, Suite 500, Washington, DC 20005. MasterCard, Visa orders accepted.

HAZARDOUS STORAGE...Safety Storage Inc. has a video, "Professional Hazmat Solutions," concerning safe storage and containment of chemicals and hazardous materials. It explains how the company's pre-fabricated buildings and secondary containment products can be used to ensure compliance with regulations. The VHS video is available *free* by writing Safety Storage, 2301 Bert Dr., Hollister, CA 95023; or by phoning (408) 637-5955.

WHAT PRICE?..."How to Value Any Business" describes an accurate, simple technique to value any business. You are

provided with all the formulas and information you need, and guided step-by-step through the evaluation. Ninety-two rules of thumb included. Send \$39.95 (Texas residents add \$3 sales tax) to: Wayne R. Irwin, Dept. LM, P.O. Box 2096, Baytown, TX 77522; or order by phone (713) 424-7651 to charge to MasterCard or Visa.

TREE IDENTIFICATION...Now you can identify and label any trees on customers' properties with the "Tree I.D. Kit" from the Lawrence Co. The kit contains a fully illustrated booklet, weatherproof plaques, a permanent ink marker and rust-proof nails. Each kit describes 39 commonly-found trees, with comments on more than 60 additional species. For more information, phone (800) 643-7468.

ENVIRONMENTALISM...New training videos entitled "Lawn Management—In Balance with Nature" are now available for LCOs and landscapers. They train employees and inform the public about turf care with an environmental focus. The set comes with a comprehensive eight-page manual. The videos are sponsored by

Monsanto Co. in cooperation with the PLCAA, PGMS and ALCA. They are not product-specific. The two-video set is available by phoning (800) 323-1421 or writing to Monsanto Fulfillment, 1325 N. Warson Rd., St. Louis, MO 63132. They are *free* (one set per request), while supplies last.

ABOUT AERATION...The second edition of "Lawn Aeration: Hard Soil to Cold Cash" shows how to start a lawn aeration department or a complete business for less than \$500. Author is Robin M. Pedrotti. To order, send \$29.95 to Prego Press, P.O. Box 23945, San Diego, CA 92193. For overnight shipping, add \$10.

ON PRUNING...A new, updated *free* video "The Power Pruner...Safest Way to the Top" is available Technic Tool Corp. It presents use of the Power Pruner's 2- and 5-foot extensions and other accessories, including the circle saw and automatic oiler. To receive a copy, write or call Nancy Keller, Technic Tool, P.O. Box 1406, Lewiston, ID 83501; (208) 746-9011 or (800) 243-9592.

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Typically, control is achieved in less than a week.

For best results, apply AMDRO insecticide as a broadcast application when ants are actively foraging. For individual colony control, spot treat with AMDRO. You'll find AMDRO is not only easy to use, but economical as well.

Don't let fire ants threaten the safety of your course. Put the proven power of AMDRO to work. And put an end to the queen's reign of terror.

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AMDRO® KILLS THE QUEEN.

PRODUCT SHOWCASE

New mower engine first CARB certified

American Honda's new GX120 general purpose engine became the first gasoline engine certified to meet the nation's toughest emission standard—the 1994 California Air Resources Board (CARB) emissions standards for small engines. American Honda plans to convert all other engine models to CARB-approved models by Jan. 1, 1994.

The GX120, a 4 hp overhead-valve horizontal-shaft lightweight engine, received approval of compliance from CARB almost one year before the effective date of the standard. The GX120 is used in edgers, pumps, small construction equipment and reel-type lawn mowers.

Honda professional mowers come equipped with

American Honda engines.

American Honda also recently introduced its new line of OHV horizontal-shaft V-twin engines. The 18 hp model is available in recoil and electric start while the 20 hp is available in electric start only. Options include Oil Alert, control box, high mount and side mount mufflers and various shaft sizes. All meet the CARB

standards. The V-twin line joins the GX (horizontal shaft) and GXV (vertical shaft) series engines. All three lines offer:

- overhead valve engine design on 4-hp and above
- chrome top piston ring
- vibration-reducing counter balancers on 8 hp to 13 hp engines
- electronic ignition

- dual element air cleaner on 4 hp and above

Optional engine features include:

- Oil Alert low oil warning system
- electric start
- 3 to 20 amp charging capable
- spark arrestor

Circle No. 191
on Reader Inquiry Card



PRODUCT REVIEW

Winter-hardy buffalograss requires little moisture

Bison buffalograss was cooperatively developed and released by Oklahoma State University and the USDA's Agricultural Research Station.

Johnston Seed Company of Enid, Okla., retains the production and marketing rights.

Bison is a synthetic variety, derived from the male and female parents of the "Mesa" variety plus a superior plant of each sex, selected from a Syn-1 generation planting of the Txoka variety.

The outstanding feature of Bison is that it is adapted to dry climates and is very winter-hardy, which allows it to be grown in the most northern regions, where buffalograss can be grown.

Bison is a sod-forming grass, dark green and fine textured. It spreads by both seed and stolon.

Bison is recommended for use on commercial and residential sites, athletic fields, golf courses, and locations requiring

erosion control.

Bison is a semi-arid grass adapted to survive under very low rainfall. It requires both sunlight and well-drained soil, and does not do well in areas with shade or excessive moisture. It grows best on heavy soil types rather than sandy soils, with a pH range from 6.0 to 8.0.

Bison buffalograss is an attractive and ecologically sensitive lawn grass requiring less fertilizing, watering and mowing, therefore aiding in water conservation and creating fewer clippings for disposal.

Circle No. 192 on Reader Inquiry Card

Conduct disease detection, diagnosis on the site

Neogen Corporation announce that it has completed the acquisition of the Alert and Reveal plant diagnostic tests kits from Agri-Diagnostics Associates.

The on-site plant disease detection test kits are rapid testing tools that allow users to conduct highly accurate disease detection and diagnosis without needing an

equipped plant pathology laboratory.

The tests are based on immunoassay methods in which antibodies have been



developed to recognize specific plant pathogens. By reading a color change, the user can determine if the pathogen is present and semi-quantitate the pathogen load.

The Alert test kits are available for detection of pythium, phytophthora, rhizoctonia and xanthomonas.

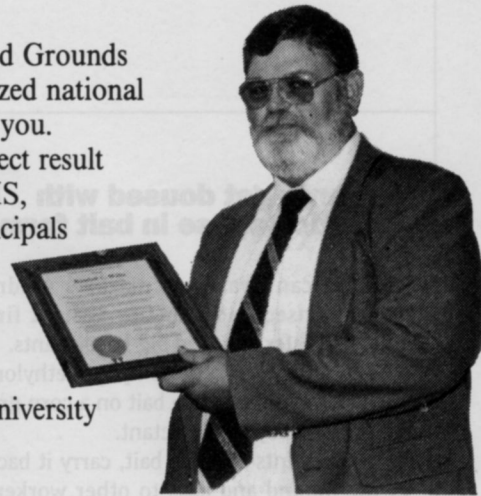
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The Case of the 'If's':

If
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"If I can become a *Certified Grounds Manager and win a recognized national maintenance award, so can you. Those attainments are a direct result of being a member of PGMS, dedicating myself to its principals and taking advantage of its programs."

Randy Willis, CGM
Grounds Supervisor
NW Missouri State University



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- monthly newsletter
- personal identification (membership card, certificate, hats, jackets, decals)
- certified grounds manager program
- training manuals
- discounts - rental cars, books
- membership directory
- awards
- information clearinghouse
- in addition, insurance programs now being developed.

*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.

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Hunt Valley, Maryland 21031 Tel. (410) 667-1833

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PRODUCT REVIEW

Fire ants get doused with insecticide, use in bait form

American Cyanamid markets Amdro fire ant insecticide for use against fire ants, harvester ants and big-headed ants.

The common name is hydramethylnon, and it is formulated as a bait on a corn grit carrier with soy oil attractant.

Worker ants find the bait, carry it back to the mound and pass to other workers and the queen.

The poison acts slow enough so as not to kill ants before they return to the colony.

Typical control occurs in several days to several weeks.

Broadcast application for wide area suppression or ant mound treatment for individual colonies.

Circle No. 194 on Reader Inquiry Card

Engine treatments protect, thanks to better lubrication

Petrolon markets Slick 50 products, engine treatments for both air- and water-cooled two-cycle engines.

The main benefit of these products is improved lubricity, meaning greater protection against engine scuffing and seizure.

According to Petrolon, tests have shown that there is a reduction in operating temperatures following treatment with Slick 50, and many users report increases in power output.

The Slick 50 two-cycle products are formulated zinc-free, specifically for two-cycle engines.

Petrolon recommends that two-cycle engines be treated every 2000 miles or 50 hours.

Circle No. 195 on Reader Inquiry Card

Broad spectrum granular labeled for industrial sites

American Cyanamid's Vegetation and Pest Control Department recently began to market its new TopSite 2.5G herbicide for use in a variety of industrial markets.

TopSite 2.5G is a broad spectrum, easy-to-use granular herbicide that controls many annual and perennial broadleaf



weeds and grasses. It is labeled for more than 100 plant species, including:

- johnsongrass;
- bermudagrass;
- foxtail; and
- quackgrass.

It may be used on a wide variety of sites, including electric utility substations, industrial facilities, railroad signal and light posts, equipment yards, petroleum and gas wellheads, and many other areas.

Circle No. 196 on Reader Inquiry Card

New model pruner now has a much longer reach

Technic Tool has 2-1/2 and 5-ft. extensions for its new insulated Model D Power Pruner.

The extensions are easy to install and reduce the need for ladders or bucket trucks. Operators can prune branches as high as 22 ft. above, while staying away from falling limbs.

Circle No. 197 on Reader Inquiry Card

Landscaping/Lawn Care Professionals

WHO MAKES MONEY ON YOUR SEEDING JOBS?

If you're paying someone else — or using old-fashioned methods or outdated equipment — it's not you.

Time is money. That's why you need Finn HydroSeeding equipment — the fastest, most reliable and time-efficient means of seeding. The Finn T-90 HydroSeeder gives you: 800-gallon working capacity that seeds, fertilizes and mulches 1/4 acre per load... spray distances up to 150'... even coverage... and one-man operation. Your choice of gas or diesel engine, skid or trailer mounted. Other tank sizes available from 300 to 3300 gallons.



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Circle No. 105 on Reader Inquiry Card

REVIEW PRODUCT



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COMMUNICATIONS

PUBLICATIONS • EXPOSITIONS • MARKETING SERVICES
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SHOWCASE PRODUCT REVIEW



Turf Tender carries, spreads big load

T.I.P. Inc. introduces the Turf Tender, a multi-purpose, high-capacity unit to transport and unload high-density material such as sand, gravel, dry topsoil, fertilizer, etc.

Chores it can be used for include: spreading flowable mixes; filling top dressers (over 1800 lbs. of top dress in less than a minute); traps and trenches; spreading stone for cart paths; top dressing fairways, driving ranges, tees and athletic fields.

Circle No. 198 on Reader Inquiry Card

Tree irrigation system helps trees establish deep roots

Salco Products Inc. says its new subterranean tree irrigation system can be installed when a tree is planted or retrofitted to existing trees.

"Trees are often planted in turf areas," says Sam Tobey, company president, "and the grass is often grown directly to the tree trunk. Water allocations for turf are often not sufficient for the deep water requirements of most trees. Or, the opposite could be true with trees requiring less water than is being applied to the surrounding grass. Either way, the tree suffers."

Water is irrigated from a 6-inch length of 1/2-inch slotted PVC pipe. The slots are about 0.004 inch and located around the side of the pipe. This permits the water to easily flow to the root ball of the tree but restricts contamination from entering the drip irrigation system.

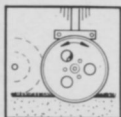
Circle No. 199 on Reader Inquiry Card

TURFCO EDGE-R-RITE MULTI-PURPOSE TURF EDGER

Just like a small sod cutter, the Blade does not spin, the oscillating motion does not throw debris.

Self-propelled and push models available.

Rugged design for commercial use.



Disc Blade



V-Blade

Optional Blades:

◀ Disc Blade for cutting straight edge along sidewalks and driveways.

Right Angle Blade for golf course sand traps, and flower beds.

◀ "V" Blade for removing a strip of turf along a sidewalk.



Right Angle Blade

Write or call
for detailed
literature

TURFCO

TurfcO Mfg., Inc.
1655 101st Ave. N.E.
Minneapolis, MN 55434-4420
612/785-1000
Telex 5106013762

Circle No. 106 on Reader Inquiry Card

More
information
on products
available by
circling the
numbers on

Reader
Inquiry Card

Sandoz's new biopesticide controls lepidoptera in turf

Sandoz Agro Inc. Turf & Ornamental's Steward biological insecticide provides cost-effective, consistent control of lepidoptera in turf without applicator toxicity problems.

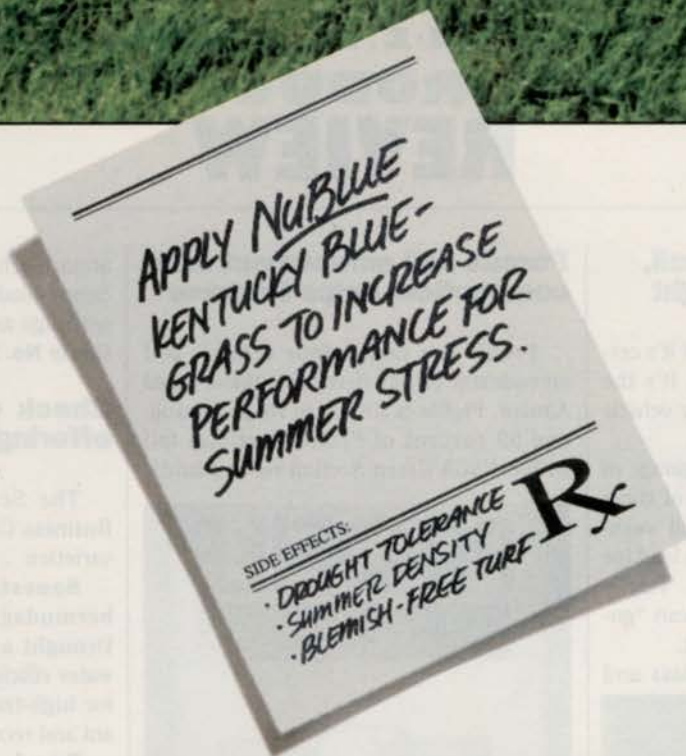
With Steward, according to Sandoz Agro, operators do not have to undergo regular cholinesterase testing related to organophosphates. Steward is safe for all humans, pets, birds, bees and natural predator insects. Steward is a wettable granule that is easy to mix.

Its two modes of attack effectively eliminate a variety of worms, including armyworms, cutworms, sod webworms and several varieties of caterpillars and moths. Steward is ingested by the insect, and within one to three days kills the pest by breaking down into small, toxic protein units that adhere to the stomach lining, disintegrating the cells of the lining.

In addition, the pests are poisoned by bacterial spores that germinate and multiply in the gut area, before passing through the gut wall causing septicemia.

Steward, a wettable granule, provides control for up to four days after application.

Circle No. 200 on Reader Inquiry Card



Does Your Bluegrass Suffer From Summer Heat Stroke? The Prescription is NuBlue.

New from Medalist America, it's **NuBlue** Kentucky Bluegrass. And when it comes to good breeding, our **NuBlue** is a real blue-blood, ranking with the industry's elite varieties in trial after trial.

Tough and resistant, **NuBlue** stands up to serious bluegrass diseases like leaf rust, leaf spot, melting out, pink snow mold and pythium. And **NuBlue** shows excellent early spring green-up when compared with other Kentucky bluegrasses. Medium-dark green in color, **NuBlue's** moderately fine-leaf texture and high density produce a great looking turf that stays healthy and green long into the growing season.

Call your Medalist America representative at 800-568-TURF for information about **NuBlue** Kentucky Bluegrass.



Circle No. 124 on Reader Inquiry Card

PRODUCT REVIEW

Improved vehicle can pull, haul more than its weight

It's may be new to industry, but it's certainly not new to outdoorsmen. It's the Pug, a fully articulated 4x4 utility vehicle manufactured in Turtle Lake, Wis.

The first Pugs were made in a garage in the 1960s, and several thousand of them were gobbled up by sportsmen and workmen seeking a better way to take a load (or themselves) into rugged country. Pug is being reintroduced to the American "go-anywhere, work-anywhere" market.

Pug, made of molded fiberglass and

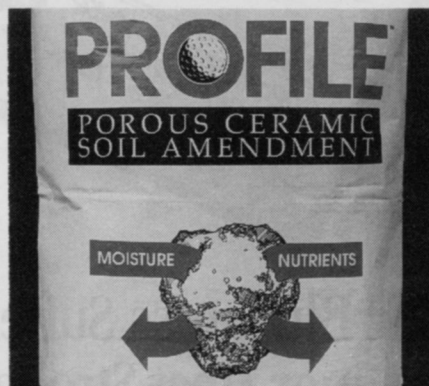


powered by Kohler's V2 20 hp air-cooled industrial engine, is about 10 feet long and weighs 1200 lbs. Pug's towing peak is 3000 pounds. With its four big 26x12x12 traction tires it can go just about anywhere. Its 100 percent automotive drive system has a standard auto clutch, 4-speed synchromesh transaxle, automotive drive line and Spicer differentials that is unique among utility vehicles.

Circle No. 201 on Reader Inquiry Card

Porous soil amendment aids compaction, helps turfgrass

Profile is a new porous ceramic soil amendment being offered by Illinois-based Aimcor. Profile is similar in shape to sand, and 99 percent of Profile particles fall within USGA Green Section recommenda-



tions for medium and coarse sands.

Profile's 74 percent pore space improves compacted and poorly draining turf areas.

Circle No. 202 on Reader Inquiry Card

Petpro offers product to clean up after pets

Petpro Products, Inc., offers The Scoop Dispenser for parks, municipalities and common grounds.

The all-weather dispenser eliminates "pet pollution" in parks and recreation

areas. Each dispenser holds 100 Dispoz-A-Scoop biodegradable scoopers and comes with sign and hardware.

Circle No. 203 on Reader Inquiry Card

Check out these new seed offerings from O.M. Scotts

The Scotts Company Professional Business Group offers new turfgrass seed varieties:

Sonesta—The number-one seeded bermudagrass in the National Trials. Drought and heat resistant, Sonesta is water efficient, low growing and developed for high-traffic areas. It's also wear tolerant and recovers fast after damage.

Brigade Hard Fescue—Brigade is low-maintenance, and requires less mowing, fertilization and watering, and was highly ranked in National Fine Fescue Trials.

Aztec Tall Fescue—Aztec is an all-around cool-season turf. It grows well in sunny or shady areas. It has a dark green, color, low growth and fine texture.

Molinda Chewings Fescue—Drought and shade tolerant, Molinda has a medium green color, high density. It's an attractive turf with minimal nitrogen and irrigation needs, and is resistant to dollar spot, red thread, leaf spot, fusarium patch.

Achiever Perennial Ryegrass—Achiever has high rated quality, color, texture; a high level of endophytes and high level of resistance to dollar spot,

Circle No. 204 on Reader Inquiry Card

KNOOS



WHORE

"THE PROFESSIONAL'S CHOICE"

MIDWEST 1-800-558-5667

SOUTHEAST 1-800-329-2203

MARKET SHOWCASE

Rates: \$105 per column inch for 1x insertion; \$100 for 3x insertion; \$95 for 6x insertion; \$90 for 9x insertion; \$85 for 12x insertion (one inch minimum). Frequency based on calendar year. For ads using a Reader Inquiry Number, add \$30 to the total cost of the ad per issue. For ads using a second color standard red, blue, green or yellow only, add \$65 to the total cost of the ad per issue.

Send ad copy with payment to: Brian Kanaba, LANDSCAPE MANAGEMENT, 7500 Old Oak Blvd., Cleveland, Ohio 44130, or call (800) 225-4569 ext. 155 outside Ohio; (216) 891-2665 inside Ohio; FAX (216) 826-2865.

HELP WANTED

LANDSCAPE MAINTENANCE/CONSTRUCTION

Established, Full Service Landscape Maintenance & Construction Company, seeks an experienced quality-minded individual to assist in the continued growth and development of our Maintenance Division. Duties include estimating, sales and scheduling. Must have Horticultural background, sales/estimating experience and 3-5 years field experience. If you are a hard working, responsible individual, please send a complete resume along with past work history and salary to:

Harder Landscape Contractors
63 Jerusalem Avenue
Hempstead, New York 11550

Contact Brian Kanaba at
216-891-3155 to Reserve Your Space
in Next Month's LM Showcase

SOFTWARE

Great software is only half the story.



Our full-featured landscape management software package is simple to learn and use. But chances are, you will occasionally have a question or two. That's why we have a toll-free support line to provide you with immediate answers to your technical questions.

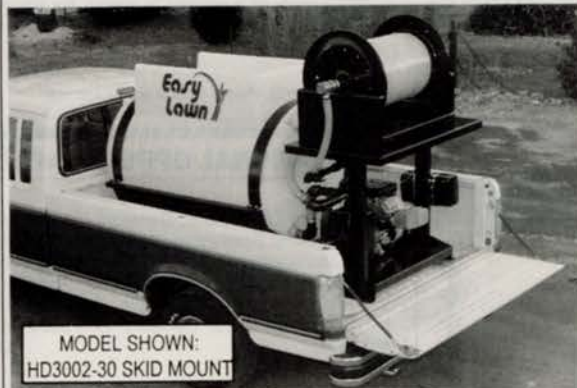
SuperScape™ With SuperScape's support line, you get the rest of the story. Call today, 800-299-9991 512-452-4500

Landscape Management Software

Circle No. 153 on Reader Inquiry Card

EQUIPMENT FOR SALE

LEADING THE INDUSTRY IN RESIDENTIAL HYDROSEEDING



MODEL SHOWN:
HD3002-30 SKID MOUNT

ONLY
\$169.00
A MONTH

MOST MULCH CAPACITY
LOWEST MAINTENANCE
LONGEST WARRANTY
BEST AGITATION
FASTEST MIXING

FREE FREIGHT!

"The Professional's Choice"

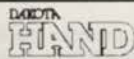
FOR INFORMATION CALL

800-638-1769



Hydro
Seeding
Systems

Circle No. 152 on Reader Inquiry Card



TREE TRANSPLANTER

Lightweight, Variable Size Rootball (16" - 28"). Available in 3 models (towable, bucket mount, 3 pt.), and SKID-STEER.

MID DAKOTA CORP.

Box 728 • Garrison, ND 58540

Phone (701)337-5619 or 1-800-327-7154

GSA Contract No. GS-00F-5442A



BUSINESS OPPORTUNITIES

LAWNCARE BUSINESSES:

Thinking about selling your Lawncare Business? We'd like to talk about the possibilities. If you are doing business in: Cincinnati, Indianapolis, Columbus, Dayton, Chicago, St. Louis, Atlanta, Cleveland, Detroit or Ft. Wayne, we are interested. All communication is confidential. Reply to LM Box 500, c/o LANDSCAPE MANAGEMENT, 120 W. 2nd Street, Duluth, MN 55802.

LAWN ASSISTANT

1 # 1



To get a FREE 90 page information booklet on the #1 software for the lawn and tree care industry

Call Toll Free:
1-800-422-7478

Real Green Computers
1970 Winner Street, Walled Lake, MI 48390

Circle No. 251 on Reader Inquiry Card

TRIMS

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FOR LANDSCAPE AND
LAWN CARE CONTRACTORS

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GENERAL LEDGER
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Call or write today for your FREE
Demo Disk and Literature to see
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(800)733-9710

COMMERCIAL INSURANCE
for
LAWN CARE OPERATORS

M.F.P. Insurance Agency, Inc.
50 West Broad Street, Suite 3200
Columbus, OH 43215
(614) 221-2398

Contact:

Richard P. Bersnak, President
or
Jeanne Bartkus

Circle No. 188 on Reader Inquiry Card



LANDSCAPE DESIGN KIT 3
48 rubber stamp symbols: trees, shrubs, rocks, step stones, vine, & more. 1/4-1 3/4 in. dia
\$74.95 + \$4.50 sh FREE 28 PAGE BROCHURE
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30'x40'x10'
\$4,177

BUILD IT YOURSELF AND SAVE MONEY. 5000 SIZES. ALL STEEL. CALL TODAY FOR BROCHURE AND PRICE QUOTE.

HERITAGE BUILDING SYSTEMS
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LANDSCAPE MANAGEMENT

CLASSIFIEDS

RATES: \$1.25 per word (minimum charge, \$40). Bold face words or words in all capital letters charged at \$1.50 per word. Boxed or display ads: \$105 per column inch-1x (one inch minimum); \$100-3x; \$95-6x; \$90-9x; \$85-12x. (Frequencies based on a calendar year). Agency commissions will be given only when camera-ready art is provided by agency. For ads using blind box number, add \$20 to total cost of ad per issue. Send ad copy with payment to Brian Kanaba, LANDSCAPE MANAGEMENT, 7500 Old Oak Blvd., Cleveland, OH 44130 or call 216-891-3155. Fax Number 216-826-2865.

BOX NUMBER REPLIES: Mail box number replies to: LANDSCAPE MANAGEMENT, Classified Ad Department, 120 W. 2nd St., Duluth, MN 55802. Please include box in address.

POSITIONS WANTED

FREE CLASSIFIED AD

To all "**POSITION WANTED**" Classified Advertisers!

- Maximum 40 words
- Maximum 2 issues

Offered as an industry service - Let LANDSCAPE MANAGEMENT help you with your employment needs. For more information contact:

Brian Kanaba
LANDSCAPE MANAGEMENT
7500 Old Oak Blvd., Cleveland, OH 44130
216-891-3155-Phone 216-826-2865-Fax

Position sought that involves research, technical service, or sales with a university, or company involved in furthering the turfgrass industry through education, communication, and scientific evaluation. Turfgrass Masters, June 1993. Paul Zarlengo, 5425 Frank Ave., Canton, OH 44720. 501-443-4229. 5/93

BUSINESS FOR SALE

Family-run pest control business for sale in Wayne, Oakland and Macomb Counties of Michigan. Established in early 1900s. Grossing \$100,000 per year. Excellent record with BBB. Established accounts. Call 313-294-8118. 7/93

REPS WANTED

SALES REPRESENTATIVE Manufacturer of high quality Liquid Fertilizers, Micronutrients and Natural Organics looking for qualified individuals with a high degree of horticultural knowledge (B.S., M.S. in horticulture or proven experience) and sales experience. You will be representing a company that provides its customers with quality service. The individual needs to be self-motivated. Must be willing to call on golf courses, lawn care and tree care companies, distributors, phone sales and some traveling. Send resume to: Growth Products, Ltd., P.O. Box 1259, White Plains, NY, Attn: Personnel Dept. 5/93

EDUCATIONAL OPPORTUNITIES

GRAYSON COLLEGE, Denison, Texas: Two-year technical program in Golf Course and Turfgrass Management. 18-hole golf course on campus. Dormitories, placement assistance, financial aid and scholarships available. Contact: GCC, 6101 Grayson Drive, Denison, TX 75020. 903-463-8653. 5/93

BUSINESS OPPORTUNITIES

LET THE GOVERNMENT FINANCE your new or existing small business. Grants/loans to \$500,000. Free recorded message: (707)448-0330. (OL8) 7/93

NaturaLawn® of America provides the Green Industry a successful, growth oriented, lawn care program. Discuss the opportunities available to you by calling the leader in **organic-based** lawn care. The franchise opportunity of the 90's. 800-989-5444. 6/93

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 800-326-9221 or write Lifetime Career Schools, Dept. LF0153, 101 Harrison St., Archbald, PA 18403. 9/93

EQUIPMENT FOR SALE

PIPE LOCATOR INEXPENSIVE! Locates, traces underground drain, water pipe lines of clay, PVC, ABS, steel, cement. Finds sprinklers, valves, clogs. Bloch Company, Box 18058, Cleveland, Ohio 44118. (216)371-0979. TF

BROUWER 24" SOD HARVESTOR 450 hrs, 3910 Ford diesel, \$20,000.00, Toro 5 gang fairway mowers excellent condition \$1,800.00, Phone: 517-332-8410. 7/93

NEW AND USED BROUWER EQUIPMENT: Mowers - VACS - Fork Lifts - Harvesters - and full line of replacement parts. Contact Ed or Glenn Markham at 1-800-458-3644. TF

FOR SALE: Used Brouwer Sod Harvesters. Excellent condition. Ready to go. Call Brian for parts. **HUBER RANCH SOD NURSERY**, Schneider, IN. Phone (800)553-0552. 5/93

HYDRO-MULCHERS AND STRAW BLOWERS: New and used. **JAMES LINCOLN CORPORATION**, 3220 S. Jupiter Rd., Garland, TX 75041. (214)840-2440, (800)551-2304. TF

REINCO HYDROGRASSERS and power mulchers in stock. Opdyke Inc., (Philadelphia Area) 215-721-4444. TF

FOR SALE: 1985 Jacobsen HF-5 Diesel. 100% ready for Spring, sharpened. \$6,000. Also, Toro GM-3 Greens Mower, sharpened. \$2,500. National 84" cut. \$1,200. Jacobsen 5 Gang Pole Type Fairway Mower. Completely reconditioned. \$3,500. 313-653-5695. 5/93

SPYDERS- New/Used/Rebuilt. Full line of replacement parts and update kits. Kubota, Ruggerini, Kohler and Onan engines and parts. Nichols-Fairfield torque hubs. We repair and rebuild Spyder hydraulic pumps and motors. **FAST SERVICE.** Call or write: Mobile Lift Parts Inc., 5402 Edgewood Rd., Crystal Lake, IL 60012. (815)455-7363, (800)397-7509, FAX (815)455-7366. 5/93

BUCKET TRUCKS: Straight Stick, Corner Mount and Knuckle Boom Cranes. Brush Chippers - New Morbark Disc and Drum Style. New Rayco Stump grinders. Best prices anywhere. Used Chippers - Asplundh, Morbark, etc. 2 to 8 usually in stock. Sprayers, Dumps, Stakes, Log Loaders, Crew Cab Chip Box Dumps, Railroad Trucks, 50 in stock. Sold as-is or reconditioned. We also buy your surplus equipment. Opdyke's, Hatfield (Philadelphia Area). 215-721-4444. TF

NEW/USED EQUIPMENT AND RENTALS— Asplundh, Hi Ranger, Holan and Lift-All Forestry Bucket Trucks, Chip Trucks and Chippers. Mirk, Inc., (216)669-2000, 7629 Chippewa Road, Orrville, Ohio 44667. TF

Reel Mowers: Hydraulic unit for Steiner Turf Tractor. Excellent condition, used once. \$5200 — Fertilizer Spreader: 4 ton stainless steel hopper, dual rear distribution, tandem axle, high flotation tires. \$1,400 — Spray Rig: Fits Chevy S10 or Ford Ranger, molded fiberglass with 150 gal. cap. and dry storage for 15/50# bags. Excellent cond. \$2100 — Jacobsen Aerator: 24" width, 5 hp Honda Engine, excellent working condition. \$985, 513-871-3992 — 86 Chevy 3/4 ton spray trucks. Fiberglass molded tanks and beds with 375 gal liquid cap and dry storage for 20/50# bags. 50,000 miles, newer tires. Good cond. \$6,800, 4 available — 1986 Chevy 3/4 ton service truck with or without 200 fiberglass spray unit. D50 Hypro pump, 5 hp. B & S Engine, with 300' hose. Together \$7,400, spray unit alone \$1,650. Call with best offers: 513-871-3992. 5/93

BUCKET TRUCK: Hi Ranger 65', 57', 50'. Sky-workers with chip boxes. Asplundh bucket trucks with chip boxes. Asplundh brush chippers. Bean 55 gal. sprayers. Pete Mainka Enterprises, 633 Cecilia Drive, Pewaukee, WI 53072. 414-691-4306. TF

Finn Hydroseeders, Mulch Spreaders, Krimpers, Pit Burners, Fiber Mulch & Tackifiers. New & Used. **Wolbert & Master, Inc.**, P.O. Box 292, White Marsh, MD 21162. 410-335-9300, 1-800-234-7645. TF

 **send a Classified Advertising message...**
...write here.

(Please Print) _____

1. Number of insertions: (circle) 1 3 6 12 TF (Till Forbid)
2. Start with (month) _____ issue. (Copy must be in by 1st of month preceding).
3. Amount enclosed: \$ _____ (To keep our rates as low as possible, payment must accompany order)

SIGNATURE _____ DATE _____
 NAME _____ COMPANY _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP CODE _____
 PHONE NUMBER _____

Mail ad copy to: Brian Kanaba, **Landscape Management**, 7500 Old Oak Blvd., Cleveland, OH 44130 or call 216-891-3155.

RATES: \$1.25 per word (minimum charge \$40). Boldface words or words in all capital letters charged at \$1.50 per word. Boxed or display ads \$105 per column inch, one time; \$100, three times; \$95, six times; \$90, nine times; \$85, twelve times (one inch minimum). (Frequencies based on a calendar year). For ads using blind box number, add \$20 to total cost of ad per issue.

FOR SALE

FOR SALE: JAC- E10 5 GANG BLITZER \$35,000 JAC- 3 GANG BLITZER \$1,500 TORO PACK MASTER 7 GANG MOWER \$4,500. 501-776-3802 JIM. 5/93

MAKE MORE MONEY with safe, efficient employees. Free catalog of over 100 professional training videos available from California Polytechnic State University. Perfect for landscape construction and maintenance companies, grounds crews, designers, etc. Call 1-800-235-4146. 6/93

FOR SALE: COMPUTER Slice System w/ALTO 3068/80 Megabytes hard drive, 2 user w/printer, U.P.S. Call Hardy (404)977-0981. 5/93

LAWN SEED: Wholesale. Full line of top quality grasses. Improved bluegrass varieties, tall fescues and fine bladed ryegrasses. We specialize in custom mixing. Olinger Seed Company, 89 Hanna Parkway, Akron, OH 44319. Call collect (216)724-1266. OH, PA, WV, MI, IN. TF

MEYER Z-52 ZOYSIA SOD FOR SALE. VAMONT and TUFOTE BERMUDAGRASS SOD. FORKLIFT DELIVERY. SERVING THE MID-ATLANTIC REGION. OAKWOOD SOD FARM, SALISBURY, MD 410-742-3086. 6/93

EQUIPMENT FINANCING

FINANCE your new or used **EQUIPMENT** acquisition through **LEASING**. Advantages include: no down payment, 100% tax deductible, flexible terms, fast approval. Call **TRIDENT** Leasing 412-325-3464 / FAX 412-325-3466. 5/93

SERVICES

STRENGTHEN YOUR BUSINESS AND GET HONEST RESULTS. 25+ years lawn & tree care advertising, budgeting, programs (organics, too), IPM, planning, training (admin. & field), pesticides, etc. Why go in circles? Call now! **CORNELL ASSOCIATES, 301-293-3605 "IN UNITY IS STRENGTH". 5/93**

NEED A MORE PRODUCTIVE WORKFORCE? We have hard-working, reliable and loyal Mexican Workers who can dramatically increase your production and make your company more competitive. Call Bob Wingfield, 214-634-0500. 6/93

Pumps - Wanner D-10 and D-25 Hydra-cell. New, reconditioned parts and complete 24 hour repair service. Call Industrial Services Co., 614-965-4112. New Lawn Care Hose Reel Swivel. 6/93

MARKETING SERVICES

INCREASE YOUR BUSINESS & KEEP YOUR CUSTOMERS with a customized, professional newsletter. You choose the articles and title! **FREE** marketing tips and information! **Special introductory offer!** For free sample and details, call TotalControl Inc. (800)432-5528. In Pennsylvania call (215)430-3960. TF

HELP WANTED

Landscape Management and Construction/Sales- New Jersey's largest Corporate Services Company seeks highly motivated individual to assist in the continued growth of its Landscape Management Company. Areas of responsibilities include: prospecting, estimating, and sales. Must have strong background in Professional Landscape Management Field together with proven sales experience. Please send complete resume and work history in confidence to: Control Environmental Services, 737 New Durham Road, Edison, NJ 08817. Attention Mr. Stewart. 5/93

LANDSCAPE MAINTENANCE & GENERAL SUPERINTENDENT: Largest landscape maintenance company in the nation seeking individuals with 3-4 years experience. Must be able to make decisions, be creative, self-motivated, organized with strong supervisory skills. San Francisco Bay Area location. EOE. Please send resume to: Environmental Care, Inc., 825 Mabury Road, San Jose, CA 95133. 5/93

LANDSCAPING/OPERATIONS: Hermes Landscaping, a well established contracting company, is seeking a self-motivated, professional manager to handle the operations of a Commercial Landscaping and Sprinkler Division. Must have a B.S. degree, 2-4 years of experience, people skills and hands-on supervisory experience. Send resume and salary history to: Hermes Landscaping, Inc., P.O. Box 14336, Lenexa, KS 66215. EOE. 5/93

Landscape Sales: Well established Commercial Maintenance and Installation Firm. Quality oriented and operated, a drug free work place. Will handle all sales in Southeast, Florida. Send resume to: Custom Care, 6560 E. Rogers Circle, Boca Raton, Florida 33487. 5/93

Supervisor, Mississippi University for Women, Campus Landscape Operations. Responsible for planning, budgeting, and implementation of landscape installation (Hardscape and Softscape and Irrigation) and complete landscape maintenance for 108 acre campus at Columbus, Mississippi. Salary commensurate with training and experience. Interested candidates should send resume with complete summary of experience to the attention of Bob Callaway, c/o Office of Personnel and Payroll Services, PO Box W-1609, Columbus, MS 39701. Position will remain open until filled. 5/93

SOFTWARE

TurfWorks™ - Your Best Buy. Version 4.0 just released. Customer/Job Tracking, Automatic Scheduling, Invoicing, Receivables/Cash Application, Monthly Statements, Chemical Usage Tracking, Marketing, Sales Analysis and more. Online help. Affordable price. Send \$4.00 and disk size for demo. Bellanger Group, 50 Clarkson Center, Suite 422, Chesterfield, MO 63017, 314/537-2025. 5/93

Route Manager System for scheduling and accounts receivable record keeping. Serving the Lawn Care Industry since 1982. List price \$350. Fortunato Computers, 46 N. 4th Street, Coplay, PA 18037. 800-275-0620. 12/93

Classified Advertising Increases Your Sales!

ADVERTISER INDEX

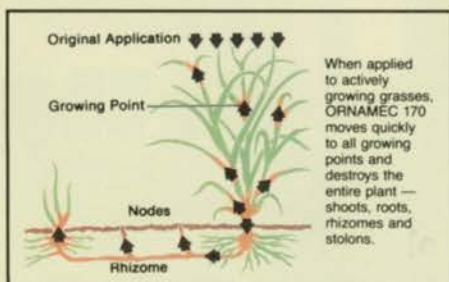
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Photo, top right, shows a landscaper's nightmare, where Ornamec 170 could save the day. Schematic drawing shows how Ornamec 170 takes all the fight out of quackgrass.



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