

**LM REPORTS: GOLF COURSE MOWERS**

MAY 1992 • \$3.00

# LANDSCAPE MANAGEMENT

INCORPORATING LAWN CARE INDUSTRY



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Pricing the  
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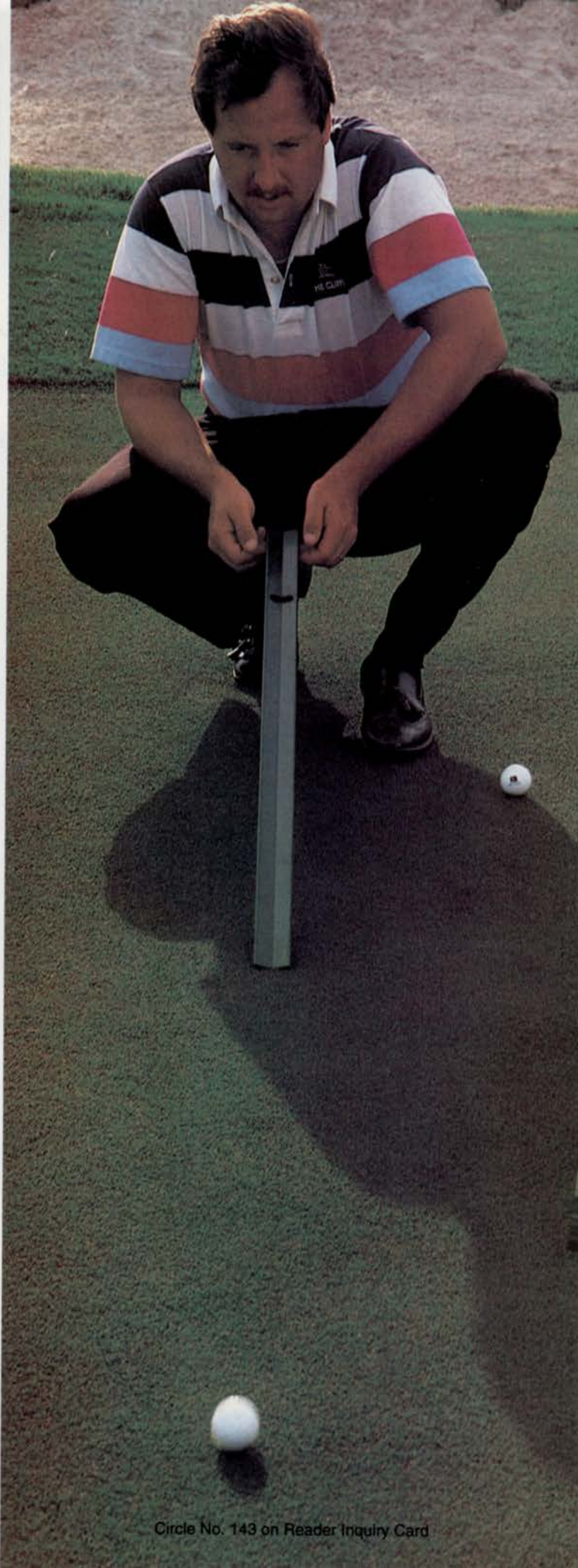
**Disease control  
strategies**



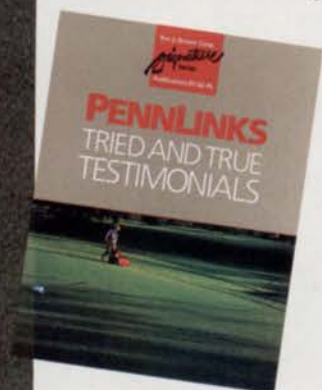


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## AS WE SEE IT

JERRY ROCHE, EDITOR-IN-CHIEF



### Does the public expect too much from its golf courses?

Larry Kassell, the Pacific Northwest's advertising whiz and disseminator of little-known facts, tells us that golfers take an average of 10 million steps per year on the average golf course green. That's about 700 steps per foursome.

Golfers fully expect all golf course superintendents to keep this downtrodden turf healthy and green. They expect this from the first signs of spring until the first snowfall—sometimes beyond.

Not unreasonably, supers wonder if golfers expect too much.

"We have been greatly affected by media presentations of our tournaments," notes William Spence, superintendent at The Country Club in Franklin, Mass.

Spence, speaking at the GCSAA conference, said maybe the time has come for the public to re-evaluate its expectations.

"I worry about the time," he observed, "when somebody comes up with an artificial turf for golf courses. Is the turf we're providing *now* artificial, in and of itself?"

"We're not going to get perfection. That second law of thermodynamics ('as time advances, disorder increases') will get us in the end."

Steve Cadenelli, the 1991 GCSAA president, agrees with Spence's observations—to a point.

"Golf course standards today are near perfection," Cadenelli says. "But they are geared more for appearance than the needs of the plant.

"Our management practices are now being challenged by a fragile environment. Obviously, things must change. New standards...more in tune with practical and economic realities...must be developed."

Spence and Cadenelli both agree that there's a problem, and it could be getting worse. The solution may be to change public expectations about the look of our nation's golf courses.

"I don't think we relinquish all control and turn over our GCSAA cards to Mother Nature, though," Spence contends. "An

occasional blemish or randomness should not be criticized—just recognized."

Cadenelli's reference to "economic realities," with the recent news from the *New York Times*, really hits home. According to the *Times*, "at least 10 percent of 2,600 residential developments centered on golf courses are in some sort of financial distress."

This puts maintenance dollars—most particularly for those golf courses in struggling residential developments—in jeopardy.

If superintendents are *forced* to cut costs, the golfing public may be *forced* to change its expectations concerning the appearance of golf courses.

"In the future, management inputs will change drastically," Cadenelli contends. "The decision-making process will become increasingly complex, and the future of the game will depend on the superintendent's ability to make solid decisions."

Cadenelli defines quality as species plus input plus technology times the ability of the golf course manager. What he's really saying is that, if input decreases, species or technology or the manager's ability must increase to keep the same quality.

Or, there's the "Spence Alternative" (sounds like a Ludlum book, doesn't it?): educate the public, help golfers accept lower standards that are more compatible with current environmental and financial considerations.

Which will it be? Either way, as Cadenelli says, "The professional golf course manager *must* face the new world with new thinking."

*Jerry Roche*



# LANDSCAPE MANAGEMENT

INCORPORATING LAWN CARE INDUSTRY

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## COVER FEATURE

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● Planting is the first step in root management that will lead to long and healthy tree life.

*Kim D. Coder, Ph.D.*

● To get a newly-planted tree off to a strong start, put a 3- to 5-inch layer of mulch around its base, says Mark Timmons, a horticultural consultant.

### 28 LM Reports: Golf course mowers

Golf course mowers come in many shapes and sizes. Here, we focus on reel mowers for greens and tees, and both reel and rotary mowers for fairways.

*Terry McIver*

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A thorough costing and documentation system will provide a solid base for managing and controlling your business.

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*Steve, Suz Trusty*



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*F. Brian Smith*

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Growing your company includes 'growing' employees. When you have them tracking their careers, the employees and employer both win.

*E.T. Wandtke*

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To be effective, a golf course or park sign must meet five basic requirements by using text, symbols, colors and shape. Here are your options.

*Arthur H. Mittelstaedt, Jr., Ph.D.*



### 62 Disease control strategies

● What's new in cool-season diseases for 1992, and how to control them, from Penn State University.

*Peter Landschoot, Ph.D.*

● Florida researcher updates the guide to warm-season disease control tactics she wrote for us last year.

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New seeded zoysias will fit in because of lower prices and even lower management requirements.

*Jerry Roche*

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Lauren Lanphear and Phil Fogarty 'put their money where their mouths are' on a radio program devoted to good advice and good fun.  
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The challenge, says Tim Doppel of Atwood Lawn Care, Sterling Heights, Mich., is for lawn care company owners and managers to develop *responsible* training programs.  
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# ASK THE EXPERT

DR. BALAKRISHNA RAO



## Choosing the right chain saw

**Problem:** The Florida Department of Transportation would like your assistance in locating a supplier/manufacturer of an electric-powered chain saw for use in overhead limb trimming. We have specs for air, hydraulic and gasoline-powered equipment, but would like to have a demonstration of an electric-powered saw. (Florida)

**Solution:** Greg Mazur, Davey's technical advisor for utility services, says Homelite and Stihl have light-duty electric chain saws.

Homelite has models EL12 and EL14; Stihl has models E14 and E20. The numbers indicate bar length. Mazur also says Sears carries the Craftsman line of electric chain saws. Contact local dealers for demonstration.

Electric-powered chain saws will not be very practical for overhead limb trimming. If not impractical, it would be very difficult and unsafe to have electrical cords attached to the saws and power source. The saws on the market require some sort of power source either from nearby buildings and/or mobile generators. I have not seen cordless electric saws designed for pruning.

## Drain tube not a bacterial cure

**Problem:** Does the drain tube cure wet wood bacteria? (Pennsylvania)

**Solution:** Installing the drain tube does not cure the bacterial problem. However, the drain tubes can help the trees overcome the problem.

Trees having wet wood disorder suffer from gas produced by the bacterial fermentation of sap inside the trunk. As a result, sap may ooze out from openings on the trunk. Affected trees will show undersized off-colored leaves and a thin crown. A properly installed drain tube can help the tree to overcome the gas build-up inside.

There is no fungicide treatment for wet wood disorder. Provide proper watering, fertilizing, mulching and pest management as needed to help improve plant health.

## What, how to seed

**Problem:** In recent years, we have been doing lots of lawn seeding. Which tall fescue varieties would you recommend for use in our area? Would you also please make comments regarding seeds and seeding method. (Pennsylvania)

**Solution:** Use a blend of at least three cultivars. When choosing cultivars, check the results of the National Turfgrass Evaluation Program, which can be found in the "Pocket Seed Guide" mailed with the July, 1991 issue of this magazine, or in the upcoming July issue.

Make sure that you get a certified seed having good percentage germination. Try to use current year's seed for better results.

An important factor in proper seeding is to maintain soil-to-seed contact. It is difficult to achieve this in lawns having heavy thatch. Ideally, lawns with greater than one inch of thatch should be dethatched prior to seeding. Yearly aeration may minimize the

thatch build-up problem if the thatch is less than one inch thick.

As far as seeding methods on established lawns, one method would be to spread seeds after aerifying. With this approach, seedlings may emerge in clumps from aerification holes. The seeds deposited on other areas in the lawn may or may not establish well because they are not in contact with the soil.

Another method is to use verticutting equipment such as a verticutter or a slicer/seeder, and then seeding. Most commercial people prefer a slider/seeder (aeroseeder) which will slice the ground and drop the seeds in the groove in one operation. This method is better, in that it will allow the seed-to-soil contact. This method can also be used to perform no-till renovation. Unless seeding into an existing lawn of fine-leaved tall fescue, the existing vegetation should be first killed by treating with non-selective herbicides such as Roundup. Seed after waiting for seven to 10 days.

After dethatching lawns with heavy thatch, you can use any of the above methods to renovate a lawn. However, the slicer/seeder method would give better results.

Because of excessive thatch in some situations, the sod may have to be stripped first. In this case, prepare proper seeding bed by tilling and raking. Then spread one-half of the recommended rate of seed in one direction and the other half in another direction. Gently drag a leaf rake to ensure seed-to-soil contact. Then spread straw over the seeded area. Keep the seeded areas moist but not wet during germination and establishment.

## Biocontrols for bagworms

**Problem:** Are there any biocontrol programs we can use to manage bagworms on evergreens? Sometimes we also see the bagworms on other plants such as honeylocust. What would you recommend, and when is the best time to provide treatment? (Pennsylvania)

**Solution:** You can use *Bacillus thuringiensis* (B.t.). It can be purchased under the names Dipel, thuricide or Foray. Reportedly, Novo Foray B.t. has slightly longer residual activity than other products.

These bacterial biocontrol products can be sprayed onto trees.

The bagworm can attack both the evergreens and deciduous trees. They can be found on plants such as junipers, arborvitae, spruce, linden, pyracantha, crabapples, bald cypress and honeylocust. If the problem is not severe, hand-pick the bags and destroy them.

It is important to inspect susceptible plants during May and June and spray when the bags are 1/4 inch long or less. After treatment, periodically monitor the bags for insects inside the bags. If the larvae are still present, re-treat.

*Dr. Balakrishna Rao is Manager of Technical Resources for the Davey Tree Co., Kent, Ohio.*

*Questions should be mailed 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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In the South, where weeds are a problem most of the year, you don't get much of a break from using herbi-



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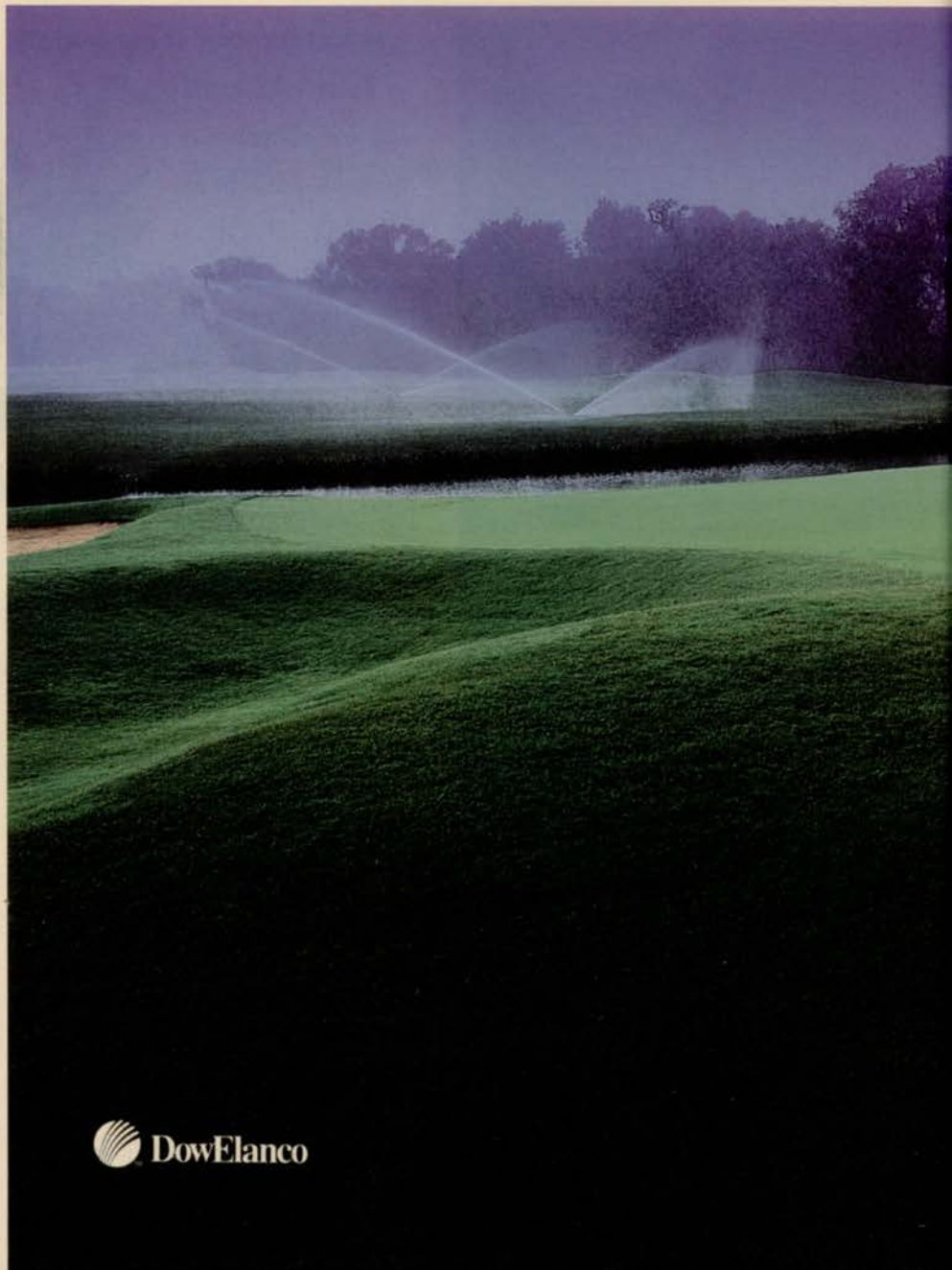
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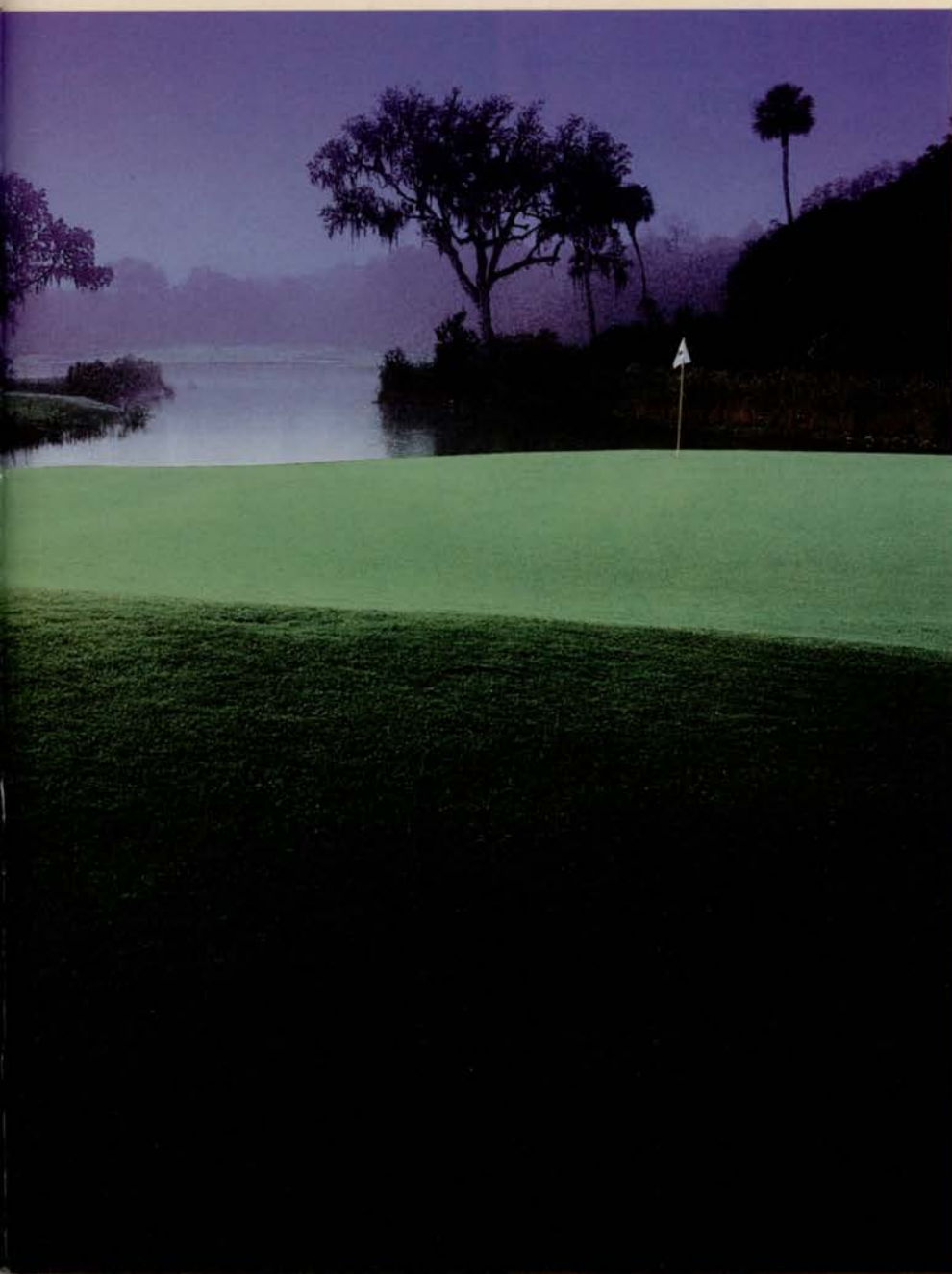
or flowers. Surflan is available as a sprayable and on fertilizer. If you prefer a granular form, there's XL\* herbicide (it contains the same active ingredient



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You can put it down at the full rate, or use split applications to spread the load over the season. Either way, you'll get good results.

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Goosegrass



Crabgrass

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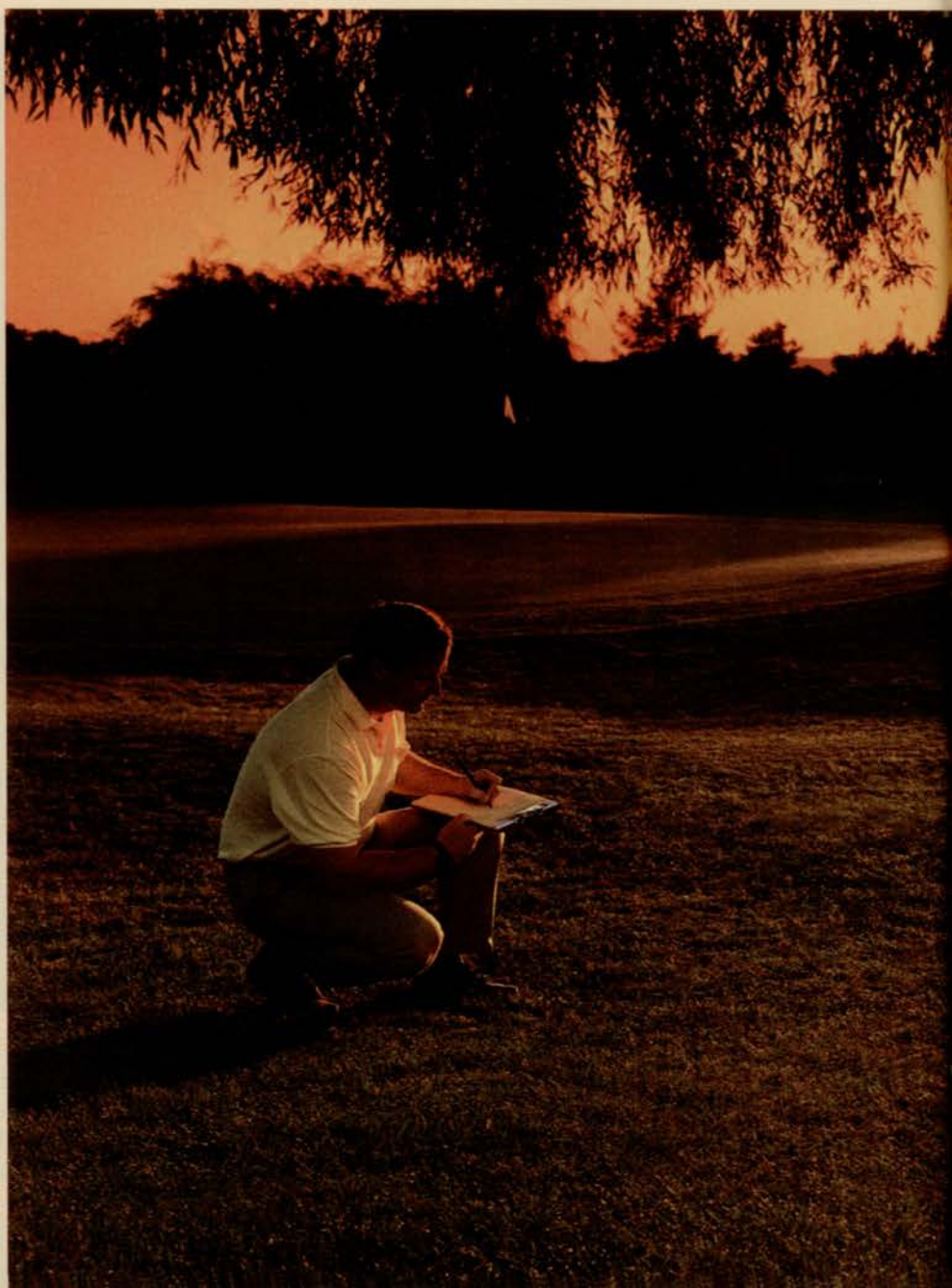
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*Rubigan and Broadway last longer than other fungicides, so you don't have to apply them as often.*



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**The chemistry is right.™**

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What you're looking at is a way to go an entire season on a single herbicide application—a control zone in the top inch of soil that keeps weeds from

one application gives you up to eight full months of control. If you like what Surflan does, but prefer a granular form, you can use XL\* herbicide. It



*Surflan is so mild it can be applied over the top of delicate ornamentals.*

our 40-page book, The Nursery And Landscape Guide To Responsible Pest Management. It also contains information on better ways to con-



# Actually, the mo this picture is contai

germinating all season long. It can greatly reduce your use of post-emergence herbicides and hand-weeding in your ornamentals.

contains the same active ingredient as Surflan. Apply it in the spring, and you'll get a full season of broad-spectrum grassy weed

### How To Make Your First Roundup Your Last Roundup.

Here's a way to make your first application of Roundup herbicide last all season. Mix 3 oz. of Surflan per 1000 square feet with ¼ oz. of Roundup per gallon of water and apply when weeds are less than 6" tall. Roundup will knock the weeds down, and Surflan will keep them from coming back for the rest of the season.



We have three different pre-emergence herbicides that make this possible. All of them are very gentle on your plants. And they bind tightly to soil particles, which makes them very resistant to leaching.

If you're looking for grassy weed control, you can use Surflan\* preemergence her-

control.

And for woody ornamentals, you can use Snapshot\* herbicide. It controls both grassy and broadleaf weeds. A single application lasts up to eight months. And it's available as a sprayable or in a granular form.

We can show you lots of ways to control weeds more safely and effectively. They're explained in



*Our preemergence herbicides set up a gentle control zone that keeps weeds from germinating all season.*

bicide. Surflan is, in fact, so gentle that you can spray it directly over the top of delicate ornamentals. Yet







control insects and diseases.  
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Because you don't need a lot of her-  
bicide to get beautiful results.

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 Warm Turf  
 Landscape and Nursery  
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# st beautiful thing about ned in the top 1" of soil.





You might think using less insecticide means you'll have to put up with more insects. But that's not necessarily the case. Because *how* you use your insecticide is as important as *how much* you use. With

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

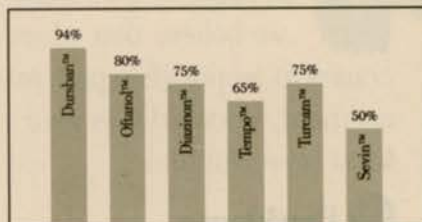
ornamentals by about fifty percent. Insecticidal soap controls most soft-bodied insects and mites. By adding insecticide, you'll also take care of tougher insects, like scales and worms. University studies



# A few ways to balance with your love for the environment







Studies show that Dursban delivers better chinch bug control at lower rates than other insecticides.

suggest you may get better control than you get with insecticide alone.

Knowing exactly when to apply insecticide helps, too. For example, adult black turfgrass aetiniid are

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 ironment.

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-

### Why Adults Should Spend Time Catching Bugs.

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.



self can also make a difference. After all, different insecticides work at different rates. Which is why Dursban<sup>®</sup> insecticide could be your best choice.

Just one pound active ingredient per acre controls chinch bugs, billbugs, sod webworms and a host of other insects. No other insecti-

have some questions. That's why we created The Turf Manager's Guide To Responsible Pest Management. It's 44 pages packed with information on the latest techniques for

controlling insects, weeds and turf diseases.

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Send me the following Management Guide(s):

- Cool Turf  Warm Turf  
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**The chemistry is right.<sup>™</sup>**

Dursban is available in liquid, dry flowable, granular and fertilizer formulations. <sup>®</sup>Trademark of DowElanco.  
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What you've read on the preceding pages only begins to outline a responsible pest management program.

You'll find a lot more in our guides to responsible pest management (see

coupon on previous page), and in the literature listed below.

If you have questions on our products, call one of our technical specialists at 1-800-352-6776. We'll be happy to help you out.

Because at DowElanco, we believe that when it comes to responsible pest management, knowledge is your most powerful tool.

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The chemistry is right.™

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# If we've piqued your interest, keep reading.

The literature below is some of the best information you can get on responsible pest management. Check your state university or write the publisher to find out where it's available.

## SUGGESTED READINGS:

• *Insects That Feed on Trees and Shrubs*

• *Turfgrass Insects of the United States and Canada*

Cornell University Press  
124 Roberts Pl.  
P.O. Box 250  
Ithaca, NY 14851  
607/257-7000

Orders to:  
P.O. Box 6525  
Ithaca, NY 14851  
800-666-2211

• *Lawn Care: A Handbook for Professionals*

• *Turfgrass Management*  
Prentice-Hall, Inc.  
15 Columbus Circle  
New York, NY 10023  
800-922-0579

• *Diseases and Pests of Ornamental Plants*

• *Introduction to Insect Pest Management*  
John Wiley & Sons, Inc.  
605 Third Ave.  
New York, NY 10158-0012  
212/850-6000

Orders to:  
Eastern Distribution Ctr.  
1 Wiley Drive  
Somerset, NJ 08873-1272  
908/469-4400

• *Complete Guide to Pest Control With and Without Chemicals*

• *Nursery and Landscape Weed Control Manual*

Thomson Publications  
P.O. Box 9335  
Fresno, CA 93791  
209/435-2163

• *Turf Management for Golf Courses*

Macmillan Publishing Company Inc.  
866 Third Ave  
New York, NY 10022  
800-257-5755

Orders to:  
Front & Brown Sts.  
Riverside, NJ 08075  
609/461-6500

• *Compendium of Turfgrass Diseases*

American Phytopathology Society  
3340 Pilot Knob Rd.  
Saint Paul, MN 55121-2097  
612/454-7250  
800-328-7560

• *Ornamental Insects: Recommendations for Managing Insects on Shade Trees and Shrubs*

Purdue University  
West Lafayette, IN 47907  
317/494-6794

• *Insect Phenology and Integrated Pest Management*

Journal of Arboriculture  
303 W. University Ave  
Urbana, IL 61801-1745  
217/328-2032

• *1991 Chemical Weed Control in Commercial Nursery & Landscape Plantings*

Ohio University PR.  
Scott Quadrangle  
Athens, OH 45701  
614/593-1155

Orders to: C.U.P. Services  
Box 6525  
Ithaca, NY 14851  
800-666-2211





# Proper tree planting techniques

## Proper planting is the first step in root management.

by Kim D. Coder, Ph.D.,  
University of Georgia



■ Getting shade trees and street trees started correctly is critical to long tree life, easy care and low-cost maintenance.

One way to ensure that trees are planted correctly is to give them plenty of room to grow; don't plant trees in spaces too small for their mature size. The amount of space required varies with soil conditions, site stress levels and species of tree.

Good planting allows a tree to colonize a site and positions tree roots where they can grow well. The soil environment must contain adequate space and essential materials to the roots. Planting is the first step in root management.

**Site selection**—Select the area for planting based on the growth characteristics and biology of the tree species, the size of the area it will occupy when mature, the presence of potentially damaging conditions (like overhead or underground utility lines), and functional and aesthetic design, *in that order*. Thousands of trees die every year when tree biology is an after-thought of the design process.

**Rooting space**—The amount of rooting space needed by a tree depends primar-

ily on its mature size, the expected amount of stress the tree will be under, and management input. Soil texture, aeration of the soil, and the amount of surface area of the soil open to the air are also considerations. Calculate rooting area (see sidebar).

**Planting area treatment**—The planting site should be an area at least 10 times the diameter of the initial root spread or rootball of the tree. The entire planting site should be tilled or spaded as deeply as possible (at least eight inches). On badly compacted sites, sub-soiling, aeration and deep tilling (16 inches) may be required.

Do not incorporate organic materials like peat or manure into the soil; they should be added as mulch. Adding materials that will change soil texture will disrupt soil water movement. Also, do not till or dig in areas where other tree roots already exist.

Test the soil to determine the level of essential elements, pH, and potential productivity. pH should fall between 5.8 and 7.0 for most native trees. Dolomitic limestone can be added to raise pH in highly acidic (low pH) soils. High soil pHs (cement wash areas) lead to elemental shortages.

In areas where rooting is limited and tilling is not possible, it is important to provide as much soil space as the site permits for tree roots. Allow as many square

feet of open soil surface as possible in tree wells, containers, parking lot areas or tree lawns. Ideally, at least 100 sq. ft. of open soil surface is needed for long-lived, healthy trees.

**Hole shape**—The actual planting hole, placed in the middle of the planting site, should have a compacted soil pedestal and steeply-slanted sides.

The rootball should rest on a compacted soil pedestal in the bottom of the hole. This soil pedestal can be compacted with your foot since the roots are going to spread outward, not downward. The pedestal will encourage root spreading.

The tree should be positioned to rest at the same level in the soil as it did in the nursery. You can tell where the old soil level was by looking at the stem base. In heavy textured soils (clays), it is better to plant trees one inch too high than to plant trees one inch too low.

Planting hole sides should never be vertical (straight up and down). They should always be slanted at least 45° from the ground surface. Slanted hole sides



allow and encourage roots to spread out and grow into native soil. In limited rooting areas, slanted hole sides can help prevent the tree from becoming pot-bound in the hole.

**Hole size**—The diameter of the planting hole should be at least three times the diameter of the root ball. The hole must be large enough to allow for proper root growth and distribution. Do not bend or pack roots into too small a hole.

**Tree placement**—Do not put water into the hole before the tree is planted. You should water the root ball heavily after planting.

Remove the tree from all bindings, ties, wires, burlap or wrapping. For larger trees, it is important that you remove all ties and as much of the packaging material as possible.

Do not leave trees in wire baskets or surrounded by any other kind of material or fabric. Any materials left around the tree will disrupt root growth and affect long-term root distribution.

Tree wrap can be used to protect the tree during the planting process. But it should be removed immediately after the planting site is finished.

**Tree planting**—Tree roots should not be exposed to full sunlight and air for more than a few seconds. Immediately upon opening the container or wrapping, use your fingers to gently pull the outer roots away from the rootball.

Gently break up and disrupt the nursery soil around the roots. Place the tree in the hole and carefully backfill with the native soil. Do not add any type of soil amendment or fertilizer to the native soil fill or the hole.

Try to keep the roots in roughly their original orientation. Do not sharply bend, abrade or twist them. Pull apart or cut roots that are closely surrounding or girdling the stem base. Plant trees with their roots spread horizontally, not downward.

Snugly pack the soil around the roots. Eliminate large air pockets but do not tamp or compact the soil. Roots must have close contact with the soil in order to properly function.

After the tree is planted, extensively water the entire planting site to help settle the soil and minimize large air pockets. Extensive watering helps establish connections between the tree and the soil-water system.

—The author is in the Extension Forest Resources Department at the University of Georgia.

## Calculating rooting area

**Step 1:** Use the following chart to estimate what the size of the trunk at 4-1/2 feet above the ground (diameter at breast height, DBH) will be, at the age shown for the expected stress level.

<u>Site stress levels</u>	<u>Est. dia. of tree at age:</u>	<u>Example areas</u>
extreme stress	7 yrs.	downtown, parking lots
moderate stress	15 yrs.	residential streets, intensive use parks
low stress	25 yrs.	yard trees

**Step 2:** Expected DBH (in inches) x 2.0 = side dimension of a square planting space (in feet) or  
Expected DBH (in inches) x 2.25 = diameter of a circular planting space (in feet).

**Example:** A 3-1/2-inch DBH tree in a parking lot would be growing in a very stressful site. Expected diameter (DBH) in seven years is five inches. The amount of rooting space you should provide at planting time for this tree would be a 10 x 10 foot square area (5" DBH x 2.0 = 10 feet) or a 11.25-foot diameter circular area (5" DBH x 2.25 = 11.25).

## Mulch for trees: wide but not deep

■ To get a newly planted tree off to a strong start, put a 3- to 5-inch layer of mulch around its base, says Mark Timmons, a horticultural consultant.

Timmons says work done by Dr. Gary Watson at the Morton Arboretum near Chicago shows that mulched trees develop significantly faster than non-mulched trees under the same conditions. Timmons says the mulch moderates soil temperatures and moisture for the tree roots.

Be careful not to apply the mulch too deeply, but don't worry about making too large a circle of mulch around the tree base.

"The guys that thought up the word dripline didn't do us a favor," says Timmons, explaining that many turf managers make the mistake of thinking almost all of a tree's root system lies within the imaginary circle beneath the tree extending straight down from the circumference of the tree's foliage.

He says that many tree

roots radiate out much further than that, sometimes 2 or 2 1/2 times the height of the tree.

"The root system of a tree is almost always more extensive than the tree canopy," says Timmons.

Another common misconception concerns tree taproots, says Timmons of Mark Timmons & Associates, Louisville. "Most trees as they mature lose what rudimentary tap root that had when they were young," he says.

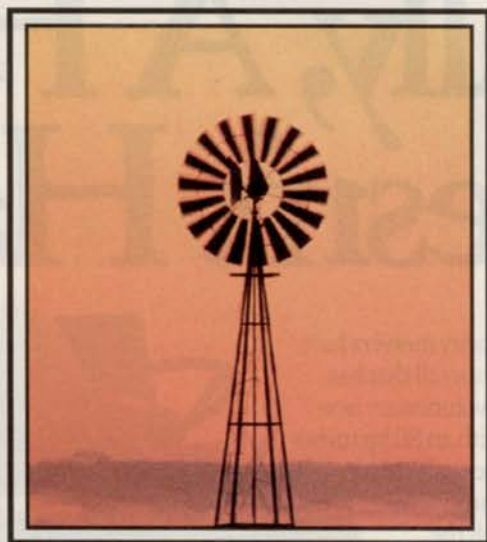
This is particularly true when a tree is growing in heavy clay soil. There isn't much oxygen in these soil, and what little there is is within the top 18 inches of soil.

Timmons, who consults with turf/landscape managers and golf course superintendents in the Midwest, made these comments at the 1992 Golf Course Superintendents Association of American Convention this past February.



**Mark Timmons says tree root systems can be amazingly extensive.**





Granular control for broadleaves.  
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which way  
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# Finally, A High Capacity Mower That Doesn't Handle Like One

For too long, high-capacity mowers have left a lot to be desired. But now all that has changed. Presenting the revolutionary new Groundsmaster® 580-D with an 80 hp turbo-diesel engine. The first large-scale rotary mower that combines the productivity of a 16-foot machine with the handling ease of a smaller mower.



Operating the 580-D is incredibly easy. Only Toro provides an adjustable tilt steering wheel and column. All controls are at the operator's fingertips, even cruise control.

Transport is easy too. An exclusive rotating hinge lowers the outboard cutting units behind the operator for a clear view to the side and rear. A balanced design allows you a stable 20 mph transport speed because the weight of the outboard cutting units is rotated to the rear.



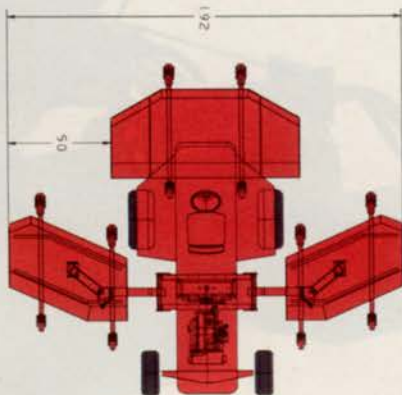
Digital read-outs display vital engine/machine functions at the touch of a button.



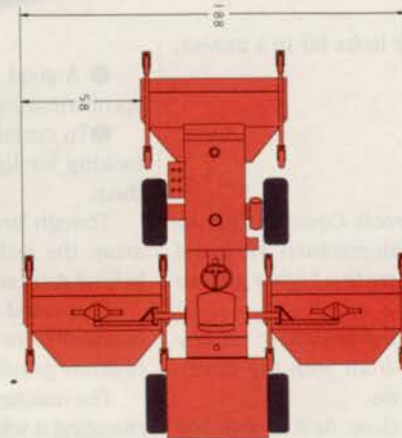
# Capacity Mower That Like A School Bus.



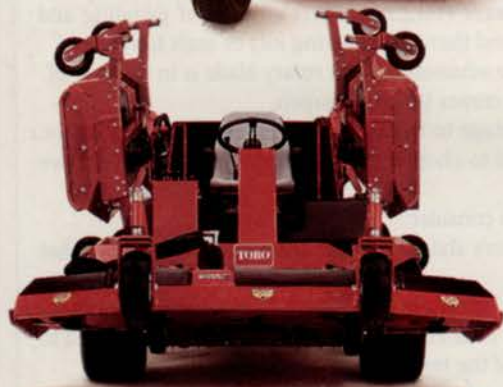
Toro's outboard cutting units also include an exclusive break-away protection feature. Should the operator misjudge distance, the wings will pivot away from the object that has been hit.



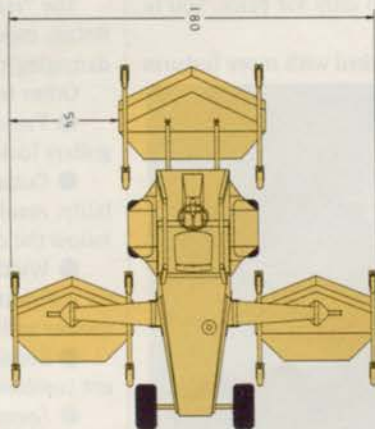
The 580-D's wide stance and short wheelbase give it maneuverability and stability. A short 76" wheelbase lets you turn an 18" uncut circle without braking. And Toro's exclusive swept-forward wing design keeps the tips of the outboard cutting units in line with the front drive wheels improving operator control and visibility.



For even more versatility, the 580-D includes these accessories: an 8-foot front broom attachment, a roll over protection system, a canopy, a cab and a road light package.



Another Toro exclusive allows you to raise one or both of the outboard cutting units inside the traction unit width. The 580-D can then trim between objects less than 8 feet apart with the 92" Triflex® cutting unit.



If you've been sacrificing ease of operation for high capacity, it's time you saw the revolutionary machine that gives you both: the new Groundsmaster 580-D from Toro. Call your local Toro distributor to see the Groundsmaster 580-D or contact Toro at the address below. You'll see firsthand how productive and versatile large-scale turf mowing can be.

**TORO**

The Professionals  
That Keep You Cutting.



# Golf course mowers loaded with features

**Shopping for the right golf course mower can be confusing. Make your mower search easy. Prioritize your needs.**

■ Ask a golf course superintendent what he looks for in a mower, and he'll most likely say:

- 1) quality of cut;
- 2) longevity;
- 3) durability; and
- 4) low maintenance.

Mike Mongan, superintendent of the Arcola Country Club in Paramus, N.J., wanted a mower that cuts with precision. He found one, and credits the unit with taking the course to a higher plateau of professional appearance.

Another important feature won't be found anywhere on any mower you test ride. It's called "service"—from both the dealer and the manufacturer. And finally, there's price.

Price comes last? If not dead last, pretty close. As it is with any important purchase you make, if you shop only for price, you're gonna get burned.

Today's best golf course mowers are packed with more features



Jacobsen's Greens King IV



◀ Toro's Greensmaster 3100

than James Bond's Aston Martin (though we have yet to see a model that comes with oil slicks or machine guns).

- In response to the growing concern over grass clippings disposal, some manufacturers now offer mulching blades, which chop the clippings into virtual non-existence.

- Larger mowers are packed with improvements in the drive train, braking system and hydraulic controls.

- Rotary mowers can also come with large hoppers for catching the clippings.

- A good, responsive rough mower will eliminate extra time spent trimming around trees in rough areas.

- To curtail compaction on greens, more superintendents are looking for lightweight units, and manufacturers are providing them.

Though large gang-reel mowers are often used for large fairway areas, the reel blade does require more maintenance. Most pull-behind gang reels mowers require at least one rebuild each year.

"I've saved \$4000 to \$5000 using rotary mowers in roughs as opposed to reels," says Mongan. "There's no relief grinding and bedknife grinding; and there's no bearing kits or seals to replace."

The maintenance advantage of the rotary blade is in the ease of changing it when it comes time to sharpen.

The "real" advantage to the reel mower is in the quality of cut. Rotary mowers tend to chop at the leaf blade, resulting in a more damaging cut.

Other features to consider:

- Fairway mowers should provide the consistency of cut that golfers look for.

- Cutter decks: better air flow means better vacuuming capability, resulting in a cleaner finish; "floating decks" are designed to follow the contour of the terrain.

- Width of cut and suspension are also important, depending on individual needs; to make the most of your mowing time, get a mower with a deck that's at least 48 inches wide.

- Some cutting units can be operated individually or in different combinations.

- Speed: important, considering the wide areas you'll be cutting.

—Terry McIver





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# Dependable, economical post-emerge control

# **Crabgrass, Nutsedge**

## Plus the truly hard-to-control broadleaves

Read how Trimec® Plus, with its unparalleled broad spectrum control, fast action, and gentleness to desirable grass, is helping turf professionals improve their

**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 pro active 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 pre-emerge broadcast 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 pre-emerge. "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 treatment is a major factor in our program," says Albrecht.

But if Trimec Plus is ideal for spot treatment, it is also unsurpassed for broadcasting 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 a broadcast 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.

### What is Trimec® Plus?

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.

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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816-421-4070

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HERBICIDE 758-292



# GOLF COURSE MOWERS\*

## REEL MOWERS

Manufacturer	Model	Engine	Width	Cutting Height	Cutting Accessories	Circle No.
Brouwer	5 & 7-gang	PTO	138"/192"	3/4"-3 1/4"	Hydraulic lift to raise mowing units	300
Bunton	5-gang fairway mower	Onan 20-hp or Kubota 22-hp	100"	1/4"-3/4"	Outboard reels raise and lock	301
John Deere & Co.	305 Hydraulic	540 RPM PTO	142"	3/8"-2 3/8"	Grooved front rollers; rear rollers/scrapers	302
	3325 (5-gang)	Yanmar diesel 38-hp	138"	3/8"-3"		303
Jacobsen Kubota	LF-100	Kubota D950, 3-cyl.	100"	1/4"-3/4"	Fairway turf groomer	304
	Verti-Reel	L3250F tractor	15' 6"	3/8"-3"	Hand-adjustable bed knife	305
Lesco National	5-7 gang reels		11' 2"			
	500D	Kubota diesel; 22-hp	100"	1/4"-1 3/8"	6-, 8- or 9-blade reels	306
	Triplex 84	Briggs & Stratton Vanguard	84"	1/2"-2"	Optional winch to raise reels	307
Ransomes	220 M28-4WD	Kubota 3-cyl; 28-hp	84"	1/2"-2"	Hydrostatic drive for automatic positive braking	308
Toro	Reelmaster 223-D	Mitsubishi diesel	95"	1/4"-5/8"	Five or eight cutting units	309

## ROTARY MOWERS

Manufacturer	Model	Engine	Width	Cutting Height	Cutting Accessories	Circle No.
Bunton	Hydrostat	Briggs & Stratton 18-hp Vanguard	61"	1"-4"	Instant forward/reverse	310
Jl Case	60MS	Mid-PTO drive	60"	1 1/2"-4"	Three blade spindles	311
Cushman	Model 810	Kubota diesel, 3-cyl.	60"-72"	1"-4 1/2"	All-hydraulic drive	312
John Deere & Co.	F915; F932; F935	Yanmar 17-28 hp	60"-76" decks	1 1/2"-4"; 1"-6"	Anti-scalp rollers	313
Dixon	ZTR 503 HG	Kohler 20-hp	50"	1 1/2"-4 1/2"	Hydrostatic/hydro gear	314
Encore	Pro-Line 48/60	Briggs/Kawasaki/Kohler/Honda	48"-60"	1"-4"	3 cutting blades	315
Excel	Hustler out-fronts	Gear box spiral bevbel gears	60"-72"	1"-5"	Range Wing attachment cuts a 12' swath	316
Exmark	Turf Tracer 5-spd.	Kawasaki 14-hp or Kohler 18-hp	52" or 60"	1 1/2"-4 1/2"	Five-speed transmission	317
Ferris	H1618B	Vanguard 17-hp	48"-52"	1 1/2"-4"	Patented electric lift	318
Ford New Holland	CM224/CM274	Liquid-cooled diesel	60"/72"	1 1/2"-4 1/2"	Independent brakes	319
Grasshopper	700 Series	Briggs & Stratton; Kohler; Onan	48"-72"	1"-5"	Dual hydrostatic direct drive	320
Gravely	Pro Master-G	Kohler, 20-hp	50"-60"	1 1/4"-4 3/4"	Filtered hydraulic reservoir	321
Honda	HRC7013ZXA	Honda 13-hp	36"-48"	1 1/2"-5 1/2"	Twin hydraulic drive pump and motor system	322
Howard Price	Turf Blazer 1260	Yanmar Diesel	72"	1"-5"	Four-wheel drive optional	323
Jacobsen	HR-5111	Kubota 4-cyl.	134"	1"-5 1/2"	Hydrostatic transmission	324
Kubota	FZ2100	Kubota 20-hp	54"-60"	1"-4"	Zero Diameter Turn; auto assist differential	325
Lesco	52" Commercial	Kohler Magnum 20-hp	52"	1"-4 1/2"	Dual articulating decks	326
M & W Gear	Lawn Clipper	Briggs & Stratton Kohler	42"-62"	1"-4"	11-bushel hopper	327
Ransomes	XT6150	Kubota diesel 51-hp	61"-117"	1"-4 3/4"	Tilt-wheel, hydrostatic steering	328
Simplicity	CFC Series	Briggs & Stratton Vanguard or Kohler Magnum	46"-66"	1"-4"	Dual hydrostatic infinitely variable transmission	329
Steiner	Model 425 Super w/MD472 deck	Onan 24-hp	Deck: 72"	1"-4"	3-blade rotary mower	330
Toro	Gr'ndsm'ster 455-D	Peugeot 4-cyl.	54"/90"/126"	1"-5"	Patented Traction Plus weight transfer system	331
Woods	5250	Kubota 24.5-hp	52"	1"-4"	Dynamic braking; hydrostatic transmission	332

## GREENS MOWERS

Manufacturer	Model	Engine	Width	Cutting Height	Cutting Accessories	Circle No.
Bunton	Walk-Behind	Wisc. Robin 3.5-hp	22"-26"	5/32"-13/32"	Powered rotary brush	333
Jacobsen	Greens King IV	Kohler 16-hp gas	62"	3/16"-7/16"	1/8" cut with low profile bedknife attachment	334
John Deere & Co.	2243	Kubota 16.5-hp diesel	22"	3/32"-3/4"	Hydrostatic transmission	335
Ransomes	Greens 3000D	Kawasaki FD 590V	22 3/4"	1/8"-1/2"	Hydrostatic braking	336
Toro	Gr'nsmaster 3100	Vanguard V-59" Twin cylinder	59"	1/8"-3/4"	Turf Guardian leak detector	337
Lesco	300/300D	Kohler Magnum 18-hp	60 3/4"	1/8"-1 1/16"	Reversible hydraulics, cutting units can be back-lapped	338
		Kubota D650 16-hp				

\*Models are representative of company products; other models may be available.



# Pricing the takeoff

## Part III of III: A thorough costing and documentation system will provide a solid base for managing and controlling your business.

by Sylvia Hollman Fee

■ Pricing an estimate is the final step before placing the proposal before your client.

Takeoff lists are prepared for hard construction, site work, plantings, irrigation, and so on. Each major category is kept separate in the methodical takeoff listing.

Fig. A refers to square feet, linear feet and cubic yards because those are the reasonable dollar value units of measurement. These units of measurement will also refer to the corresponding labor required for installation.

In the hard construction takeoff (Fig. A), the estimator's common sense confirms related quantities such as the concrete slab and the surface stone paving. A variance in height of the railroad tie wall has been noted and measured.

Once all the work has been identified and listed, prices are added to the takeoff.

Your most accurate price source is your firm's historical cost data from past projects. Other sources are local suppliers and subcontractors and annual cost data publications.

ing man-hours, crew requirements, material, equipment and total costs. Using one (or all) of the three sources mentioned above, calculate the estimated cost of each item, and fill in the cost in the appropriate column on your estimating sheet.

The next step is creating a summary and total. The summary can be prepared using a pre-printed form. Sales tax, overhead and profit provisions are calculated, and the whole estimate is totalled. Your firm's particular overhead requirements must be the basis for your mark-up.

**System costs**—It is common for experienced estimators to have an in-house price or system cost for certain kinds of routine work.

For example, if the bluestone terrace noted in Fig. A is a routine application, the contractor may carry a cost of \$14.50/sq.ft. for bluestone terraces. For lawns, a cost per square foot or square yard is a standard practice. In all pricing situations, common sense dictates adjustments in systems costs for any unusual site conditions or specifications.

### Pricing formats—

Several formats of bid pricing may be used or required by clients. The methodical takeoff method never varies in spite of the final form the bid price may take. Bid prices for work may be presented (or required) in certain formats. Most common are lump-sum bids and unit-price bids. Also, a combination of these two forms is not unusual.

**Unit-price bids:** In a unit-price bid, each item listed may be detailed in specifications or drawings to include material or methods that are unique and costly.

Cautions are advised on pricing unit-price

bids (sometimes called line-item bids). A methodical takeoff of all items contained within a unit-price bid list is necessary.

An example of unit prices that could confound your bid for lawns could be seeding as a unit price and loam as a unit price. This calls for an estimator to break up a system often priced as one unit.

**Lump sum bids:** It's not unusual for the landscaper to propose all site work, construction, planting and so on for one total price.

**Padding**—Padding (percentage mark-ups dependent on "uncertain events or chance") have no place in a quantity takeoff.

A solid estimate is based on a methodical takeoff list of all items that must be paid to complete the job.

Fig. B

Irregular areas, deliveries, taxes, overhead and clean-up should be thought out in advance and figured into your prices. They should appear as contingency items. If you don't know it, you can't project it.

If there are circumstances around a bid item that are uncertain, that concern may be handled by listing the item on the estimate with a dollar value attached.

Keep in mind, your cost items form a valuable base for the job budget at the time of installation.

—The author is owner of Sylvia Fee & Associates Inc. in Needham, Mass. and author of "Means Landscape Estimating."

On all of the takeoff worksheets accompanying this article, the arithmetic has been checked for accuracy, and the items have been reviewed.

Fig. A

Fig. B is a sample page from *Means Landscape and Site Work Cost Data* show-



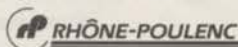


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## Tips from the pros on marking athletic fields

by Steve and Suz Trusty

**Stripes and lines should be attractive, easy to use and maintain, within the budget, and long-lasting.**

■ This is the time of year when you'll be making your choices for striping and lining your baseball, softball, soccer and football fields.

Turf marking equipment includes low-pressure, hand-operated, compressed air sprayers; gas-operated piston pump sprayers; and high-pressure airless sprayers. Attachments include devices for forming soccer circles and arcs and extensions for freehand painting.

Sports Turf Managers Association professionals pass along these tips.

**Steve Wightman, Jack Murphy Stadium, San Diego—**

**1)** At the start of the season, measure accurately. Use a triangle to check right angles. Drive nails into the ground around the field perimeter, marking them with orange or yellow flagging. This way, you'll only need to measure once each season.

**2)** Locate flag points and stretch strings. A good, strong string is necessary. For parks departments and smaller schools, try to keep the lines at least four inches wide. To ensure accuracy, use an attachment to guide the sprayer along the stretched lines. A template can be attached to the sprayer to contain the spray within the desired pattern. Use a similar template for hash marks.

**3)** The field should be dry for spraying. Have a mixing area close by. Follow paint manufacturer's instructions, thickening the mix ratio as needed when cooler weather slows both drying and turf growth.

**4)** Make a 1/4-inch plywood template for numbers. To eliminate measuring steps and line up the numbers properly, position the bottom of the number template along the perimeter string.

**5)** Lower pre-season mower height to 1/16th inch below the normal cutting height. Mow again, on game day or before, to game cut. Alternate the grain in five-yard strips for football fields. Strive for uniformity.

**6)** Wightman spent 21 years with the Denver Parks System. Instead of painting, they used a special 8-inch-wide mower set to cut lines as a 1/8- to 1/4-inch height. Once lines are established, maintenance is

## Painting designs

■ David L. Westerman of Carbit Paint Co., Chicago, says the key difference between natural and artificial turf paints is that natural turf paints are semi-permanent, while the artificial paints are permanent. Because natural turf paints are applied to grass which grows out, they are designed to retain color through a couple of rains, but are destroyed when the grass is cut.

Old paint is removed with sweep brooms and high-pressure water.

On some artificial turf, multi-use fields, where markings must be changed frequently for different events, temporary dyes are applied which can be hosed off right after the games.

Painting can range from the basic lining/stripping to the fancy—for end zone and center-of-the-field decorations. Templates from plastic sheets are made for regularly-used designs.

Spray through dot-to-dot openings in the plastic to mark the outlines of the design. Then remove the template and fill in the dots.

To form the plastic template, project a slide image of the design on a 20-foot high wall. Line up the projector to the desired dimensions and make the cuts. For large decorations, multiple sections of plastic can be used and either fitted or hinged together for spraying.

## An alternative method

■ Safety-Line, from Oly-Ola Sales, Villa Park, Ill., is an alternative to athletic field lining/stripping.

It is a permanent marker constructed for player safety, made of soft, ribbed vinyl with a white, non-skid top. The marker is installed below the grass, at ground level, anchored by a 6-inch grooved fin that is further secured by a 9-inch steel anchor stake.

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relatively easy. The mowed lines can be chalked for special games.

**Ken Mrock, Chicago Bears—**

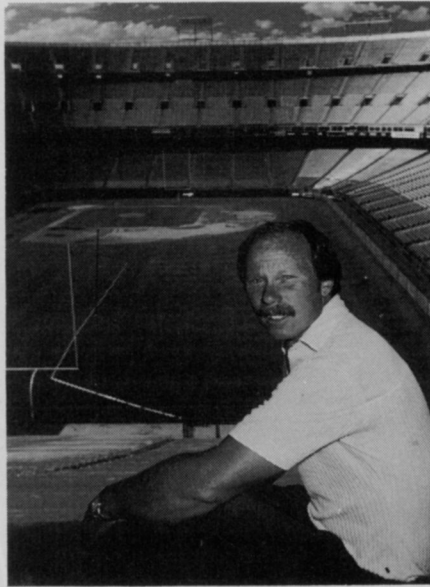
1) Use extremely low pressure when spraying paints. This method cuts drift, uses less paint, and allows the plants to grow before paint is applied again.

2) Lay out the normal football field and mark in white paint. To control turf wear, lay out a second pair of fields perpendicular to the first field and extending beyond it, using the 50-yard line as the divider between the two fields. The two perpendicular fields are marked with orange paint. This gives the team three fields or four separate quadrants for practice and spreads out the wear.

3) With limited budgets, mowing, chalking or glyphosate may replace painting.

**Bill Whirly, parks supervisor, Fort Collins, Colo.—**

1) Paint fields only in the spring and fall. To cut costs during the rest of the year, apply glyphosate with a sprayer. Mow



**Wightman: Strive for uniformity.**

the line areas to a height of 1-1/2 inches prior to painting or glyphosate applications. Since normal bluegrass height is

three inches, this leaves less leaf surface to contact.

2) Take care during glyphosate application to ensure the material does not affect turf beyond the desired line width. Whirly paints a 3- to 4-inch-wide line, but applies glyphosate to only one inch of turf to achieve the same result. Wightman suggests treating a 6-inch-wide strip of turf to create an 8-inch-wide line. The staying power of the glyphosate application will vary from one month to season-long, according to seasonal conditions and turf type.

3) For end-of-season playoffs, use semi-permanent paint. If fields still show post-season markings, those using them will play within the marked areas. When markings are not visible, the best sections of turf are chosen for play, reducing continual wear and compaction on the same spots.

—The authors are partners in *Trusty & Associates, consultants to the horticultural trade, headquartered in Council Bluffs, Iowa.*

## County extension and YOU

**In an attempt to do more with less, extension agents are opting to work more with landscape professionals and less with individual homeowners.**

by F. Brian Smith

■ As a landscape manager, you have many resources to choose from when you need help and assistance. You can turn to your local chemical rep, another landscape manager, equipment distributors and written literature like *LANDSCAPE MANAGEMENT*.

But have you ever thought of your local extension service?

Most people think of the county agent as someone who knows a lot about pigs and cows, but very little about horticulture. However, many extension offices have an agent who is very knowledgeable about turf, ornamental plants and their care. This is especially true in the urban areas where the ornamental horticulture industry is strong.

Even if the county agent you deal with does not have a strong horticultural back-

ground, he can access the extension specialist and faculty at your state's land grant college horticulture department. This very fact alone makes the local extension office and your county agent a broker for some of the most important sources of information.

An added plus for using your county agent is when you're dealing with homeowners or managers: they are more likely to believe you when you explain that your information comes from the local extension service.

Many state extension services have a plant problem clinic. This is a service that will take samples from those landscape problems that have you stumped and run them through the diagnostic lab at the college or university. From my own experience as a county agent working with landscape professionals, quite often when we think we have solved a problem, the plant problem clinic will send us results showing it was caused by a problem we hadn't discovered.

Still, these clinics aren't completely able to solve all the problems. They are dependent on the sample you send and the information you provide with the sample. Many times, it has taken the clinic's diagnostic procedures, our site analysis and some imaginative detective work to find

the real cause of the problem, and not just the symptoms we first notice.

If you've never called your extension office and spoken with the county agent, now is a great time. Federal and state budget cuts have severely hampered many state extension services.

Most states are ending their long-standing policy of taking phone calls from homeowners or going to individual homes.

In an attempt to do more with less, they are opting to work with landscape professionals and let them deal with individual homeowners. What this means for you is the people who had been calling the local extension office will now call you.

This situation also means the county agent is not as distracted with homeowners and can work more closely with you.

Lastly, a good working relationship with your county agent can be invaluable when those problems arise that you can't solve on your own, or when the homeowner or manager won't accept your answers.

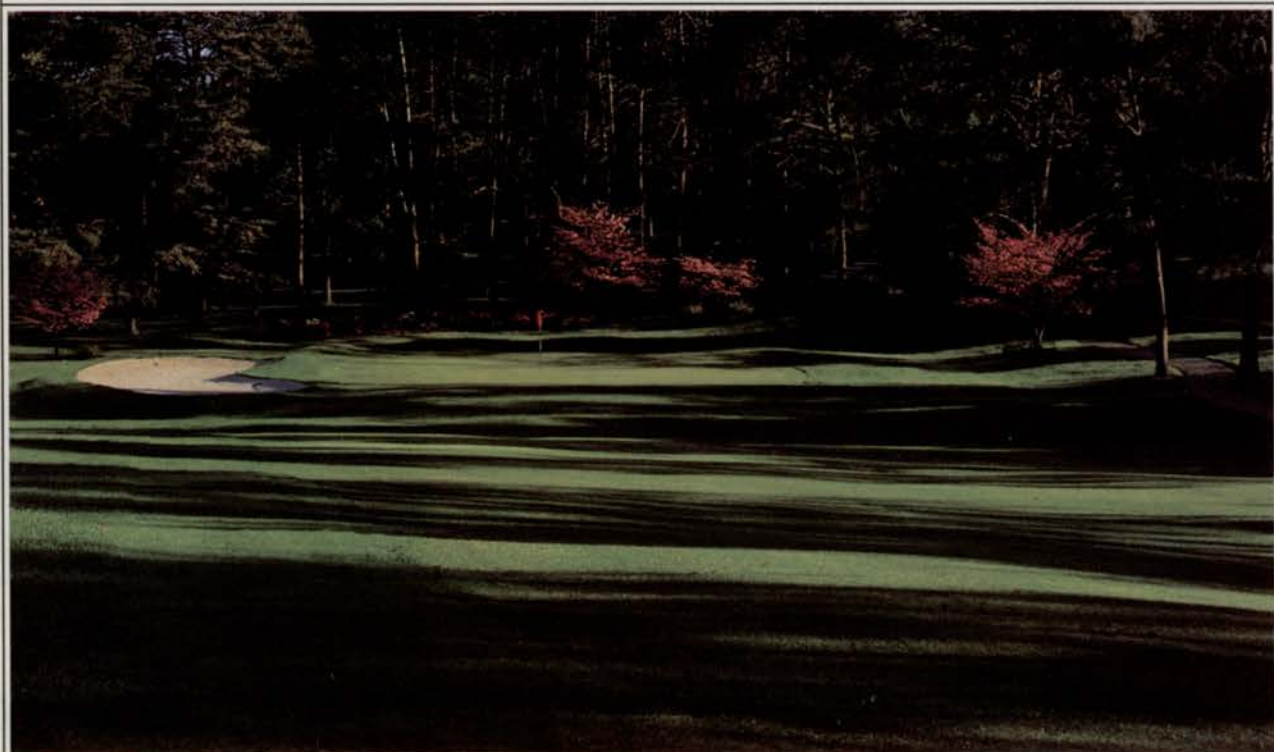
It makes the county agent's analysis easier when he is already familiar with you and your level of experience and work.

So start working with your county agent today. He might be able to help you solve that problem before it becomes a problem.

—The author is *Beaufort County Extension Agent for agriculture, cooperative extension service for Clemson University in South Carolina.*

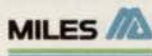


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# Small businessman's needs are met by D.C.-based group

## NFIB is indeed a national voice for small businesses in the U.S.

■ The National Federation of Independent Businesses, a Washington-based organization for the small businessman, is "an unheralded alliance of little guys," describes *U.S. News & World Report* magazine.

William Thornton Jr. of Thornton Industries, Maineville, Ohio, outlined in a letter to *LANDSCAPE MANAGEMENT* benefits of belonging to the NFIB.

"Your editorial 'The plight of the small businessman' (Dec., 1991) was right on track. You are absolutely right that the number of landscape and lawn care companies, like all small businesses in this

country, is increasing. Small business is where most of the new jobs are created. The small and independent business is the growing part of our economy.

"You are right about small business men and women working long hours. And because of their limited time, they should be involved in the events that enable them to do more than they could on their own. It is important to be involved in events like the PLCAA Legislative Day or the recent ALCA/AAN Legislative Conference, and make these contacts with our legislators.

"Recently, NFIB has worked hard on such issues as these:

- parental leave,
- civil rights,
- unemployment compensation benefits extensions,

"NFIB is indeed a voice for small busi-



**Thornton: there's help for small companies at the NFIB.**

ness in Washington, D.C. and all 50 state capitals. The NFIB position is that of small business owners because it is only determined by regular votes of its members."

Typical new member dues in the NFIB is \$100, which includes a subscription to *Independent Business* magazine. For more information, phone (202) 554-9000 or write: NFIB, 600 Maryland Ave. SW, Suite 700, Washington, DC 20024.

# Career tracking for valuable employees

## When your employees track their progress, everyone wins.

by E.T. Wandtke

■ Have you ever lost good workers to another organization, after they have been with you for a couple of years?

If so, did you consider why they left?

Over the years, I have heard many reasons why seasoned green industry employees have left their company. However, I still don't think the owner realized the true reason why the employee left.

Boredom...a change...unhappiness...not enough money—these are but a few reasons why employees leave an organization. But there *is* a way to stop this from happening!

**Symptoms vs. reasons**—To prevent this scenario, you must follow a few simple steps.

**1) Job description.** First, those "reasons" that employees leave are not truly reasons but symptoms of a lack of planning. What do I mean? Simple: you must anticipate what your employee's future needs will be, and make sure you find a way to meet these needs if you value that

employee. And the easiest way to start employee planning is to make sure you have a job description for each employee.

The job description should provide the employee with a blueprint to becoming successful in the company. List the skills the employee will need to do or to develop to do the job. Once a clear job description has been laid out, the employee now has something to shoot for.

**2) Career path.** Once you have established employee job descriptions, you must develop a career path for the employee to follow to reach supervisory and management positions. List the skills which you see as necessary for a supervisor or manager in your company. List the duties he or she is expected to perform and the responsibilities he or she will have. The key here is to tell employees exactly what skills and qualities you would like to see in an ideal manager.

**3) Employee development.** Now that you have developed a job description and a career path, listing the skills that are necessary to be acquired along the way, you are halfway toward developing a complete employee planning program.

The *employee* must:

a) Learn what is expected and the skills required. Often, this means only reading the job description.

b) Work to develop those skills which he or she does not possess. Skills necessary for advancement take time to master, but knowing what is required is half the battle.

c) Seek help if unable to master some of the tasks/skills required.

The *employer* has two additional responsibilities beyond creating a job description and developing a career path.

a) Recognize the skills that certain employees are lacking. This might seem obvious, but often when I ask, "Why won't Jim be a good manager?" I get: "I don't know" as an answer.

b) Provide a means for the employee to acquire the necessary skills. For example, I suggested one of my clients begin doing nightscaping, but the client's employees weren't trained to do this. It was then his responsibility to make sure there was a means by which these employees could be trained.

**Summary**—If more companies establish plans for employee development strategies, there will be less turnover in the green industry.

One thing I often hear is that a certain company might not need that many managers. My response is easy: if you have that many capable bodies, maybe you should be expanding and not trying to limit your internal growth.





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application is recommended when re-growth occurs.) And while it's tough on weeds, it's easy on virtually all varieties of established turf.

Basagran T/O is also labeled for directed sprays in ornamental varieties.

For more information on how to control yellow nutsedge and broadleaf weeds with Basagran T/O, call **Toll Free 1-800-878-8060.**

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◀ Have park signs convey a clear, simple meaning.

## Designing, specifying signs for use in public parks

by Dr. Arthur H. Mittelstaedt, Jr.

**Playground signs are most effective when they command attention and are easily understood.**

■ To be effective, a sign is a control device and should meet five basic requirements:

- 1) fulfill a need;
- 2) command attention;
- 3) convey a clear, simple meaning;
- 4) command the respect of users; and
- 5) give adequate time for proper response.

To ensure that these requirements are met, the critical factors are design, location, operation/maintenance and standardization. The following recommendations should be considered in sign design:

**Text**—The statements on a sign should comply with the following guidelines:

- 1) Use simple, easily understood statements.
- 2) Bold print is a must.
- 3) Use short sentences.

- 4) Use short words.
- 5) Avoid excess words.
- 6) Limit fancy lettering.

**Symbols**—A pictograph is simply a symbol which is part of a recognized or accepted system of symbols, like handicapped and no smoking pictographs. Symbols are perceived faster than words and are especially effective with children, and where there are language, social and cultural barriers.

The following guidelines are important considerations:

- 1) The symbol should never be used alone where it might not communicate the full danger. Explanations are required.

### Signage colors, three levels



- 2) The symbol should not be complex.
- 3) Each symbol should be so unique that it will not be confused with another symbol, particularly precaution or prohibition pictographs.
- 4) The symbol must be competently drawn and executed.
- 5) The symbol must be used in the proper sign shape and proper colors must be used.
- 6) The symbol and words should be in close proximity to one another.
- 7) The symbol should express the full nature of the precautions or prohibitions involved.
- 8) The symbol should accompany the proper word choice: "danger" has a greater effect than "warning" or "caution."
- 9) The symbol could be used in conjunction with the three precaution words. Effective warnings in level of seriousness would be:

Danger: high voltage  
Warning: submerged obstacles  
Caution: sharp edges

**Colors**—The universally-recognized colors on signage are:

- red = danger
- orange = warning
- yellow = caution

The suggested colors are within the color tolerance limits specified by the United States Department of Transportation Color Tolerance Charts and the ANSI Standard Z535.1 ("American National Safety Color Code").

On instruction signs, lettering can be black. If a safety notice message, it can be green. If it is an information message such as "hospital" or "doctor," it can be the color light blue. If it is emergency aid service or equipment, it can be red. The standards should be further consulted for other colors.

**Shape**—The universally-recognized shapes are the square for use of the permission or prohibition symbol; the diamond for caution; the octagon for stop, along with the square with the horizontal bar (do not enter). Other shapes have also been standardized.

The specification for signs should follow the CSI format. The adjacent specification is an example of park signage being used in Nassau County, New York.

—The author is board chairman of the Recreation Safety Institute, P.O. Box 392, Ronkonkoma, NY 11779. Phone number at the institute is (516) 563-4806.



# A sample signage spec sheet

■ Here is how the Nassau County Parks Department specifies its signage:

## PLAY AREA ENTRY SIGN

**1. Description**—Under this item, the contractor shall furnish and install sign panels and sign supports in accordance with the plans and specifications.

**2. Materials**—All materials shall be of the best or top grade product for each particular item required herein.

Sign panels for both A & B signs shall be .125 (1/8) inch aluminum sheets cut to the dimensions specified.

Sign panels shall be painted with white ScotchCal on surfaces dry and cleaned free from all dirt, grit, grease and other foreign substances.

Sign panels shall have painted letters, Nazadar screen processing, #59-144, medium green synthetic gloss enamel available from (name of supplier, address, phone number), or approved equal, on a white background. Letter size shall be helvetica bold upper case or otherwise sized as per plans.

## Posts

The posts shall be 4x4-inch 100 percent recycled plastic lumber as manufactured by (name of supplier, address, phone number), or approved equal. Color to be gray. Height and length shall be as shown on the drawings.

The posts in footings or on the ground shall be treated with an approved bitumastic coating.

## Footings

Footings shall have a minimum depth of three feet and a minimum diameter of 12 inches, or as shown on the footing schedule, or as directed by the engineer. All concrete shall conform to item #18 Class B Concrete for Structures, but shall be included in the price bid for each item.

## Construction

The work shall be accomplished in a workmanlike manner.

All signs shall be level and plumb and withstand outdoor elements.

## Hardware

Bolts, nuts, washers and all other hardware shall be hot-dipped galvanized, tamper-proof steel.

## Text

### 1. PLAY STRUCTURES

No climbing down if anyone is in the way

No bumping another climber

No jumping off play structure  
No one-handed climbing  
No pushing, shoving or crowding

### 2. SWINGS

No standing on swings  
No swinging with more than one person at a time  
No swinging with one hand  
No swinging empty swings  
No jumping off or baling out  
No walking or sanding near to a moving swing  
No twisting chains

### 3. SLIDES

No head first  
No two together  
No sliding on back  
No standing or climbing on side  
No kneeling on slide  
No jumping  
No dangling arms or legs  
No sliding backwards or spinning around  
No sliding askew  
No dragging feet

### 4. SPRAY/PLAY AREA

No running  
No pushing or crowding  
No blocking spray  
No sitting or standing on or over spray nozzles  
No climbing  
Do not drink the water

### 5. SAND BOX/SPACES

No glass or sharp objects  
No throwing  
No eating in area  
No removing sand

### 6. ROCKING SHOVELING/MOVING DEVICES

No pulling or pushing  
No doubling up  
No standing near  
No placing feet or hands near moving parts  
No standing or sitting on handles or foot rests

**3. Method of measurement**—The quantity to be paid for under this item shall be per each unit or sign for Sign Type A and each unit or sign for Sign Type B and other designated sign types, including posts, hardware, excavation, grading, backfill, concrete footings and painting, furnished and installed in accordance with the plans, specifications and directions of the engineer.

**4. Basis of payment**—The unit price bid for each unit or sign shall include the cost of furnishing, lettering, installing concrete footings and all other work including labor materials, equipment and all incidentals necessary to complete the work.

— Dr. Millestaedt



**Kids want to play, not read. Let the symbols do the talking.**

Photo courtesy of Landscape Structures, Delano, Minn.



# Cooperation builds new athletic fields

**Voters in Rockford, Mich. approved a \$40 million bond issue for a new school and athletic facilities—built correctly this time.**

■ It helps to have friends in the right places—namely, on the school board—if you're in charge of school athletic fields.

In Rockford, Mich. (pop. 3,400), school board president James Bogart is an agronomist with the nearby firm of Turfgrass Inc. It's no coincidence that, within two years, this growing school system about 10 miles northeast of Grand Rapids will have a new high school and also:

- ✓ a 5,000-seat football stadium,
- ✓ varsity and practice baseball/softball fields,
- ✓ track and field facilities,
- ✓ a soccer practice field,
- ✓ two football practice fields, and
- ✓ eight tennis courts.

The district will have the new school and sports complex because voters smiled favorably on a \$40 million bond issue in November, 1989.

Playing key roles in the development of this ambitious project are Bogart and site planner/landscape architect Mark Wrona of the architectural firm Greiner, Inc., Grand Rapids. They've helped nurture and maintain cooperation among board members, designers and contractors concerning construction of the athletic fields, say co-workers.

Bogart insists passage of the bond issue was critical. He says the district had been growing by 250 to 300 new students a year. There was no more room in the schools.

Building a new school was one issue, but Rockford District residents also indicated by survey that they wanted more students to have the opportunity to compete. They wanted a more comprehensive school intramural program.

School leaders began addressing these wishes.

"The Rockford School Board determined early in the construction process that our new athletic complex would be done properly using modified soils, proper irrigation and adequate drainage," recalls Bogart.

Previously-built ball fields in the district, he says, suffer from three problems:

- poor construction and design,
- built on heavy clay soil without drainage,



**James Bogart says school board was committed to the best fields the school could afford.**

- and poor maintenance. (Is *that* all?)

So, starting from the ground up, school officials learned that topsoil at the 80-acre new school site contains 44.6% sand, 26.7% silt and 28.7% clay, adequate for the lawn in front of the school, but not good for sports fields.

The soil would have to be modified to make a good foundation for sports turf.

Coincidentally, test borings at the building site discovered existing sands in both fine and coarse texture. Samples were sent to Michigan State University for analysis. Yes, the report back from MSU said, the coarse sand is an excellent sand to use in an 80/20 sand/peat mixture for sports fields.

Securing the cooperation of site planners, architects and contractors, the sand



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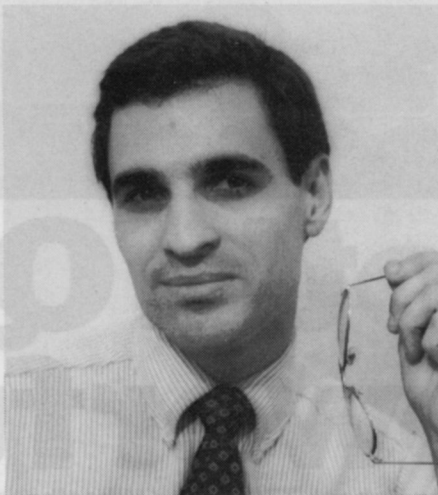


and topsoil were mixed and used on site, savings thousands of dollars in hauling costs.

In fact, since most of the coarse sand was found near the stadium, the board saved an additional \$15,000 by eliminating the drainage system beneath the football field.

(Ultimately the stadium field's growing media will consist of 75% sand, 15% peat, 10% topsoil and the equivalent of 80 lbs. of "Sand Aid" per 1,000 sq.ft. The soil mix for the remaining fields will be 50% coarse sand/50% topsoil mix over a sand/tile drainage system.)

Says Wrona: "A project like this is a constant series of tradeoffs and planning moves. But it can only be done if you have a very good relationship with the owner, and everybody understands where every-



**Wrona says a planner's job is to get the most for dollars allocated for site work.**

body is in terms of the budget."

Wrona continues to work with school leaders on the 80-acre site.

"All playing fields at Rockford High School will have an additional advantage not often afforded to many new sports fields," explains Wrona. "All fields will be allowed to grow a minimum of two growing seasons (one spring and one fall) prior to their use."

Preparing for the day when the fields are playable, Rockford has already hired a new grounds manager, and is developing fertility and field use policies.

The key to Rockford's success?—"A knowledgeable owner representing a positive, supporting community and taking best advantage of available sight design opportunities," says Wrona.

—Ron Hall

## Seasonal help: where to find them, how to choose them

### Seasonal workers might some day become full-timers, if you hire wisely.

by Ed Wandtke

■ Seasonal help has been one of the standards of personnel recruitment for the green industry. The use of seasonal employees allows the green industry company to avoid the extra costs of full time personnel and at the same time capture the enthusiasm received from fresh employees.

Some job applicants will be looking for more than just a job, although some will only be looking to make money. Others will want an opportunity to learn some additional skills and apply current knowledge. In the past, the seasonal employee has typically not been motivated, but the current economic conditions make this a buyer's market for the employer. Will you be ready to meet the challenge of these job applicants or are you just looking for people to fill the various jobs you have open at this time?

The financial needs of the unemployed will lead many over-qualified individuals to your company if the unemployment rate is very high. Be careful in hiring these job shifters. If an individual has been highly compensated in the past and your job

opening will not pay what he has been used to earning, expect him to leave as soon as a better paying job is offered.

Much of the turnover in the green industry occurs in the first two to four weeks on the job. It is extremely important to advise them that they will be expected to work in almost all weather conditions. Remember: you are used to working 10- to 12-hour days, but the prospective employee might be thinking he will only work eight-hour days.

**When to hire** — Deciding on how many seasonal employees you need should be done at least two months before you go to the market place to compete for the potential employees in the market. Letting your current employees know in advance of your seasonal employee needs will allow them to recruit for you. One of the most effective systems of finding quality seasonal employees is to have a job notice posted at the various churches within one mile of your shop. The quality of the applicants, their integrity, and highly-dedicated work ethic results in better-than-expected performance.

If your seasonal recruitment takes place at the start of the season, you will be forced into making decisions on the hiring of individuals based on the immediate need for the individual to be working. As a result, you will not be choosing the individuals who can satisfy both the short- and long-term needs of your company. These

type of last-minute hiring decisions will often result in increased turnover or in the hiring of an individual who just doesn't seem to work out. Avoid this process in your company by making the seasonal employee interviewing process a year-round activity.

**How to choose** — How would you describe your company's personality? You must now determine this before you hire seasonal employees. If not, you may hire some quality individuals who just don't seem to fit in.

When you hire your seasonal employees, you should consider the individual's adaptability to your company.

Flexibility, cooperation and a sense of teamwork are the key characteristics a person needs to bring to the job in order to contribute to the overall profitability and effectiveness of your company.

**Their job description** — It is very important to allow these people the opportunity to make decisions and have a chance for authority and responsibility. This opportunity for the individual to make decisions on the job and accept criticism will help the employee become an integral part of the company.

Evaluating their performance as well as that of your full-timers will encourage all employees to be concerned more with the job than the job title.

Helping all employees realize that there is a consistency requirement in the performance standards they will be expected to meet will help everyone become part of company.

—The author is a senior consultant with Wandtke & Assoc., Columbus, Ohio.



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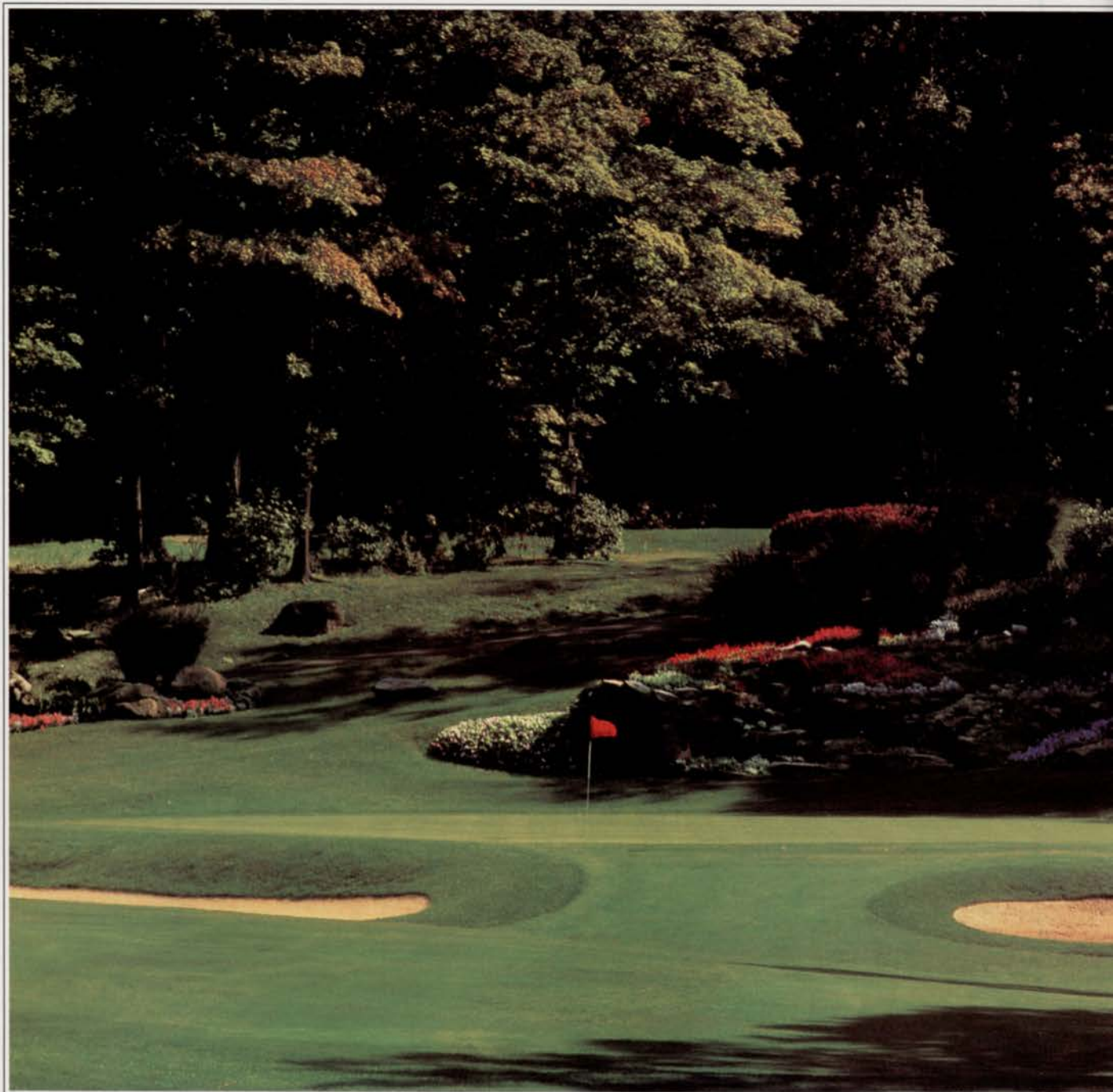
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# Removing trees to improve play

## Veteran golf course superintendents say tree management programs may be necessary on many golf courses.

■ Stanley Zontek says the chain saw is a marvelous tool in the fine art of maintaining golf turfgrass.

"Sometimes turf managers have to get out there and clear some underbrush and down some trees," claims Zontek, who travels the Mid-Atlantic region as the USGA's turf expert.

"The essence of our jobs as turf managers is to grow strong healthy grass, and we're not going to do it in the shade and we're not going to do it in pockets of poor air circulation," he adds.

Few golf course superintendents would argue with Zontek. They know their reputation and job hinges on how well they grow and maintain quality turf. They're

graded on the condition of turf, not the beauty or utility of trees.

Even so, stately or colorful trees grace most U.S. golf courses. Golfers, for the most



**Quast: anyone hitting a tree with a mower at Medinah must report it.**

part, appreciate trees and recognize them as valuable on the course.

Zontek himself claims he's not advocating "the wholesale removal" of trees on courses, particularly those that don't cause turf maintenance problems for the superintendent and aren't hazardous for golfers. "Who's going to argue with the spring color of sunburst honey locust after just coming out of a bleak winter?" he asks.

Danny Quast, golf course superintendent at the Medinah Country Club about 30 miles west of Chicago, says superintendents can provide fine turf and keep valuable trees on their courses.

They'll need a separate tree program to do it. They'll also probably need the help of an arborist.

Quast has had arborists on staff at both Milwaukee Country Club (where he was employed previously) and now at Medinah. "You need to have a management program for the trees just like we do our turf," he says.

A tree inventory was conducted by Dr. Tom Green before Quast joined Medinah. Green of the Morton Arboretum also graded the trees on a scale of 1-6, with one being a newly-planted tree and six being a dead tree or stump. In all, Green developed 225 pages of information about the 7,000 trees at Medinah.

"The information needs to be developed into a working program," insists Quast. (See accompanying article.)

He offers these suggestions for implementing a golf course tree program:

✓ Purchase a chipper. They're expensive but with rising landfill costs, they'll pay for themselves in a few years.

✓ Have available and use the proper tree care equipment—power saws, hand saws, cabling equipment, etc.

✓ Many trees on a golf course can be



trimmed from below with a pole saw.

✓ Make sure your arborist has an ornamental pesticide license.

✓ Never let your arborist climb alone.

—Ron Hall

## The tree program at Medinah C.C.

■ Medinah Country Club, site of three U.S. Open Championships, was built in a region once covered with oak forest. On its 650 acres are 799 white oaks, 449 burr oaks, 538 red oaks, 393 sugar maples, 326 shagbark hickories, 304 green ash and 103 American elm.

Medinah's working program involves:

- the services of an arborist (possessing a pesticide license),
- a planting program,
- pruning schedule,
- insect/disease control program,
- cabling and bracing procedures, and
- removal.

At Medinah, 120 new trees are planted annually. About 80 percent of these trees are species of the native forest; the remainder are chosen for their adaptability and ornamental characteristics.

Regular pruning, says superintendent Danny Quast, is necessary for the safety of players and spectators (40,000 a day attended the Open in 1990), and to improve the appearance and health of trees. He says some trees on the course were "topped" years ago. They're rotting from the top down. This improper pruning probably took 40 years from their lives.

Tree insect and disease problems on the large oaks are controlled by injections (Mauget's) and the smaller oaks receive Dursban spray in May and again in June. Every American elm at Medinah is treated at least once every three years to fight Dutch elm disease.

Quast says there are many reasons to remove particular trees on a course, including "just plain ugly."

—R.H.



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| 0010 <input type="checkbox"/> Sports complexes   | 0060 <input type="checkbox"/> Military installations & prisons            |
| 0015 <input type="checkbox"/> Parks  | 0065 <input type="checkbox"/> Airports                                    |
| 0020 <input type="checkbox"/> Rights-of-way maintenance for<br>highways, railroads & utilities | 0070 <input type="checkbox"/> Multiple government municipal<br>facilities |
| 0025 <input type="checkbox"/> Schools, colleges & universities                                 | <input type="checkbox"/> Other type of facility (specify)<br>_____        |
| 0030 <input type="checkbox"/> Industrial & office parks/plants                                 | _____   |
| 0045 <input type="checkbox"/> Condominiums/apartments/housing<br>developments/hotels/resorts   | _____   |

#### B. CONTRACTORS/SERVICE COMPANIES/CONSULTANTS:

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|---|--|
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| 0110 <input type="checkbox"/> Lawn care service companies                           | <input type="checkbox"/> Other contractor or service<br>(specify) _____        |
| 0112 <input type="checkbox"/> Custom chemical applicators                           | _____  |
| 0125 <input type="checkbox"/> Landscape architects                                  | _____  |

#### C. SUPPLIERS

- |   |   |
|---|---|
| 0205 <input type="checkbox"/> Sod growers           | <input type="checkbox"/> Other supplier (specify) _____ |
| 0210 <input type="checkbox"/> Dealers, distributors | _____   |

### 2. WHICH OF THE FOLLOWING BEST DESCRIBES YOUR TITLE? (Check only one)

- 10  EXECUTIVE/ADMINISTRATOR—President, owner, partner, director, general manager, chairman of the board, purchasing agent, director of physical plant
- 20  MANAGER/SUPERINTENDENT—Landscape/ground manager, superintendent, foreman, supervisor
- 30  GOVERNMENT OFFICIAL—Government commissioner, agent, other government official
- 40  SPECIALIST—Arborist, forester, architect, consultant, agronomist, pilot, instructor, researcher, horticulturalist, certified specialist
- 50  OTHER TITLED AND NON-TITLED PERSONNEL (specify) \_\_\_\_\_







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## Cool-season turf managers: watch for fairy ring, rust

**If droughts return, the North could see a recurrence of the near-invulnerable fairy ring rust and two rarely-seen blights.**

by Peter Landschoot, Ph.D.,  
Penn State University

■ During periods of unseasonably warm temperatures and drought, diseases such as fairy ring and rust become major headaches.

Fairy ring is caused by one of about 60 different soil-inhabiting fungi, the most common being *Marasmius oreades*. Fairy ring symptoms usually appear as rings or arcs of dark-green, fast-growing grass, sometimes accompanied by mushrooms.

Fairy ring can be a severe disease problem under drought conditions. Below the dark-green rings are massive amounts of fungal mycelium that can repel water. If this occurs when soil water is depleted, the result is desiccation of the turf. The hydrophobic effect can be a serious problem if fairy ring is extensive and irrigation water is not available.

Additionally, *M. oreades* can produce a toxin called hydrogen cyanide that damages turfgrasses.

In most cases, a light application of nitrogen fertilizer or iron will "mask" the dark green color associated with fairy ring.

However, there is no fool-proof means

of controlling the fungus that causes the rings to occur. Fungicides are rarely effective in controlling the disease in the field. The problem with obtaining effective control in the field centers on getting enough of the fungicide to contact the large amount of mycelium that permeates the soil. Also, it is difficult to wet the soil with drenches of fungicides because of the hydrophobic condition caused by the fungus.

At present, suppression of the hydrophobic effects of fairy ring is best



**Anthracnose basal stem and crown rot infests a *Poa annua* putting green.**

obtained by persistent irrigation and application of wetting agents.

Manipulation of cultural practices is the best option for managing this disease.

**Rust diseases**—Rust can be troublesome during drought, or when the turf is not well-fertilized. Although rusts don't kill the plants they attack, they can weaken them.

Rusts are caused by fungi in the genus *Puccinia*, and usually occur in late summer in the northern states. They are most

common on ryegrasses and bluegrasses, but can attack nearly all turfgrass species. Rust diseases rarely warrant fungicide applications. The best approach to managing rust diseases:

- supply the plant with nitrogen fertilizer; and
- irrigate.

Fortunately, in most years, rusts occur at a time that coincides with late summer fertilizer applications and frequent rainfall.

Weather conditions in 1991 also gave rise to diseases that, until recently, were considered rare.

**Other diseases**—Two especially troublesome diseases on golf courses were: (1) anthracnose basal stem and crown rot, and (2) foliar blight of perennial ryegrass (caused by *Pyricularia grisea*).

Anthracnose blight is a serious problem on golf course fairways in the midwestern and northeastern U.S.

Another less common form of anthracnose occurs on the crowns and stem bases of annual bluegrass and bentgrass, and is referred to as anthracnose basal stem and

*continued on page 58*



**Rust disease as it appears on Kentucky bluegrass.**

### ELSEWHERE

**Warm-season  
disease control,  
p. 58**

**Zoysia gains  
in popularity,  
p. 64**

**Seed priming  
speeds establishment,  
p. 72**



crown rot, (ABSCR) to distinguish it from the foliar blight.

Over the past 10 years, this disease has occurred more frequently on putting greens in several northeastern states. Symptoms of ABSCR on close-cut turf appear as yellow or orange-colored irregular patterns.

*Poa annua* is more frequently affected than bentgrasses:

1. Individual grass tillers turn yellow or orange at the leaf tips.

2. The entire leaf blade and sheath turn yellow and eventually a tan color.

3. The most distinct symptom of this disease is the black, rotted appearance of the crowns and stem bases.

4. The entire shoot can easily be removed from the plant crown.

5. Tiny, pincushion-like structures called acervuli may sometimes be observed on the stems and sheaths with a hand lens.

In Pennsylvania, we have observed the disease in early spring, mid-summer and late fall. In nearly every instance, the soils have been wet or saturated. The disease also appears to be more severe on compacted soils and under low mowing heights. Cultural practices such as aeration, light, frequent applications of nitro-

## Cool-season disease chart, page 62

gen fertilizers and high mowing heights may reduce some disease damage.

Some golf course managers report acceptable control when systemic fungicides are applied on a preventative schedule. The challenge in designing a preventive fungicide program for this disease lies in determining when it will occur.

**Pyricularia blight**—Last September, from New Jersey to Kentucky, many ryegrass fairways turned yellow and thin. At overseeded golf courses it was found that many of the new seedlings succumbed to rapid blighting and death. Weather conditions in many of these locations were very hot and humid over a period of several days. (It is important to realize that widespread problems such as this may be varied in cause and each situation must be considered on a case by case basis before making general conclusions.)

*Pyricularia grisea* was the primary culprit. This fungus is not well known above the transition zone, but is the cause of gray leaf spot on St. Augustinegrass and annual ryegrass in southern states.

On mature perennial ryegrass infected with *P. grisea*, early symptoms included:

● small, brown lesions or spots with dark brown borders;

● a zone of chlorotic tissue developed around the spots, eventually enveloping the entire leaf; and/or

● leaves often became tan in color and appeared shriveled.

In most cases, the crowns were not damaged and new leaf material was produced soon after cooler temperatures returned. Infected seedling plants appeared water-soaked and blue-gray in color. Many affected seedling plants collapsed within four or five days after symptoms first appeared.

It is unknown if resident populations of *P. grisea* were responsible for the occurrence of *Pyricularia* blight in southeastern Pennsylvania or if spores were carried from the South by a tropical storm that passed near this area immediately prior to disease outbreak. Plant pathologists will be monitoring this disease in the future to determine if this may be a disease we will have to contend with on a regular basis in the future.

—Dr. Landschoot is associate professor of turfgrass pathology at Penn State Univ.

# New diseases greet turfgrass managers in warm-season areas

## Two new diseases have been detected in certain southern turf areas, attacking St. Augustinegrass and bermuda.

by Monica L. Elliott, Ph.D.,  
University of Florida

■ *Gaeumannomyces*-like fungi are ever-present. They cause root rot diseases on both cool- and warm-season turfgrasses throughout the world. Common diseases on cool-season turf include summer patch and necrotic ring spot on bluegrass species and take-all patch on bentgrass.

Until recently, spring dead spot was the only disease on warm-season turf caused

by *Gaeumannomyces*-like fungi. This disease occurs on bermudagrass in locations where the bermudagrass becomes dormant due to cold temperatures. It is known to be caused by three different fungi in the US:

● *Gaeumannomyces graminis* var. *graminis* (*G.g. graminis*);

● *Leptosphaeria korrae* and

● *Ophiospherella herpotricha*.

Exactly which pathogen is causing the  
*continued on page 61*



Take-all patch of St. Augustinegrass: yellow, thinning turf in irregular patches.





Bermudagrass decline has been observed exclusively on putting greens.

problem seems to depend on the geographic location of the bermudagrass.

Two new diseases can now be added to the list. One is take-all patch of St. Augustinegrass (the proposed name), caused by *G.g. graminis*. This same fungus causes bermudagrass decline, a disease observed exclusively on golf course putting greens.

Both diseases primarily occur during the summer and early fall, when the weather is typically hot and humid throughout the Southeast. It is suspected that the root rot observed on zoysiagrass is also caused by *Gaeumannomyces*-like fungi, probably *G.g. graminis*.

Disease symptoms of St. Augustinegrass take-all patch when viewed above ground in sod production fields consist of yellow, thinning turf in irregular patches more than 10 feet in diameter. Roots of plants in these patches are short and rotted, and stolons are easily lifted from the ground. Nodes are often rooted, and black lesions may be observed on the stolons.

Similar symptoms have been observed on residential lawns, except affected areas are circular to irregular in shape and vary in diameter from less than one foot to more than 10 feet. In some cases, the grass will die and "thin out," exposing bare soil; or the grass will appear drought stressed. However, in all cases, the roots are short and rotted, resulting in distinctive black roots.

**Stress reduction a key**—The disease has been identified in Florida, Alabama and Texas. Since this is a new disease, cultural and chemical control methods have not been determined, but any practice that alleviates stress will be useful.

The symptoms common to take-all patch are similar bermudagrass decline.

Usually, symptoms will first develop on the "clean-up pass" of the putting green, but it can spread across the entire green.

Irregular yellow patches develop first, and, if not treated, plants will die and the turf will gradually "thin out" to bare ground. Again, the roots are short and rotted. The disease may appear similar to nematode damage or pythium root rot. Therefore, it is important to have the cause of the symptoms diagnosed by a pro-

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**Disease symptoms of St. Augustinegrass take-all patch when viewed above ground in sod production fields consist of yellow, thinning turf in irregular patches more than 10 feet in diameter.**

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fessional. Preliminary evidence indicates that the best curative or preventive treatment is to maintain a higher height of cut than is normally maintained in the summer months.

Some *Gaeumannomyces*-like fungi cause more than one disease, and some diseases are caused by more than one pathogen. However, the pathogens and the diseases they cause are actually very similar in nature. All of these pathogens are commonly associated with grass roots. Therefore, the potential for disease development is very high. However, the actual disease will depend on the stresses placed on the turf host.

## Warm-season disease chart, page 64

**Attacks root system**—The *Gaeumannomyces*-like fungi live on the outer root surface. The initial root penetration by these fungi may be unnoticeable or, at the most, result in a general discoloration of the root. If conditions are favorable, these fungi penetrate and occupy the vascular tissue of the root, which consists of water-conducting tissue (xylem) and carbohydrate-conducting tissue (phloem). Above-ground symptoms still may not be evident at this time. However, a plant with a damaged root system is more susceptible to stress than a healthy plant, because it has to work harder to obtain nutrients and water from the soil and is not able to store carbohydrates produced by the leaf tissue.

Whether the disease progresses or not depends upon accompanying plant stress. Lower stress will result in a patch that shows no symptoms above ground, despite having an infected root system. A high-stress situation, if not alleviated, will kill the plant.

Under high stress, the root, stolons and rhizomes continue to rot and become dysfunctional, resulting in the characteristic "patches" of dead or damaged turf associated with the diseases caused by *Gaeumannomyces*-like fungi. Because these pathogens move slowly through the root system and not the leaves, these patches often appear yearly in the same location.

The three components required for any disease are:

- a susceptible host;
- a virulent pathogen; and
- a conducive environment.

With patch diseases, once the *Gaeumannomyces*-like fungi and turf host are established on the site, the only thing that changes is the environment, usually the micro-environment surrounding each turf plant or group of plants. Thus, cultural control methods are the best control methods for patch diseases because they are usually aimed at affecting a change in the turf environment. Most evidence indicates that systemic fungicides are effective only as preventive medicine. In other words, the fungicide must be applied before severe symptoms develop.

—Dr. Elliott is assistant professor of turfgrass pathology at the University of Florida's Ft. Lauderdale Research and Education Center.





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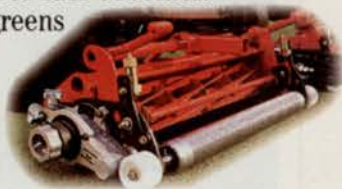
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## Diagnostic Features of Prevalent Cool-Season Turfgrass Diseases

Disease	Causal agent(s)	Symptoms/signs	Susceptible grasses
Brown patch	<i>Rhizoctonia solani</i>	Large, circular brown patches or thinning of turf. On low-cut turf, patches often surrounded by dark rings. White, cottony mycelium may be present on high-cut turf in early morning.	Bentgrasses, ryegrass, tall fescue.
Dollar spot	<i>Lanzia spp.</i>	Small, bleached patches of dead grass appear in turf. Lesions on leaves are white, often with brown borders. White, cottony mycelium may be present on dew-covered turf in early morning.	All cool-season turfgrasses.
Leaf spot/melting out	<i>Drechslera</i> and <i>Bipolaris spp.</i>	Small tan lesions with purple or brown borders on leaf blades. In severe cases, the crowns are rotted and the turf may be significantly thinned.	Primarily Kentucky bluegrass. Other cool-season grasses may be affected.
Necrotic ring spot	<i>Leptosphaeria korrae</i>	Large ring-shaped patches, usually creating depressions in turf. Roots and crowns show brown or black rot.	Primarily Kentucky bluegrass. In some cases, fine fescues and annual bluegrass.
Pythium blight	<i>Pythium aphanidermatum</i> and other <i>Pythium spp.</i>	Irregular patches of blighted turf. White, dense, cottony mycelium growing in turf in morning.	Perennial ryegrass, bentgrasses, tall fescue.
Red thread/pink patch	<i>Laetisaria fuciformis/</i> <i>Limonomyces roseipellis</i>	Small red to pink patches of blighted turf. Long slender threads of red mycelium (red thread), or fluffy, pink mycelium (pink patch) growing out of foliage.	Fine fescues, perennial ryegrass, Kentucky bluegrass.
Summer patch	<i>Magnaporthe poae</i>	Large yellow or tan ring-shaped patches. A root crown rot is usually apparent.	Bluegrass and fine fescues.

## Control Strategies for Prevalent Cool-Season Turfgrass Diseases

Disease	Cultural control	Chemical control	Resistant species/varieties
Brown patch	Avoid excess N in summer, increase air circulation, avoid excess watering, improve drainage.	anilazine; benomyl; chlorothalonil; iprodione; mancozeb; maneb thiophanates; thiram; vinclozolin	Kentucky bluegrasses are less-susceptible to brown patch than other cool-season turfgrasses.
Dollar spot	Avoid N deficiency, maintain good soil moisture, remove guttation and dew from leaf surfaces, avoid night watering.	anilazine; benomyl*; chlorothalonil; fenarimol; iprodione; mancozeb; propiconazole; thiophanates; thiram; vinclozolin	Resistant Kentucky bluegrass varieties include Adelphi, America Aspen, Challenger, Eclipse, Escort, Nassau, Somerset, Wabash**
Leaf spot melting out	Avoid excess N applications in early spring; mow 2" high; avoid light, frequent irrigation. Do not use benomyl, thiophanates or triadimefon to control.	anilazine; chlorothalonil; iprodione; maneb; mancozeb; vinclozolin	Resistant Kentucky bluegrasses include: Adelphi; Bristol; Destiny; Eclipse, Enmundi; Glade; Ikone; Liberty; Majestic; Mona; P-104; Rugby and Somerset.
Necrotic ring spot	Manage turf for maximum root growth; irrigate to maintain good soil moisture; maintain mowing height at 2" or above.	benomyl; fenarimol; propiconazole,	Perennial ryegrasses resistant.
Pythium blight	Improve drainage, increase air circulation, avoid excess N, reduce irrigation.	chloroneb; etridiazole; metalaxyl*; Fosetyl-AI; propamocarb	Kentucky bluegrass is less likely to be damaged by Pythium blight than other turf.
Red thread/pink patch	Maintain adequate fertility of turf (especially N).	alilazine, benomyl***, chlorothalonil, iprodione, propiconazole,	Resistant perennial ryegrasses include: Allaire, Commander, Delray; Manhattan II; Palmer; Pennant; Prelude; Regal; Regency; SR 4000; SR-4100; and Yorktown.
Summer patch	Avoid low mowing heights, reduce compaction, avoid overwatering in summer; improve drainage.	benomyl; fenarimol; propiconazole; thiophanates; triadimefon	Resistant Kentucky bluegrasses include Adelphi; Enmundi; Syd-sport and Touchdown.

\* Resistance has been recorded.

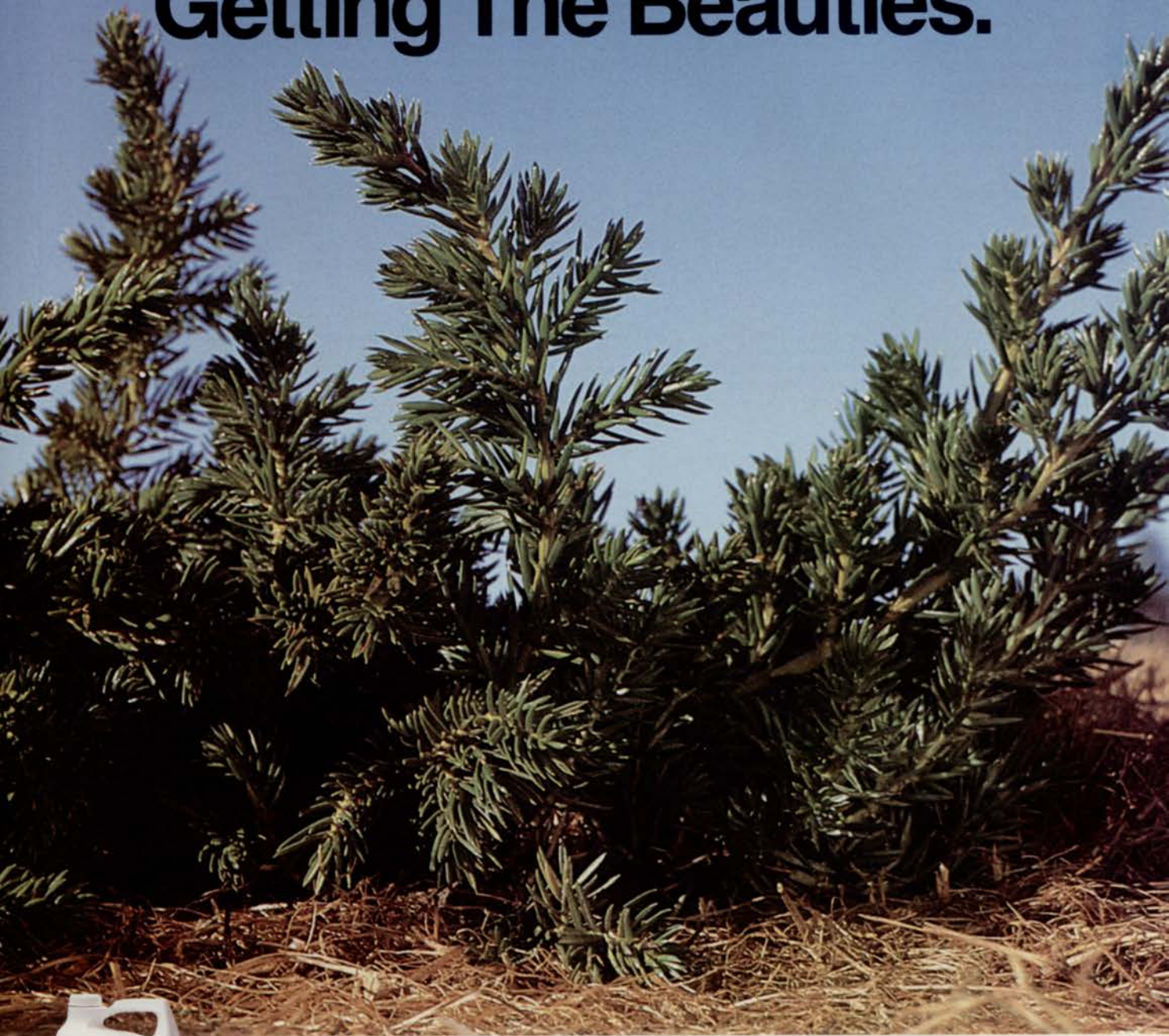
\*\* Based on National Turfgrass Evaluation Program and Penn State data. No endorsement of cultivars is intended for those mentioned, nor is criticism meant for cultivars not mentioned.

\*\*\* Controls red thread and not pink patch.

Source: Dr. Landschoot



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## Diagnostic Features of Prevalent Warm-Season Turfgrass Diseases

Disease	Causal agent(s)	Symptoms/signs	Susceptible grasses
Bermudagrass decline	<i>Gaeumannomyces</i> spp. or similar fungi as yet undetermined.	Begins as small, irregular, yellow patches which expand and thin-out as grass dies. Roots are short, thin and rotted, usually observed first at edges of putting greens.	bermudagrass*
Brown patch (Rhizoctonia blight); Rhizoctonia leaf and sheath spot	<i>Rhizoctonia solani</i> , <i>R. zeae</i> , <i>R. oryzae</i>	Begins as small, circular light green patches that turn yellow and then brown or straw-colored. Patches expand to several feet in diameter. Turf at outer margin of patch may be dark and wilted (smoke ring). Whole leaf facsimiles pull up easily due to basal rot of leaf sheath. Aerial blight common with centipedegrass and St. Augustinegrass. In warm months, may also observe light-brown foliar lesions.	Bahiagrass, bermudagrass, centipedegrass*, St. Augustinegrass* zoysiagrass*
Gray leaf spot	<i>Pyricularia grisea</i>	Lesions begin as small, brown spots that expand into oval areas with tan centers and dark and purple or brown margins. Yellow halo may be present. During warm, humid weather, lesions covered with gray velvet mat of mycelium. Leaves wither, resulting in scorched appearance.	St. Augustinegrass*. Yellow-green cultivars are less susceptible than blue-green/bitter-blue cultivars. St. Augustinegrass treated with the herbicide atrazine is more susceptible.
Helminthosporium leaf spot/melting-out	<i>Bipolaris</i> , <i>Drechslera</i> and <i>Exserohilum</i> spp. (previously <i>Helminthosporium</i> fungi); and <i>Curvularia</i> spp.	Leaf spot symptoms vary with specific pathogen and host from small, solid brown to purple lesions to expanded lesions with bleached centers that girdle the leaf blade. Severely infected leaves turn reddish-brown to straw color. 'Melting-out' occurs under severe infection as turf areas thin and die. Lesions on stems are dark purple to black. Crown and root rots will also occur.	bermudagrass*, St. Augustinegrass, zoysiagrass
Pythium root rot	<i>Pythium</i> spp.	General turf browning and thinning. Roots appear thin with few root hairs and have a general discoloration. Turf does not respond to N applications.	All warm-season turfgrasses are susceptible.

\* Most susceptible species

## Control Strategies for Prevalent Warm-Season Turfgrass Diseases

Disease	Cultural control	Chemical control	Resistant species/varieties
Bermudagrass decline	Aerate and topdress greens monthly during late spring, summer and early fall. Apply $\text{NH}_4\text{-N}$ rather than $\text{NO}_3\text{-N}$ . Balance N with K and apply micronutrients. Raise mowing height during outbreaks.	benomyl; fenarimol; propiconazole; thiophanate methyl, triadimefon	No resistant cultivars available.
Brown patch	Avoid excess N, especially readily available forms of N. Avoid excess irrigation.	anilazine; benomyl; chlorothalonil; iprodione; maneb; mancozeb; PCNB; thiophanate methyl; thiram. Do <b>not</b> use benomyl or thiophanate methyl if causal agent is <i>R. oryzae</i> or <i>R. zeae</i> . Use fenarimol, propiconazole and triadimefon as preventive, not curative compounds.	No resistant species are available.
Gray leaf spot	Avoid excess N. Irrigate deeply and only when necessary.	chlorothalonil; propiconazole; thiophanate methyl + mancozeb	Yellow-green cultivars of St. Augustinegrass are less susceptible. St. Augustinegrass treated with the herbicide atrazine is more susceptible.
Helminthosporium leaf spot/melting-out	Avoid excess N. Balance fertility components. Irrigate deeply and less frequently. Avoid thatch accumulation. Raise mowing height during disease outbreaks.	anilazine; chlorothalonil; iprodione; maneb; mancozeb; propiconazole; vinclozolin	No resistant species are available.
Pythium root rot	Improve drainage, aerate and reduce irrigation.	chloroneb; ethazol; metalaxyl; fosetyl-AI; propamocarb. Except for fosetyl-AI, these fungicides should be watered into the rootzone.	
Spring dead spot	Avoid low mowing heights, thatch, compaction and excess N.	benomyl; fenarimol; propiconazole; thiophanate methyl	No resistant species of bermudagrass are available.

Source: Dr. Elliott





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North Star Development Co., Inc.  
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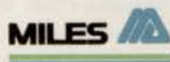


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# Zoysia: a grass for the future — and not just on golf courses

**New seeded zoysias will fit in because of lower prices and even lower management requirements.**

■ Does zoysiagrass have a future in the green industry—not only on golf courses, but also on athletic fields and home lawns?

Dr. Milt Engelke of Texas A&M University says it does.

"The future is real bright," says Engelke. "This grass is greatly under-used. It, along with buffalograss, will be politically and environmentally 'correct' in the next few years."



**Engelke: sees zoysia popularity spreading**

Engelke, whose research has led to a "DALZ" series of experimental cultivars, thinks that consumer education will determine how widely the zoysias are actually accepted.

"Right now, one of the biggest problems is cost; it's extremely expensive," Engelke says.

But he further notes that zoysia's initial costs are eventually offset by low maintenance costs, including much less water.

"The new zoysias," he adds, "will be far more cost-effective as production time is reduced. We'll see more zoysia in home lawns and athletic fields as the cost comes down. Education will be the bottom line. And it'll take a decade for us to properly educate the consumer."

Zoysiagrass is native to Asia, but is well adapted to warm humid and transition areas of the U.S. It begins to go dormant at about 55° F. Engelke believes that, given time, its popularity may also spread to the southern and western U.S.

Adjectives most often used to describe zoysia are uniform, dense and low-growing. Because of its density, zoysia has superior resistance to weeds. Its stems and leaves are tough and stiff, resulting in excellent playability on golf course fairways.

**Success on the course**—Golf course superintendents near Kansas City and in Tennessee rave about zoysia's performance on fairways.

Members of Lawrence, Kansas's Alvarado Golf & Country Club, where Dick Stuntz is superintendent, find the zoysia to their liking. And Stuntz appreciates the fact that "if you keep nitrogen applications down and control traffic, you can turn the water off."

He cuts his fairways at 1/2 inch, three times a week, and applies pesticides only when necessary.

"The vast majority of our areas have tolerated the low height of cut very well," he observes. "I'm headed for 3/8ths of an inch—not for playability, but for thatch control."

Here is the program his zoysia is on:

- **Fertilization:** 1 to 2 lbs. N per 1000 sq. ft. per season; 3 to 4 lbs. K<sub>2</sub>O per 1000 sq. ft. per season
  - **Poa control:** Roundup at 24 oz. per acre
  - **Weed control:** pendimethalin at 1 1/2 lbs. per acre, twice per season (April 1-15 and May/June)
  - **Post-emergence crabgrass control:** Daconate at 1 to 2 oz. per 1000 sq. ft.
  - **White clover control:** Banvel 4S at 32 oz. per acre
  - **White grub control:** trichlorfon at the third instar stage (when damage is detected) with pre- and post-irrigation
- In order to avoid winterkill, Stuntz's program includes:

1. Eliminate cart traffic, if possible.
  2. Around Sept. 15, raise height of cut to 3/4 or 7/8 inch.
  3. Use adequate K<sub>2</sub>O.
  4. Make sure drainage is adequate.
- David Stone at The Honors Course, Ooltewah, Tenn., finds the biggest problem is keeping bermudagrass out of his

zoysia fairways. He uses a variety of bermudagrass herbicides to get good results, when applied four times per year (June 1, July 1, Aug. 1, Sept. 1).



**Stone: bermuda encroachment a problem**

"You can never totally eliminate the bermuda in our area, but you can totally control it," he claims.

Besides the work being done at Texas A&M University, Jack Murray in Florida is also conducting research on seeded zoysias, which would make the grass more practical for a wider range of uses.

Says Engelke: "The biggest problem with zoysiagrass is management. Most people over-manage it. But I see zoysia becoming much more dominant in the next decade, and seeded zoysias will fit in because of even lower management requirements."

—Jerry Roche

—The American Zoysiagrass Association is a new organization working on raising the consciousness level of the turfgrass industry toward the zoysias. For more information, contact Frank Whitbeck at Windrock Grass Farms, Little Rock, Ark.: (800) 225-0303.

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- x Slow recovery
- x Weak color
- x Susceptible to winterkill
- x Thatch accumulation
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- x Growth cycle
- x Compacts easily
- x Damaged by nematodes

Sources: Dr. Milt Engelke, Dick Stuntz



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## Priming and pre-soaking for faster turf germination

**Laboratory research has found that seed priming has several advantages over pre-soaking or pre-germination.**

■ Dr. Doug Brede of the Jacklin Seed Co., says pre-soaking and/or priming turfgrass seed can speed germination when you want grass to establish in faster-than-normal times.

"After six weeks under optimal growing conditions, it is nearly impossible to tell a primed bluegrass field from an unprimed one," says Brede. "The benefits of priming come when temperatures are adverse, or when bluegrass is mixed with a fast-germinating species such as ryegrass that normally tends to overwhelm the slow-germinating bluegrass."

An obvious use for pre-soaking/priming is on athletic fields, where only a short period is allocated between games for re-seeding.

The difference between priming and pre-soaking? In seed *priming*, root and shoot don't break the seed coat and can be planted by traditional methods; if you *pre-soak* the seeds, however, you must plant them wet, which normally means that hydroseeding (rather than spreading) techniques must be used.

**Pre-soaking**—"Pre-soaking is easy with perennial ryegrass and tall fescue," Brede claims.

First step in pre-soaking is to put the

seeds in a 55-gallon drum filled with water. Then, aerate them with an aquarium pump and airstone. Wait 48 hours and plant while still wet.

This process, however, produces what Brede terms "mixed results." It is far better, he claims, to pre-soak annual ryegrass and tall fescue with a hormone solution.

### Germination speed of primed grasses, fastest to slowest:

- 1- annual ryegrass
- 2- perennial ryegrass
- 3- fine fescue
- 4- tall fescue and bermudagrass
- 5- Kentucky bluegrass
- 6- zoysiagrass

Source: Dr. Brede

In this case, add 6 oz. of gibberellic acid per 10 gal. of water. Seeds will germinate

◀ Laboratory research at Jacklin Seed Co. has found that seed priming has these advantages over pre-soaking or pre-germination: (1) it can be dried back and stored for up to two months; and (2) it can be planted via conventional spreaders.

Photo courtesy Dr. Doug Brede

about three days sooner than if the gibberellic acid was not added.

"Pre-soaking is cheap and easy, but aeration is a must for both pre-germination and pre-soaking," says Brede.

**Priming**—As a rule of thumb, priming—at best—cuts the field germination period in half.

"Primed seed will germinate faster under cooler (60° F) conditions," Brede observes.

Though results with primed seed are usually better than with pre-soaked seed, priming does present some difficulties. Light is needed to increase the germination index of some species like bluegrass, which also needs free oxygen during priming. Some species—like bluegrass, again—also excrete toxins that inhibit the priming process.

Optimal priming times are five days for Kentucky bluegrass, two to three days for perennial ryegrass. "Stop priming when you first notice root emergence," Brede warns.

Primed seeds have a shelf life that slowly wears off until, after three months, all effects are usually lost.

"After six months, germination of primed seeds is actually poorer," Brede notes. (Pre-germinated seeds, on the other hand, must be planted right away.)

—Jerry Roche



A 10-year-old seed lot of Fylking Kentucky bluegrass springs back to life (right) after seed priming. Untreated grass from the same lot (left) has still not begun to emerge at one week after sowing. Photo courtesy Virginia Kanikeberg



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# Correct identification vital to mole damage control

■ Correct identification is vital to mole damage control.

Some species of moles have large shovel-like front feet with long claws.

The *eastern* mole has a naked red nose and a short tail. It usually makes many shallow tunnels that raise the soil into long winding two-inch high ridges. The few mounds it makes are low, rounded and often have bits of turf on them. It prefers well-drained soils.

The *star-nosed* mole has a large red nose with 22 finger-like projections and a long tail. It usually makes deep tunnels not evident on the surface, but it pushes up soil from these funnels into many conical mounds of raw earth. Some mounds may be more than six inches high and 12 inches wide. It prefers moist soils.

The pattern of tunnels and hills made by both moles varies with soil conditions.

Moles frequently cause damage, but are also beneficial: they are insectivores that feed on insects, worms and other invertebrates. They also irrigate and aerate the soil by burrowing. Occasionally they eat plant seeds, roots and bulbs; but most damage is done while burrowing for insects when they uproot the plants and grass roots.

They are most active in spring or fall, on cloudy days and following rainy periods during the summer. During winter and midsummer dry conditions, they go deep into the ground. They have a very extensive underground tunnel system, including travel tunnels (which are used daily) and foraging tunnels (rarely re-used).

When moles become a problem, the following methods can be used to control damage:

**1) Direct killing**—Although eastern moles may burrow at any time, they are usually most active at certain times, depending on the season. Note when most new activity occurs, or when flattened ridges or mounds are repaired.

Once you have determined when the eastern moles are most active, look during those times to see the long, winding ridges being pushed up by the eastern mole tunneling just below the surface of the ground. With practice, you can quickly and quietly approach the tunneling mole and kill it by smashing the earth down

with a shovel or similar instrument just behind where the earth is being lifted up.

Repeatedly use of this method can gradually remove eastern moles from an area. But it rarely works for the star-nosed mole because it usually burrows too deep.

**2) Trapping**—Eastern moles are easy to trap, provided that the trap is placed on a tunnel that is actively being used every day and that problems with function of the trap are noted and resolved.

Locate active tunnels of eastern moles by gently mashing a short section of every ridge that you can find with your foot and marking it in some way. Any ridge that has been pushed back up within 12 to 24 hours is over an



The star-nosed mole prefers moist soils.

active tunnel. Traps placed on these ridges should catch the moles every 24 to 48 hours. If a trap hasn't caught a mole in three days, it is in the wrong location, or it has caught all the moles using that particular tunnel and should be moved to a new location.

Of the three types of traps, the choker type seems to be the easiest for most people to use successfully on the eastern mole. In heavy clay soils, the frame of the harpoon trap will sometimes rise up out of the ground rather than impale the moles. If this happens, use pieces of wood or metal to stake the trap to the ground.

With all types of traps, work the harpoons or jaws of the trap back and forth or up and down through the soil to ensure smooth penetration of the soil. If any trap is sprung prematurely so that the mole is not caught, remove a small piece of sod from under the trigger pan so as to delay its action. If moles burrow around a trap, then either the soil has been flattened too tightly, or part of the trap is projecting into the tunnel and alarming the mole.

To trap star-nosed moles, locate active tunnels by scattering the soil of each mound until it is flat. Mounds that are pushed back up in 24 to 48 hours are over

active tunnels. To set the trap, it is necessary to dig a hole under one of the mounds of earth. The hole should extend to the bottom of the mole's tunnel, usually four to six inches below the surface of the ground. Refill the hole with enough earth to cover the top of the mole's tunnel with approximately two inches of earth. Set the harpoon-type trap in the hole.

**3) Reducing the mole's food supply**—Using insecticides to reduce insects and related invertebrates may eliminate enough of the mole's food supply, especially in sandy or light soils, so that they either starve or move elsewhere.

In clay and organic soils, earthworms are usually abundant enough to make insecticide application ineffective.

**4) Poison baiting**—Poison baits for moles that contain 2% zinc phosphide can be used to control moles. Place teaspoon quantities every 10 to 15 feet along mole travel tunnels. To place the bait in the tunnel, punch a hole in the tunnel roof with a 1/2-inch wood or metal rod. Pour the bait through the hole into the tunnel and then repair the hole with a piece of sod or wadded newspaper.

Repeat treatment weekly until mole activity ceases. *Caution: zinc phosphide is toxic to birds and mammals. Use with caution.*

**5) Calcium cyanide**—Locate active tunnels and use a duster to blow calcium cyanide into the tunnels in both directions every 5 to 10 yards. Seal openings. Two to three pumps on the duster are sufficient. *Note: calcium cyanide may kill the roots of plants in the tunnels.*

**6) Aluminum phosphide (Phostoxin)**—Locate active tunnels and place a tablet into all tunnels every 5 to 15 yards during the afternoon and evening. Use as many tablets as necessary to obtain complete coverage of the entire mole system, not just the tunnels in one area, such as the yard. If the first treatment is not successful, repeat treatments eventually are. Do not use within 15 feet of any building. Keep lid on container tightly fastened at all times.

**7) Experimental materials**—Several products are now being tested. Check with your county's cooperative extension agent for current status.

—This article was originally printed in "Turf Times," a publication of the Northern Michigan Turf Manager's Association



# It's that time of year: Japanese beetle time

■ Warm weather brings with it the arrival of Japanese beetles. These voracious insects begin their summer feeding frenzy in late June or early July in most cool-season areas, a practice they keep up through August. Some may even linger until late September.

Although adult Japanese beetles seem especially attracted to roses, annuals, vegetables and grapes, they can—and do—feed on more than 250 kinds of plants, according to Dr. Lee Hellman, an extension entomologist with the University of Maryland. Just one or two of the insects can virtually destroy a flower in a matter of hours.

When it comes to control, there's good news and bad news. The good news is that

control methods are available; the bad news is that none of them is completely effective, Hellman says.

Although insecticides will kill Japanese beetles that eat or walk on treated leaves, they remain effective for only a few days—a week at the most. You may need to spray some ornamental plants several times during the summer to prevent serious damage caused by the beetles as they migrate from one yard to another.

The most common insecticides for use against Japanese beetles are

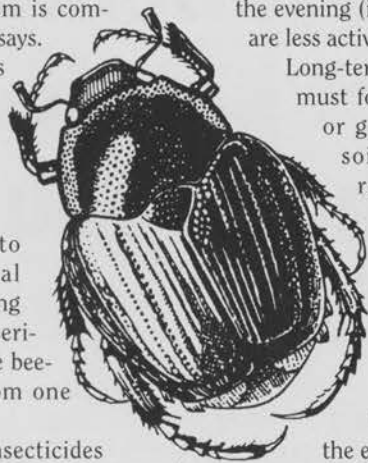
malathion and carbaryl (Sevin). Both are effective, if applied according to label directions. They may be used on fruit trees, but may involve a pre-harvest waiting period.

"One thing to keep in mind," says Hellman, "is that carbaryl is highly toxic to honey bees. If you use it, apply it late in the evening (if possible) when the bees are less active."

Long-term control of the beetles must focus on the larval stage, or grub, which lives in the soil and feeds on grass roots, causing approximately 95 percent of all grub-related turf damage.

"Early August is the best time to inspect lawns for larvae," says Hellman.

"By this time, most of the eggs have hatched and the larvae are 1/4 to 1/2 inch long."



# Iron, nitrogen aid in moss control

## Chemical control and cultural practices will slow moss on golf greens.

■ Golf course superintendents are mowing greens shorter and keeping the nitrogen fertility lower than ever before to obtain faster speeds. A consequence has been a reduction in turfgrass vigor to a point where the greens are much more prone to weed encroachment. One of the more troublesome weeds to have become a problem is moss.

**Chemical control**—In early spring, moss begins earlier than bentgrass. Hydrated lime applied in late March at three to five pounds per 1000 square feet will burn back the moss during this period. Mix with a dry sand topdressing.

Scotts Goosegrass Control—a Betasan/Ronstar combination labelled for use on bentgrass greens—provided 83 per-

cent control from only a single application. This product causes some discoloration, but it appears to be one of the more promising moss control products.

Siduron (Tupersan) and bentazon (Basagran) provided 53 to 74 percent control of moss. While they were not quite as effective as the Scotts product, both siduron and bentazon were safer since no injury occurred for either product.



**Cultural control**—While silvery thread moss will tolerate dry conditions, it is favored by an abundance of free water.

Core cultivation, immediately followed by sand topdressing, would create a system of "vertical drains" that would facilitate a rapid removal of surface water. Moss removal was hastened where this practice was followed compared to core cultivation alone. Deep spiking was also beneficial compared to core cultivation alone.

Nitrogen and iron are the most important tools for moss control. Moss was eliminated over two growing seasons from plots that were 40 percent moss by increasing nitrogen rates to about 0.8 lbs. per 1000 square feet per growing month (6 lbs. N/year). Iron applications at a rate of 6 ounces per 1000 square feet per month were beneficial during the first year, especially at the higher rates of nitrogen. Minimize nitrogen's effect on green speed by careful control of water, double cutting or higher potassium levels.

—Dr. Norman Hummel, Cornell University, writing in the *Northeastern GCSA's "Our Collaborator,"* Sept. 1990.



When it comes to turf grass pest control, there is a wide array of products on the market to choose from. The difficult part is actually determining which particular product to buy.

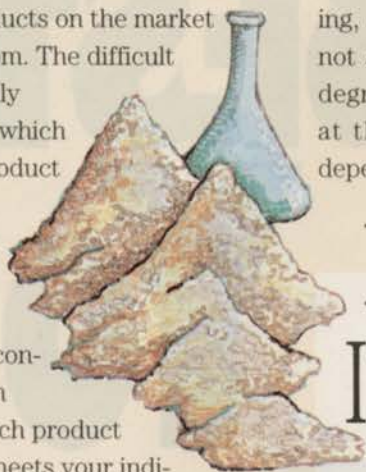
The factors that need to be consciously considered when deciding which product specifically meets your individual needs include:

- degree of control,
- residual,
- formulation,
- ease of application,
- environmental impact,
- economics, and
- availability.

Yet, once you find an insecticide that suits your needs, a new product is often introduced to the market, and you're faced with the decision-making process all over again.

The newest product available for turf pest control on golf courses is CRUSADE® 5G Granular Insecticide. Its active ingredient, fonofos, a mainstay for years in other markets, is now offered for golf course use by ICI Professional Products.

Fonofos is an organophosphorus soil insecticide that repeatedly demonstrates superior efficacy against economically-important turf grass pests, including white grubs, mole crickets, chinchbugs, sod webworms, billbugs, and cutworms. Liquid in its technical grade, fonofos is formulated as a granule in CRUSADE for the golf course, as well as for use on commercial sod farms.



Once applied and irrigated, fonofos releases from its carrier and attaches to the soil. It resists leaching, exhibits no phytotoxicity and is not affected by enhanced microbial degradation. CRUSADE is applied at the rate of 60-80 lbs. ai/acre, depending on the target pest.

## NEW TURF INSECTICIDE MEETS SUPERINTENDENTS' SPECIFICATIONS

CRUSADE 5G FOR NON-RESTRICTED USE  
ON GOLF COURSES

### Residual Control of White Grubs

Prolonged residual in the soil gives CRUSADE the ability to control white grubs and other troublesome pests in various stages of their life cycles over an extended period of time. This particular product feature makes CRUSADE highly cost effective for the user.

At the University of Rhode Island in Kingston, entomologist Steve Alm applied CRUSADE at 4.0 lbs. ai/acre to fairway turf comprised of bentgrass, perennial ryegrass, and

Kentucky bluegrass. The result of Alm's 1991 studies indicated that CRUSADE provided 96 percent control of white grubs.

Alm credits the residual of CRUSADE as the reason for its superb control. "Fonofos at 4.0 lbs. ai/acre was outstanding in control,"

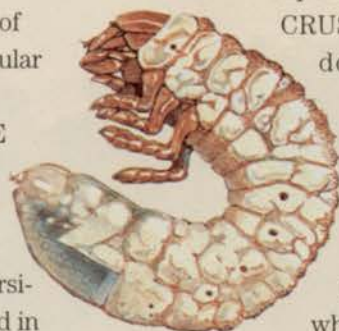
Alm says. "Other materials provided good to fair control. One factor that probably affected control levels was a prolonged hatch of eggs."

According to Alm, CRUSADE was applied late in August. He explains, "Japanese beetle eggs and first and second instar were recovered from plots on September 23rd. Shorter lived materials would not provide adequate control over the extended hatching period."

The longevity of CRUSADE in the soil enhances the product's value, according

to Bob Yarborough, vice president for control products at Lesco, Inc. in Rocky River, Ohio.

Formerly a golf course superintendent, Yarborough claims CRUSADE is unique because "it doesn't have the enhanced microbial degradation of other soil-active insecticides. That gives the product the residual necessary to provide prolonged control of the white grub at various stages of development. With CRUSADE, one well-timed application should provide adequate residual and control."





## Excellent Mole Cricket Control

CRUSADE also provides excellent control of both the nymph and early adult stages of the mole cricket for several weeks or longer. Again, the residual of CRUSADE makes this new weapon in the arsenal of mole cricket insecticides the most cost-effective control on the market today.

At Quail Creek Country Club, a private 36-hole course in Naples, Florida, superintendent Steve Durand applied CRUSADE twice in 1991. The first application was applied to the greens, tees, and fairways of nine holes during the third week of June. "The results in June were excellent, and the residual was outstanding," claims Durand.

As a result of the success of the first application, Durand applied CRUSADE to all 36 holes of his course late in September. "With other products, the residual doesn't seem to be as strong," Durand says. "From the results of the first application, I wasn't hesitant to buy a second time. The decision was easy."

## Extensive University Trials

Extensively tested in university experimental trials, CRUSADE provides effective control of many turf-inhabiting pests of economic importance such as chinchbugs.

The following are the results of a 1988 university trial on hairy chinchbug. Applying only 1 lb. ai/acre, CRUSADE delivered a full

98 percent control in the trial conducted in Ohio. The other control rates provided by CRUSADE during the trial are equally impressive.

University white grub trials from 1989 through 1991 in a four-state area also indicate exceptional results with CRUSADE.

### Hairy Chinchbug Control

Treatment	Lbs. ai/A	% Control		
		PA	OH	
CRUSADE 5G	1.0	—	98.0	
CRUSADE 5G	2.0	97.0	—	
CRUSADE 5G	4.0	98.0	—	
Mocap 5G	2.5	85.0	45.0	
Mocap 5G	5.0	93.0	83.0	
Triumph 4E	0.5	74.0	73.0	
Triumph 4E	1.0	67.0	93.0	

### White Grub Control

Treatment	Lbs. ai/A	% Control			
		WV (1989)	NY (1989)	IN (1991)	RI (1991)
CRUSADE 5G	4.0	100.0	83.6	100.0	96
Dursban 4E	4.0	—	—	67.86	—
Dylox 6.2GR	8.0	—	—	45.23	—
Mocap 10G	5.0	—	57.8*	100.00	—
Oftanol 1.5G	2.0	—	0.9	—	—
Sevin 7G	8.0	—	—	8.84	75
Sevimol 4SC	8.0	—	—	31.95	83
Triumph 4E	2.0	87.10	—	83.84**	—
Turcan 2.5G	2.0	—	—	—	66

\*Mocap 5G was used for this trial.

\*\*Applied at the rate of 1.5 oz./1000 sq. ft.

## Control in Bermudagrass

As a surface and subsurface turf insecticide, CRUSADE 5G has been developed for use on both cool and warm season grasses.

In a bermudagrass turf trial conducted at Texas A&M University, CRUSADE exhibited excellent grub control. In the trial, entomologist Robert L. Crocker, applied CRUSADE on September 20, 1991 to an area infested with grubs in the third instar stage.

Superintendent Jim McHenry also applied CRUSADE on bermuda-



grass at The Caroline Country Club in Denton, Maryland. Due to budget restrictions and the fact that pest problems

aren't always as apparent in bermudagrass, the 1991 application was the first on the club's fairways in more than six years. McHenry, who selected CRUSADE primarily because of its granular formulation, claims he saw almost immediate results.

Since his golf course is limited on fairway irrigation, McHenry applied CRUSADE early in the morning in mid-September when rain was predicted for that day, as well as for the following day. "Within 24 hours we saw grubs coming to the surface and dying," says McHenry. "In some places, the response was as quick as four to five hours."

While it can't be guaranteed that CRUSADE will deliver the exceptionally fast results witnessed at The Caroline Country Club, it is a product that will consistently provide effective, convenient and conscientious control. CRUSADE will repeatedly deliver the control that today's golf course superintendents demand and deserve.

And it's evident to anyone who uses CRUSADE: After years of research, testing and refinement, this new product is an efficacious and valuable tool for turf grass pest control.

For more information, call ICI Professional Products at 1-800-759-2500.



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Professional Products



# LAWN CARE INDUSTRY

## The key: being paid for the type of service we give, not just the products we apply

### Are there better terms to use than IPM?

■ Is the acronym IPM (integrated pest management) getting a little frayed around the edges? Is it beginning to show some gray?

After all, it's been around for decades. In agricultural circles it has. Only during the 1980s has it been used by professional turf and ornamental maintainers, with any regularity anyway.

"A lot of us don't understand if IPM is doing us harm or doing us good," says Tom Smith, president and owner of Grass Roots, Inc., Lansing, Mich.

Smith, for one, thinks the philosophy of IPM is still valid (see box). In fact, he says it's one of the cornerstones of his landscape design/build/manage company.

Even so, he admits IPM is, by definition, restrictive.

Professionally maintaining landscapes involves *a lot more* than pest control. "Sometimes our programs focus on pest management. We do it at the exclusion of good turf management," he says.

Are there better terms than IPM? Smith trotted out TEMP (Turfgrass Environmental Management Program), a term favored by Dr. Frank Rossi of Michigan State. Other professionals prefer PHC (Plant Health Care), and still others

CLM (for Comprehensive Landscape Management) or CTM (Comprehensive Turfgrass Management).

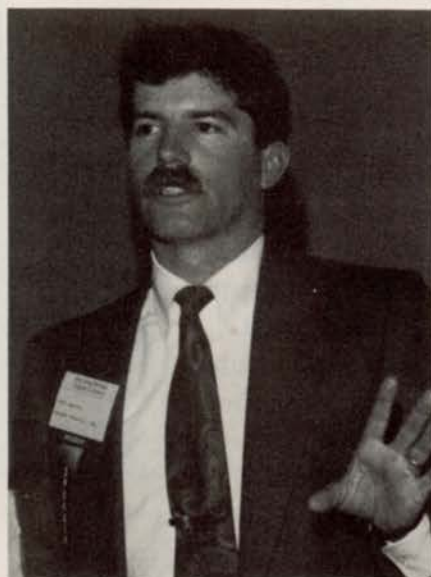
Any, if practiced, can justifiably be used as a marketing tool, says Smith. By using IPM—or any of its cousins—a turfgrass/landscape professional demonstrates that it takes specialized knowledge to nurture and maintain healthy and beautiful turfgrass and landscapes.

Semantics aside, Smith says he believes the industry sometimes sends the wrong message to its customers—that it expects to get paid only when it applies a product in conjunction with its services.

"How many other professionals will come out to your house, provide you with a management plan and not charge you for it?" asks Smith.

(Smith spoke about IPM at the Michigan Turf Conference last January.)

—Ron Hall



Smith says green industry shouldn't push products over good service.

### THE FOUR COMPONENTS OF IPM:

1. Initial inspection of lawn or landscape.
2. Development of a management plan for a particular site.
3. Monitor and treat the site based on the plan.
4. Evaluate and modify the plan.

### ELSEWHERE

**Tree, turf show hits Cleveland airwaves, p. 85**

**Mike Bailey works around the weather, p. 86**

**The four P's of training, p. 88**



# Cleveland audience wakes up to new upbeat tree & turf program

**This green industry duo 'puts its money where its mouth is' on a radio program devoted to good advice and good fun.**

■ Turn the dial of your AM radio to 1300 WERE Cleveland at 8 a.m. Saturdays to listen to a different kind of call-in garden show.

You'll be among the 10,000-plus listeners tuning into the shenanigans of Lauren Lanphear and Phil Fogarty in their weekly 1 1/2-hour tree-and-turf radio program, *The Root of the Matter*.

There's no question they're enjoying themselves, but the fun stuff is rationed out with larger doses of "how-to" advice on lawns, shrubs and trees. That's what listeners now expect from the two, not that they don't appreciate the duo's light-hearted approach to the subject matter. The program's rising viewer ratings show conclusively that they do.

"After all, the program's on at 8 a.m. Saturdays. If we want people to listen, we'd better be entertaining," insists Lanphear.

Lanphear, representing the Forest City Tree Protection Co., is the tree expert; Fogarty, from Crowley Lawn Service, is the program's resident lawn and ornamental guru. And—more often than not—Fogarty is a willing although sometimes unsuspecting straight man to Lanphear's good-natured wit.

The two try to make the call-in show entertaining even if they can't always make it humorous.

For example, when Lanphear took listeners on a weekly radio tour identifying different historic trees in Cleveland—those present when Moses Cleaveland founded the city in 1796—telephone calls to the station flooded in.

Many people asked for a list of the historic trees, while others suggested trees in their neighborhoods that Lanphear might add to the list.

(Cleveland, for many years was known as *The Forest City*, a nickname promoted by Leonard Case, a Cleveland mayor in the

1850s. The Forest City Tree Protection Co. was founded by Lanphear's grandfather in 1910.)

Then there are Fogarty's turf trivia quizzes, and Lanphear's "Arbor Jeopardy" segment.

Fogarty and Lanphear began their unusual radio partnership in June 1991, starting a 27-week run that ended in November. This past February, they kicked off a 39-week run for the 1992 growing season.

The two men "broker" the 1 1/2 hours of radio air time. They must come up with the money and material to make it work. They're helped by several sponsors, but admit they could use a couple more. Some of costs of the show come from their own pockets, they admit.

"I don't think either one of us ever saw it as a money-making deal," claims Lanphear. But they'd sure like to break even.

Typically, the two men alternate Saturday mornings at the radio station. The one that's not at the station will, sometime during the other's broadcast, telephone into the program for some chat and to answer some questions. Occasionally, both men will do a show together.

Local and even national guest experts are common. For example, Rod Tyler of Kurtz Brothers, a Cleveland-area company, is to talk about composting, while researchers like Dr. Wendell Mullison and



**Loren Lanphear took WERE listeners on a tour of historic trees.**

Dr. Tom Watschke all will be fielding questions from listeners sometime yet this spring.

"We can do it through a telephone hook-up," explains Fogarty. "They can talk to our callers. It sounds just like they're here in the studio."

Lanphear and Fogarty both admit that their motives for doing the program are—in addition to dispensing helpful information about landscapes/lawns and the green industry—business-based.

"It's a great way to give your company name credibility," says Fogarty. "And you immediately become the expert."

Adds Lanphear, "Our goal is to build our name recognition within the community."

Fogarty feels green industry business owners in other communities can develop equally successful shows.

"We (industry) could gain control of that hour every Saturday morning and talk about water quality as it relates to turfgrass, and talk about the benefits arising from the correct use of pesticides in lots of different markets," he says.

—Ron Hall



**Phil Fogarty says the radio station's ratings rose for the Saturday morning tree & turf program.**



# Everybody talks about the weather; Bailey's doing something about it

## Mike Bailey, owner of Super Lawns of Gaithersburg, seeks ways to work with weather, rather than against it.

■ The newspapers are soggy. Some are in yards while others are on driveways.

It's obvious to Mike Bailey, driving to his office in Montgomery County, Md., just north of Washington D.C., that many of the newspapers were delivered *after* residents returned home from work, *before* the rain.

Every copy of the newspaper is wrapped with a printed advertisement—a wet advertisement—for Mike Bailey's lawn care company, Super Lawns of Gaithersburg Inc.

"Even if I get just a percent or two response, we can close enough sales to make it worthwhile. But, now I think we're looking at a percent of a percent," he says with a touch—just a touch—of disappointment.

Even from the cozy fabric seat behind the wheel of his shiny gray GMC sport truck, Mike can't see any good coming from wasted advertising dollars. A lawn care business can go broke hoping for ideal weather, he knows.

Rather than wait for perfect conditions, Bailey, 35, a man of medium build with smoky blue eyes and, seemingly, inexhaustible energy, this past winter immersed himself in two weather-related business projects; this in addition to running the lawn care franchise he bought 14 years ago.

**Weather station**—On one hand, Bailey is putting the finishing touches on computer software for a portable weather monitoring system he will, later this season,

begin offering to other lawn/landscape professionals.

The model weather station, located in the yard behind his headquarters, is tied into his personal computer. At a keystroke, the station displays the barometric pressure, wind speed/direction, rainfall (daily and cumulative), air/soil temperatures, etc. Bailey's technicians access this information through the two-way radios in their service (pick-up) trucks. They record the data on the back of every service ticket.

Says Bailey, "This is the direction lawn care is going."

Increasingly, regulations require professional applicators to tailor and adjust

tion service to improve his company's growing seeding and sodding activities.

The heart of this service is a custom-built, wooden, crate-sized unit, a meticulously engineered collection of hoses and valves, controlled by a computerized, electronic timer. The company is building eight or 10 of these units, each about the size and weight of a full box of groceries. These irrigation devices will allow Super Lawns of Gaithersburg to keep clients' turfgrass green and alive, even in summer's heat.

Last summer's localized drought again demonstrated the importance of being able to work through unfavorable conditions, says Bailey. His company, in its full-service programs, says it will do all it can to keep clients' lawns attractive.

"Last summer we had to fess up. We had to deliver on our promises. And we had to do it at no extra cost to our customers," says Bailey.

That translated into a record-breaking season of aeration and seeding, mostly turf-type tall fescues. (Bailey, who has established turf plots adjacent to both his office and home, is particularly impressed with the continued performance of certain hard fescues for shady problem areas.)

Indeed, Super Lawns' full-service program (the so-called *Super Program*) is what, Bailey feels, sets

his company apart. It includes seeding, aeration, rolling, weed/insect controls, organic-based fertilizers—as many visits as it takes.

Bailey admits that 1991, mired as it was in recession, wasn't strong. He says his company grew. Barely.

This season, providing Mother Nature cooperates even moderately well, should be stronger, he's says.

"People aren't going to pave over their lawns," says Bailey.

—Ron Hall



Mike Bailey says the two-way radios he installed in every service truck have paid for themselves many times over.

their treatment programs to meet specific environmental conditions. They'll need more accurate and immediate local weather data, believes Bailey.

From a practical standpoint, charting and recording local weather conditions helps lawn pros better target weed, insect and disease controls, as well as improve irrigation efficiency, he says.

**Portable irrigation**—The other service he's initiating will, he's hoping, bring financial returns yet this season. It's an automated, portable, above-ground irriga-



## **ORTHENE® will keep unwanted pests off your turf.**

Trying to control a broad range of tough turf pests like mole crickets, fire-ants, fleas, chinch bugs and the worm complex is no day at the beach. That's why you should use ORTHENE.®

ORTHENE kills both on contact and with long-lasting systemic action, and

can be applied to lawns, ornamentals, shrubs, even trees. You can also combine ORTHENE with many miticides and fungicides for more effective pest and disease control with just one application.

ORTHENE is waterproof within 24 hours, and its chemical structure allows it to break down quickly, eliminating the threat of harmful buildup in the soil.

Throw a party your toughest turf pests will never recover from, with ORTHENE Turf, Tree and Ornamental Spray.

## **ORTHENE®** **Turf, Tree & Ornamental Spray**

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Circle No. 148 on Reader Inquiry Card

# THROW A KILLER LAWN PARTY.





# Lawn care PR: an active spring

■ The Professional Lawn Care Association of America (PLCAA) will be getting a report on the success of its spring public relations campaign soon.

PLCAA, through a committee headed by Bob Tracinski, and the support of Tracinski's employer, Deere & Co., distributed a "Grasscycling" public service announcement (PSA) to 250 television stations on March 9. Another 200 TV stations received PLCAA's National Lawn Care

Month (April) message on March 23. All were professionally produced.

Tracinski said the first of five spring radio PSAs was sent to 2,000 radio stations in March also. Different radio announcements will continue through April and May. They were sent to the stations via satellite.

DowElanco, Monsanto and Sandoz are helping PLCAA put together five radio PSAs for the summer. Meanwhile,

Tracinski says, three additional radio PSAs are being developed for fall 1992.

Also, about 3,000 publications along with 1,330 garden communicators received PLCAA's spring press kit.

Tracinski says the PSAs—which contain positive information about professional lawn service and helpful tips to homeowners—are generally welcomed by the media. And, the cost to PLCAA's budget is negligible.

## The four 'P's' of training

■ Michigan is one of the latest states to require training for lawn applicators. More states will likely implement certification and testing requirements.

Industry expects this to happen in spite of a national lawn care technician training program which has been in the planning stage these past two years.

The challenge, says Tim Doppel, Atwood Lawn Care of Sterling Heights, Mich., is for lawn care company owners and managers to develop *responsible* training programs.

"Welcome to the 1990s. You're not only in the lawn care business, you're in the training business," he told about 200 turf managers at the annual Michigan Turfgrass Conference.

Doppel offered the Michigan audience these four "P's" of a training program:

● **People.** Train to the level of your audience, says Doppel. Most training programs will probably have trainees with dif-

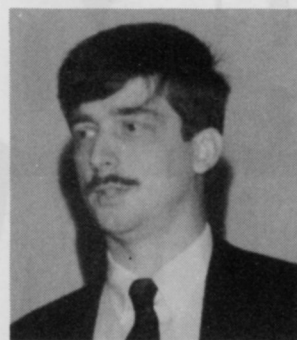
ferent education and experience levels. More experienced personnel will be more receptive to new information, whereas new hires know little about the industry.

● **Planning.** Provide trainees with an agenda, then stick to the agenda, Doppel says. "You can't do a good job of training your people if you throw your training program together the night before." Likewise, he adds, trainees should be given an opportunity to prepare for training.

● **Practice.** Good trainers practice what they're going to say and do, maybe in front of a mirror, maybe with a spouse as an audience. They do this before getting in front of trainees.

● **Place.** Have a suitable and comfortable location for training. If you don't have facilities at your business, consider renting space at a nearby hotel.

"You provide training fairly inexpensively," says Doppel. "It tells everybody that what you're doing is important. It tells



**Doppel:**  
Plan your training program.

your employees that they're going to get something out of the training program."

Some time-tested Doppel communication techniques: break technical and semi-technical subjects into easy-to-understand chunks of information, from 20 to 40 minutes each; tell anecdotes and relate your own real-life experiences as they relate to the subject; provide periodic breaks.

Equally important: treat trainees with respect. "Your employees are every bit as important as any other people you talk to," says Doppel. "They're your link with your customers.

## B&G'S NEW KP-4

Strap on the comfortable, lightweight KP-4 Knapsack Sprayer and enjoy the convenience and mobility it affords. Designed for a multitude of uses, the KP-4 is tough enough for *all* sprayable solutions.

Easy to use with the lever-operated high pressure continuous action pump. Only minimal effort is required to maintain effective spraying pressures. The generous 4 gal. high density polyethylene tank allows for an extended application period.

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- Unit converts for right or left hand operation.
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- OPTIONS**
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look healthy as well as handsome.

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# ONLY AMDRO® IS FORMULATED



Each year, fire ants spread further across the South, stinging millions of people. And professional Lawn Care Operators have seen the pain they cause to humans and pets and the damage to valuable lawns, plants and property.

## KILLS THE QUEEN. KILLS THE MOUND.

There are many fire ant products on the market. But the only way to REALLY get rid of fire ants is to kill the queen. Because only the queen produces more fire ants. So, when the queen dies, the mound dies.

And now, more and more professionals are protecting their customers' plants, ornamentals and lawns with AMDRO® insecticide fire ant killer. Because only

AMDRO is specifically formulated to kill the queen.

## HIGHLY EFFECTIVE BAIT FORMULATION

Fire ants treat AMDRO as food. They find it when they are foraging, carry it back to their mound, and feed it to ALL the ants in the mound...including the queen. Once the bait kills the queen, the whole mound dies in a matter of days.

## FOR BROADCAST OR SPOT TREATMENT

Nothing is as effective or easy to use as AMDRO. Just apply straight from the package. There's no mixing, no watering in, no dust, no mess. And unlike some other mound treatments, AMDRO has no offen-

sive odor. For established mounds, simply sprinkle AMDRO insecticide around the base of each mound, according to package directions. (Do not apply directly to the top of the mound.)

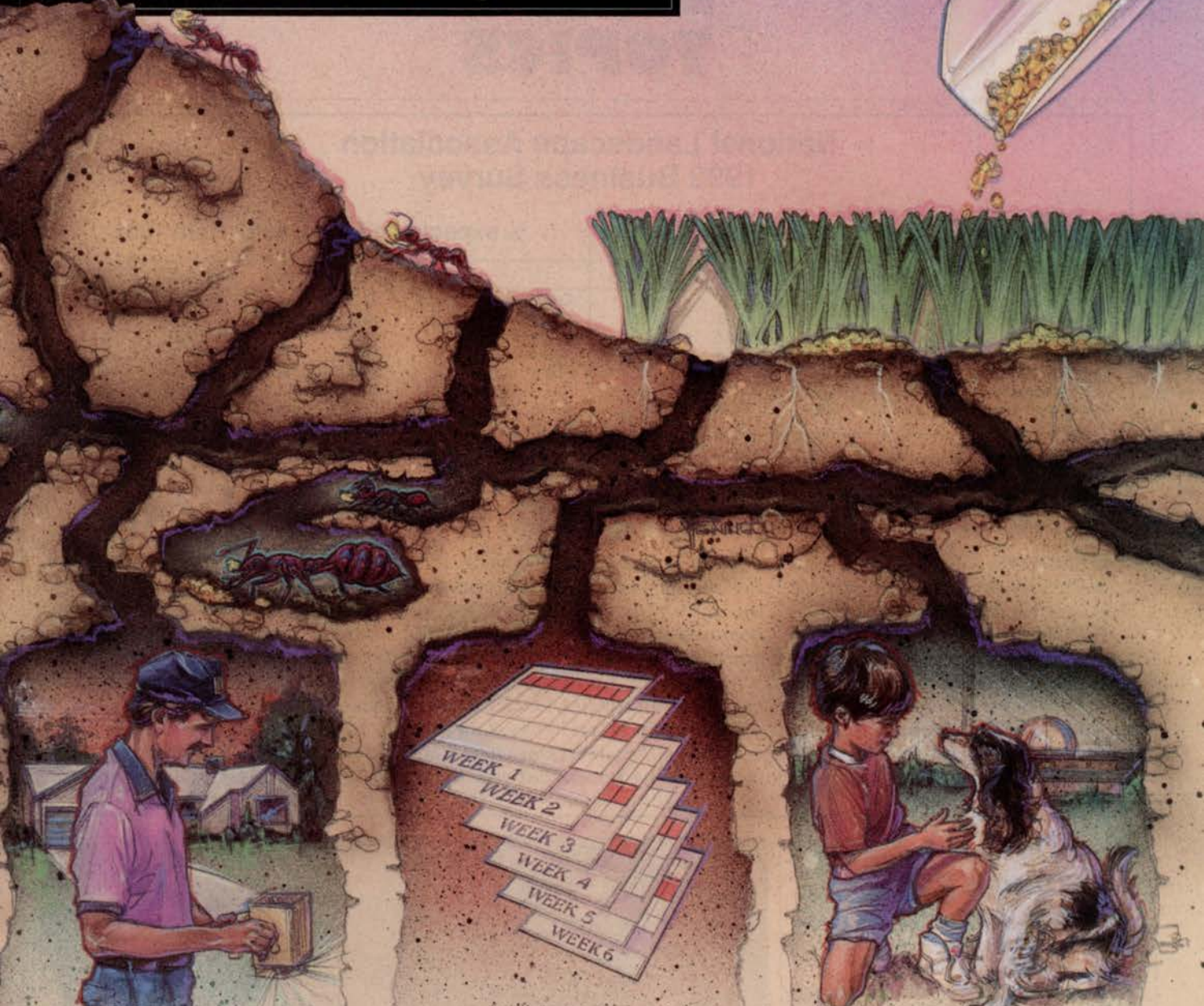
Or, you may use a hand-held applicator or vehicle-mounted Herd GT-77 spreader to broadcast AMDRO® over large areas to control existing mounds, as well as small, unseen mounds, and reduce the risk of reinfestation. Broadcast rates are only 1 to 1½ pounds per acre for total control.

## USE WITHOUT WORRYING

AMDRO® insecticide contains an exclusive patented biodegradable ingredient, hydramethylnon, incorporated into a highly



# ATED To Kill The Queen.



attractive and unique bait formulation. So, when the fire ants are gone, AMDRO is, too.

## THE CHOICE OF PROFESSIONALS

AMDRO is used by more lawn care

professionals than any other product. It's a very valuable, and profitable, additional service you can provide your customers. It's also easily incorporated into scheduled

treatments. So, protect your customers and their property from fire ants. Give them complete fire ant control with the only product specifically formulated to kill the queen. AMDRO. Available in 1-lb. containers, or economical 25-lb. bags.

### HOW AMDRO BEATS THE COMPETITION

Active Ingredient	Trade Name	Mode of Action	Low Odor	Low Dust	Ready To Use Broadcast	Toxicity To Birds, Honeybees	Pasture or Rangeland	Leaching Potential	Time Required For Control
hydramethylinon	<b>AMDRO®</b>	BAIT Ingestion (Stomach Insecticide)	Yes	Yes	Yes	Low	Yes	Low	7 Days
fenoxycarb	<b>Logic<sup>1</sup></b>	BAIT Growth Regulator (Stops egg laying)	Yes	Yes	Yes	Low	No	Low	3-5 Weeks
avermectin	<b>Affirm<sup>2</sup> Fire Ant Ender<sup>3</sup> Ascend<sup>4</sup></b>	BAIT Growth Regulator (Stops egg laying)	Yes	Yes	Yes	Low	No	Low	6-8 Weeks
acephate	<b>Orthene<sup>5</sup></b>	CONTACT	No	No	No	High	Yes*	Moderate to High	3-7 Days
diazinon	<b>Spectracide<sup>6</sup> Green Light<sup>7</sup></b> (various others)	CONTACT	Yes	Yes	No	High	No	Moderate	Immediate
dursban	<b>Green Light<sup>7</sup></b> (various others)	CONTACT	Yes	Yes	No	High	No	Low	Immediate

(\*grazing restrictions apply-see label)

<sup>1</sup>Trademark, American Cyanamid Co. © 1991 <sup>2</sup>Trademark, Maag Agrochemicals, Inc. <sup>3</sup>Trademark, Merck & Co., Inc. <sup>4</sup>Trademark, S.C. Johnson & Son, Inc. <sup>5</sup>Trademark, Whittemore Research Laboratories, Inc. <sup>6</sup>Trademark, Chevron Chemical Co. <sup>7</sup>Trademark, The Spectrum Group. <sup>8</sup>Trademark, Green Light Chemical Co.



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# HOT TOPICS

## National Landscape Association 1992 Business Survey

	% change in business, 1991 from 1990				% expected change, 1992 from 1991			
	NE	SE	Gr. Lks.	Plains	NE	SE	Gr. Lks.	Plains
Overall sales	-9.2	-1.1	-1.3	-0.5	+5.0	+4.9	+14.3	+6.9
New residential	-4.7	-6.9	-1.6	-1.8	+5.8	+4.0	+11.9	+6.1
New commercial	-12.8	-10.5	-10.8	-4.9	+3.6	-10.3	+2.0	-3.1
Res. renovation	-0.9	+2.8	+3.6	+1.6	+6.5	+5.4	+10.3	+7.1
Comm. renovation	-4.7	-1.1	-1.2	-3.3	+2.9	-6.9	+4.1	+0.1
Res. maintenance	+2.7	+3.7	+7.4	+1.4	+9.4	-2.1	+6.7	+3.7
Comm. maintenance	-1.4	+6.9	+12.8	+0.2	0.0	-5.6	+7.4	+4.1

### '92 landscape outlook:

## Optimism...tinged with caution

**WASHINGTON**—A National Landscape Association survey projects that 1992 will show improved sales for the industry.

The NLA's annual economic survey of member firms indicates an expected overall increase of 8 percent in landscape sales for 1992 over 1991. The sharpest increases are expected in new residential landscaping (8.1%), residential renovation (8.0%) and residential maintenance (5.3%).

"With increased sales effort and greater emphasis on good management practices, the probability of 1992 resulting in improved sales is good," the NLA told members in its March/April newsletter.

However, last year's actual figures were much less than expected, for only the second time in the 17-year history of the survey. Overall, members predicted an increase of 4.4 percent last year while

business actually *decreased* 3.3 percent from 1990 to 1991.

Hardest hit was new commercial business, off 9.3 percent nationally from 1990. However, nationwide, commercial (+5.3%) and residential (+4.1%) maintenance both showed growth in 1991.

Landscapers in the Great Lakes region are most optimistic, predicting 14.3 percent growth this year.

### Government, industry push 'Don't Bag It'

**GREENFIELD, Wisc.**—This city is cooperating with local industry to introduce a program called "Don't Bag It."

Mayor James Besson, at a news conference in March, encouraged citizens to reuse grass clippings as lawn nutrients rather than bagging them for landfills.

BFI Waste Systems underwrote development costs. A public drawing was held to determine winners of (1) one year's use of Toro Recycler lawn mower and (2) a year's supply of Slo Grow lawn fertilizer.

Ryerson Co. provided the mowers, and Howard Johnsons Enterprises provided the lawn fertilizer.



Greenfield Mayor James Besson (right, at microphone) announces the city's 'Don't Bag It' campaign while local news media record the event.

### ELSEWHERE

**Effluent water gets a boost, p. 93**

**NAA airs concerns with VP Quayle, p. 93**

**Asian gypsy moth could invade U.S., p. 93**

**New PGR hailed for landscape, golf, p. 94**



## Golf greens get flush treatment

**COLUMBIA, Mo.**—Golf greens of the future may offer the final stage of sewage treatment, at least in arid areas, say researchers at the University of Missouri here.

"At present, 10 percent of golf courses in the southwestern U.S. are irrigated with treated domestic sewage," says turfgrass specialist John Dunn. "Within the next 20 years, that should increase to 100 percent."

"Golf greens are ideal for tertiary sewage treatment because the dense mat of grass roots absorbs excess nutrients from the treated effluent," he says.

Dunn and grad student Tom McKay aim to deal with negative public perceptions of recycled sewage water. They are comparing turf treated with both sewage and drinking water. They are also comparing irrigation by sprinkler with irrigation through porous pipes laid under the green.

"It's too early to reach firm conclusions," Dunn says. "But we have found no difference in green quality water since the turf was laid last fall. Only time will tell if we will get problems with the pipes blocking from lime build-up, effluent particles or root hairs."

### CLARIFICATIONS

■ Weights of Hoffco string trimmers listed on page 30 of the March issue referred to shipping weights, which include the weights of all accessories. Other equipment listed carrying weights.

■ Another article in that issue incorrectly noted that cyfluthrin has not yet been approved for control of Lyme disease ticks in New York. The insecticide is marketed in two formulations, under the trade name Tempo, by Miles. Its wettable powder was approved for the above use in April, 1991; its 2EC formulation was approved in August.

■ A chart on page 62 of that issue incorrectly noted that Turflon D, Turflon II and Confront herbicides were manufactured by Dow. They are, in fact, manufactured by DowElanco.

■ Lynda Wightman, contrary to what is stated on page 52 of the March issue, is an employee of Hunter Industries, based in San Diego.

LANDSCAPE MANAGEMENT regrets the inaccuracies.



Vice President Dan Quayle (left), NAA executive president Bob Felix.

## White paper on tree benefits helps NAA reach top government levels

**AMHERST, N.H.**—In a brief meeting here in February, the National Arborist Association presented Vice President Dan Quayle with a whitepaper titled "The Importance of Large Tree Maintenance in Mitigating Global Climate Change."

NAA executive president Bob Felix made the presentation, on behalf of the organization's membership.

The research document was prompted by concerns that President George Bush's "America the Beautiful" program focuses

on new plantings and does not adequately address the need to maintain mature, healthy trees.

The NAA has also distributed the whitepaper to the U.S. Congress, state foresters and urban foresters across the nation. The document was funded by a grant from the National Arborist Foundation.

For more info, or to receive a copy of the whitepaper, contact NAA at (800) 733-2622.

## AAN says Asian gypsy moths are very real threat to landscape plants

**WASHINGTON**—Since last November, the American Association of Nurserymen has been working with key members of the U.S. Congress to try and thwart a potential problem with the Asian gypsy moth that could affect the landscape industry.

According to a press release, the AAN's efforts "have been successful, in that the USDA's Animal and Plant Health Inspection Service, in conjunction with the USDA Forest Service, has developed a comprehensive treatment and eradication plan to prevent infestation. We are now working to urge that this important preventive plan be funded."

In 1991, Asian gypsy moths were found on ships in the northwest U.S. The ships had presumably picked up the insects at

Siberian ports of call.

Asian gypsy moth is of the same species as the gypsy moth that was introduced in the U.S. years ago. However, the Asian strain differs in that:

- females are capable of flying up to 65 miles whereas the "North American" female does not fly;

- it appears to feed more readily on a much broader range of plants, and may establish more readily on conifers; and

- it has the potential to spread much more quickly.

According to the AAN's report on the subject, introduction of the Asian gypsy moth here could mean an alteration in wild animal (and endangered species) habitats.



## UAP redirects turf activities

**SALEM, Ore.**—United Agri Products (UAP) restructured its professional turf and ornamental efforts with the formation of United Horticultural Supply (UHS).

All UAP activities in the professional turf and ornamental markets (including UAP Special Products) will come under this new organization. Markets being served by UHS include: commercial lawn care, golf course, landscapers and landscape maintenance, ornamental horticulture, etc.

Initially, UHS will be made-up of six divisions owned and operated by the geographically diverse United Agri Products Independent Operating Companies.

## New PGR to be tested widely this summer

**GREENSBORO, N.C.**—Primo, an experimental plant growth regulator, can manage growth and quality of warm- and cool-season turfgrasses, according to its maker, Ciba-Geigy.

The product was field-tested for the first time in 1991 on 300 acres of turf. It will be sold this season with its recently-approved Experimental Use Permit. Up to 3,000 test acres of turf are planned.

According to Ciba-Geigy, Primo will be especially useful in managing difficult-to-mow areas and to minimize edging along sidewalks, curbs, parking lots, driveways, flower beds and fences; and around posts, storage sheds and trees.

Primo is planned to be labeled for bentgrass, Kentucky bluegrass, red fes-

cue, tall fescue, annual and perennial ryegrass, bahiagrass, common and hybrid bermudagrass, centipedegrass, St. Augustinegrass and zoysiagrass.

At standard application rates, Primo will provide approximately 50 percent growth reduction for four weeks, Ciba-Geigy's Dr. Doug Houseworth says. With multiple applications, Ciba-Geigy believes that Primo will be able to reduce turfgrass growth the entire growing season—but not more than 2.7 lbs. of Ai/A can be applied per year.

Its active ingredient is cimectacarb.

For best results, Ciba-Geigy says, Primo should be applied to high quality turfgrasses which receive adequate moisture and fertility.

## INFO CENTER

### Useful literature and video offered to LM readers

**ON TURF DISEASES...**The "Compendium of Turfgrass Diseases, Second Edition" is now available from APS Press. Detailed descriptions and more than 180 full-color photos (60 of them new) help diagnose and control more than 50 turf diseases. The 128-page softcover book—edited by Richard W. Smiley, Peter H. Dernoeden and Bruce B. Clarke—is \$25 in the U.S. and \$31 elsewhere. To order, send check or money order to PAS Press, 3340 Pilot Knob Rd., St. Paul, MN 55121-2097 or phone (800) 328-7560.

**GOLF COURSE PERSONNEL...**A sample handbook for setting policy, writing job descriptions, developing pay scales and other golf course personnel management issues is now available from the GCSAA for \$10 (members) or \$15 (non-members). Topics include employment status, work schedules and pay, attendance, standards of conduct and job descriptions. The handbook is available through the GCSAA, phone (913) 832-4480.

**HEALTHY TURF...**"Healthy Turf Means Healthy Earth," a color brochure from The Fertilizer Institute, is available for \$1.25 per copy. The brochure, which can be distributed to customers, answers questions like "how does one know how much fertilizer to use?" and "are organic fertilizers

safer than commercial fertilizers?" A 10% discount applies to orders of more than 100. To order, send check to TFI, 501 2nd St. NE, Washington, DC 20002.

**TURF BENEFITS VIDEO...**"This Precious Earth" is a new six-minute videotape program produced by the American Sod Producers Association. In addition to the educational program, a group of four 30- and 60-second public service announcements are included, along with a four-color brochure that complements the video. The video costs \$25. The brochures cost \$75 for 500 or \$250 for 2,000, plus shipping and handling. For more info, contact Terri Berkowitz, at ASPA, 1855-A Hicks Rd., Rolling Meadows, IL 60008; phone (708) 705-9898.

**CHEMICAL SAFETY...**A new handbook by the Midwest Plan Service aids chemical safety: "Designing Facilities for Pesticide and Fertilizer Containment." Major chapter headings include site selection, system design, worker safety areas, mixing/loading areas, emergency response practices, etc. The book is available for \$15. Phone Art Muehling at (217) 333-9313 or send check to: Plan Service, Dept. of Ag Engineering, 1304 W. Pennsylvania Ave., Urbana, IL 61801. Make checks out to the University of Illinois.

**GREENS MOWING...**Jacobsen now offers a videotape training guide for the Jacobsen Greens King IV. It is available in Spanish or English from local Jacobsen distributors or by writing Jacobsen division of Textron, 1721 Packard Ave., Racine, WI 53403.

**MORE HEALTHY LAWNS...**Lofts Seed has created a new, free booklet for lawn care customers entitled "The Grass is Always Greener on My Side." Filled with illustrations and color photos, the 16-page booklet offers tips on selecting seed and mowing and watering. The booklet also offers a \$1 coupon toward Lofts products. For more info, call Mary Anne Rohmann or Krystal Stilwell at (212) 684-6300.

**PROTECTING YOUR BUSINESS...**"How to Protect Your Business" is now available through the Council of Better Business Bureaus. Price is \$7.95 for the pocket-size paperback edition, \$14.95 for deluxe softcover, plus \$2 shipping and handling. It has three sections: Schemes Against Business, External Crime and Internal Crime. Covered are office supply schemes, bankruptcy fraud, telemarketing crimes, credit card fraud, embezzlement, insurance fraud and more. Send order and payment to: CBBB Publications, 4200 Wilson Blvd., Arlington, VA 22203.





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Growing Better Through Technology



## CUSTOMER SERVICE TIPS

### Customer Service Training

by Ed Wandtke

■ One method of helping lawn service company employees realize the owner's commitment to quality customer service is to provide specific training. In developing a customer service training program for your company, examine the following:

**1.** Determine where training is needed. You will need an internal and external written philosophy for your company explaining how you expect customers to be treated. With this philosophy in mind, you will need to identify what aspects of customer service your company needs to be changed.

**2.** Ask for employee opinion. Ask them where they believe more training is needed in areas of customer service.

Employee participation helps to improve the receptiveness and effectiveness of the training. Encouraging employee input may also help you discover where additional training is needed.

**3.** Make training a pleasant experience. Avoid developing a customer service training program as the result of employee and customer turnover. Putting employees under pressure to perform improved customer service often backfires. A relaxed atmosphere of both training and implementing improvements in customer service will result in more effective benefits to the company. Training geared to your employees' ability will be more effective in the long run.

**4.** Make training interactive and participatory. Employees need to be taught effective customer service techniques and have them applied to problems they deal with on a day-to-day basis. Let them try out what they've learned, by presenting them with specific problems in the class.

Customer service training needs to be provided for every employee in your company. Making this commitment will increase both employee and customer retention.

## GREEN INDUSTRY EVENTS

### MAY

**21:** Barney Barron/Turfage Athletic Field Clinic, Recreation Center, Commerce City, Calif. Contact: Dan Melchior, L.L. Johnson Distributing, 4700 Holly St., Denver, CO 80216; (303) 320-1270.

### JUNE

**10:** Lofts Field Day, Lofts Seed Research Farm, Chimney Rock Road, Martinsville, N.J. Contact: Lofts Seed at (800) 526-3890 or (908) 560-1590.

**12-13:** Florida Nursery Growers Association annual meeting, Indian River Plantation, Hutchinson Island, Fla. Contact: FNGA, 5401 Kirkman Road, Suite 650, Orlando, FL 32819.

**14-17:** AABGA annual meeting, Botanical Gardens & Arboreta of Ohio, Columbus. Contact: C.W. Eliot Paine, Holden Arboretum, 9500 Sperry Road, Mentor, OH 44060; (216) 256-1110.

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**West**  
**August 20, 21, 1992**  
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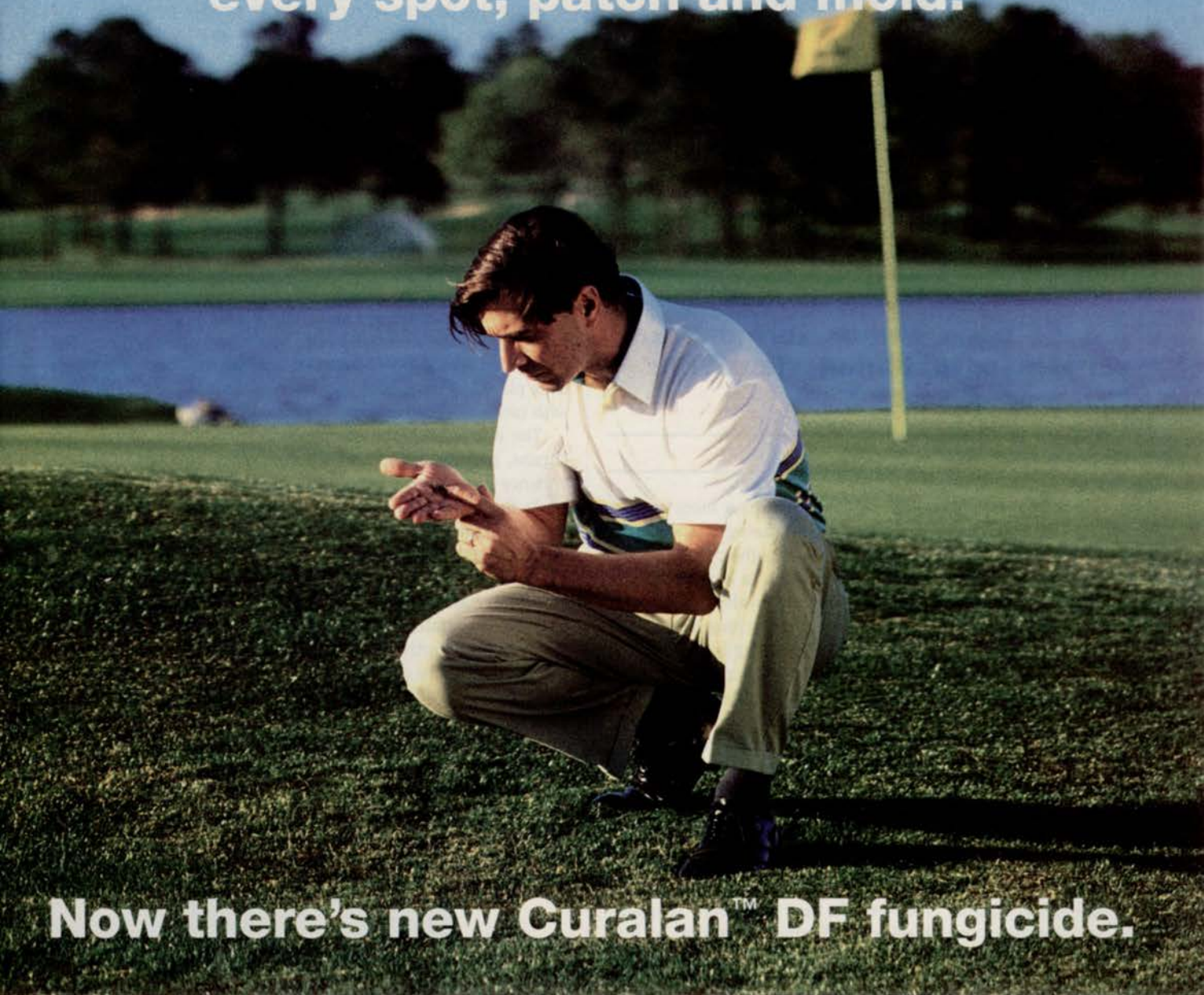
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# JOB TALK

## Landscaping as a marketing tool

**It's the trees, shrubs, turf and seasonal color that bring visual 'life' to a property.**

by Andy Hull

■ Scientific studies show that office workers have more positive attitudes and outlooks when creative landscaping sets a tone of order and tranquility. Their motivation is higher; their performance is greater; and they are more efficient. As a parallel, there is less employee turnover, more company loyalty, and greater corporate effectiveness and profitability over the long haul.

In such circumstances, intelligent landscaping becomes a "living" relief valve for the firm's personnel. Compared to other efforts and investments, imaginative landscaping can be reasonably priced and easily acquired.

Consider these not-so-hypothetical scenarios. With slightly less effort, a modern office park's foliated courtyard with pool and fountain might, alternatively, have remained a vacant, weed-infested lot. A commercial building's gracefully curved, graveled entrance, with a cozy seating arbor, could have just as well become a non-descript concrete slab. A suburban shopping mall's flagstone, fern-bordered drainage swale—often creating an intriguing wet-weather creek—might have easily been supplanted by a masonry trench with rusty mesh covering. In less thoughtful hands, the orderly treelines and manicured hedge rows that frame a medical complex could have just as well succumbed to an asphalt apron.

Instead of neglected, ho-hum surroundings, the exteriors of these structures have become harmonious collections of "value-added" amenities: places where a computer programmer can take a break; where a businessman can pause for a breath of fresh air and fresh point of view.

**Sell the beauty**—Well-ordered, visually arresting landscaping also gives customers, prospects, suppliers and visitors a more positive impression of the building's developers/owners and clientele. The first impression is often the lasting one—the long-held attitudes that form about a company's corporate culture, its sense of order and decorum, its taste level and operating style.

Yet, over the past 20 years of land planning, landscape design, landscape installation and maintenance for the 16,000 apartment homes of our parent company, Post Properties, we've discovered even more benefits. For Post's apartment residents, the lush landscapes and colorful year-round foliage stands as a corporate trademark. While a beautiful label cannot sell an empty package,

a quality product assuredly cannot sell itself with an ugly one.

Strategically placed trees not only provide protective shade from the sun, but their foliage serves as air filters and purifiers. Properly installed ground covers and turf tend to filter rainwater impurities before they reach the ground water systems.

**Using existing surroundings**—In developing Parkwood Circle of Atlanta, the main office facility was strategically placed near the bottom center of the tract to accommodate the semblance of a white water creek tumbling past its entrance into a manmade lake below. A nearby hillside was deeply graded to allow the partial subterranean placement of a three-level parking plaza. The front of the structure was planted with lush foliage which hung downward in a Tivoli Gardens effect. The back wall was literally buried into the hillside.

Other hilly terrain was systematically terraced and implanted with culverts and drainage swales which prevented surface flooding and erosion. A mile-long semi-circular roadway was strategically placed to transverse the inner borders of the development, with two landscaped entrances/exits on Powers Ferry Road.

The entire property was planted with a profusion of trees, shrubs, ground covers and seasonal color selected to visually enhance the natural appeals of the terrain.

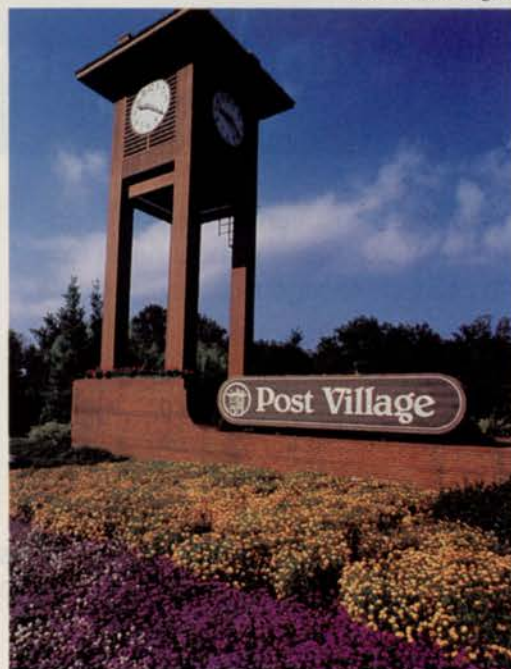
As the newly-controlled surface water filled the lake, a recirculating pump keeps the water flowing through the shoals at the building's entrance, providing an intriguing focal point for tenants and visitors.

**Added value**—Apart from the resale value that landscaping adds to real estate, it also puts the property—and your role in it—in a more positive public light. These are the types of properties pointed out by city fathers on VIP tours, the landmark references used in media reports on local happenings, the photos in Chamber of Commerce catalogues.

In these associations you become a community booster, an environmentalist, a concerned corporate citizen whose efforts to "put something back" nets you even more.

—The author is vice president of Post Landscape, Atlanta, Georgia

**Beautifully landscaped property makes a good first impression on any potential buyers, tenants and visitors.**

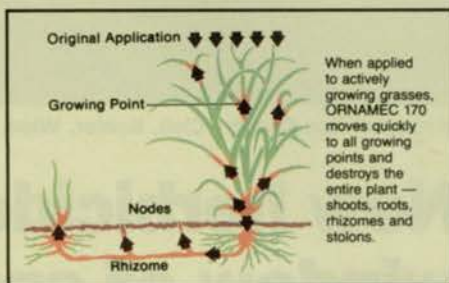






The above photo, taken in Birmingham, Alabama, is indicative of the landscaping beauty spots that are now economically feasible, thanks to Ornamec 170.

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.



# Introducing the new, improved Ornamec® 170 the ultimate over-the-top post-emergent grass herbicide

We have specifically formulated, packaged and priced the new Ornamec 170 to fit the needs of landscapers today. Read how it now further eases your work and reduces your costs.



**Everett Mealman,**  
Chairman and  
Chief Executive Officer  
PBI/Gordon Corporation

When landscapers talk . . . we listen. You said you wished that Ornamec had its own built-in non-ionic surfactant; that it was packed in a variety of sizes to fit your needs; and was priced to help you manage inventory costs.

You asked for it. Here it is: The new, improved Ornamec 170. The ultimate over-the-top post-emergent grass herbicide!

■ Spray it over the top of more than 400 ornamentals and flowers without danger



Ornamec® is a registered trademark of PBI/Gordon Corporation.

of plant injury. Clean out nearly all of the major species of unwanted grass, including tough perennials such as bermudagrass, quackgrass, seedling and rhizome johnsongrass and torpedograss, along with barnyardgrass, crabgrass, and foxtail.

■ It's packaged in gallons, quarts, and 10-ounce sizes. The quart makes up to four gallons of spray solution, ideal for back-pack units. Using the 10-ounce size you can mix up a gallon and a half of spray solution, adequate for approximately 1,500 square feet of coverage. It is so convenient you can carry it with you at all times; and if you happen upon a place where ugly grassy weeds are invading one of your beauty spots, you can easily mix up a sprayer full of Ornamec 170 and clean it up right now!

Why tie up your money in large inventories when job-sized containers of Ornamec 170 are now available? With only about \$3.50 or so invested in the 10-oz. size, can you afford not to check it out?

**This \$95-Value  
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only \$49.00**

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- Built-in carrying handle



To get this \$95.00-value SP-1E Back-Pack Sprayer for only \$49, buy one gallon, four quarts, or a case of twelve 10-oz. bottles from your distributor between now and July 31, 1992. Limit one offer per customer. Available through participating distributors or direct from PBI/Gordon with \$5.00 shipping and handling. To order direct, send proof of purchase and your check for \$54. Mail to PBI/Gordon Corporation, P.O. Box 4090, Kansas City, MO 64101. Delivered via UPS. No requests honored after August 30, 1992. Offer good while supply lasts.

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# GREEN INDUSTRY SHOWCASE



Blackwolf Run Country Club, Kohler, Wisc. shows the efficacy of Dimension herbicide when used for crabgrass control.

## New herbicide has wide window of application

Many herbicides are available to control crabgrass and other annual grasses in cool-season turf. Until recently, however, golf course superintendents and lawn care operators have often had to compromise weed control for turf safety.

Narrow application windows have compounded this problem. The registration last summer of Monsanto's Dimension turf herbicide by the Environmental Protection Agency will, the company believes, make the product a welcome tool in the arsenal against weed control.

Dimension is formulated as a 1 lb. active ingredient per gallon emulsifiable concentrate (IEC). According to Monsanto, Dimension is part of a new class of herbicide chemistry developed by the company.

The active ingredient, dithiopyr, enters plants through crowns, roots and shoots, inhibiting cell development and growth. The major site of physiological activity is within developing plant meristems found in roots and shoots of susceptible plants.

Prior to registration by the EPA in June 1991, the herbicide had undergone several years of extensive laboratory and field testing. Under an Experimental Use Permit (EUP), dithiopyr was examined by major universities and tested in commercial field trials across the United States.

**Use for pre-emergence control—**Applied as a pre-emergence control, dithiopyr controls both large and smooth crabgrass as well as other annual grass species such as barnyardgrass and foxtail. Broadleaf weeds controlled include chickweed, shepherdspurge, corn speedwell,

henbit, prostrate spurge and yellow wood-sorrel.

**Works in competitive turf—**According to Monsanto, Dimension has proven effective when applied as a pre-emergent to control goosegrass in the southern U.S. In highly competitive turf, dithiopyr provides good goosegrass control at a rate of 2 qts. per acre. Less consistent results may occur with heavy goosegrass pressure at the 2 qt. rate. Dimension controls many grasses and broadleaf weeds, but research has focused primarily on pre-emergence control of crabgrass. At the recommended rates of 0.25 lbs. (1 qt.) to 0.50 lbs. (2 qts.) active ingredient per acre, trials have shown preemergence crabgrass control consistently averaging above 90 percent.

In 1989 trials at Penn State, dithiopyr provided control of 96 and 97 percent when applied as a pre-emergent, at rates of 0.38 lb. ai/A and 0.50 lb. ai/A, respectively, with data collected 145 days after treatment. Performance was decreased only slightly when the product was used at a rate of 0/25 lb. ai/A. In trials at the University of Massachusetts, the herbicide provided more than 90 percent control of smooth crabgrass at the 0/25 lb. ai/A rate in studies done from 1987 to 1990. Trial applications were made from April 20 to May 10 during those years.

Post-emergence applications of Dimension can also be effective, says Monsanto, and it sites studies at the University of Massachusetts. There, 90 percent control of treated crabgrass was achieved in the one- to four-leaf stage, with 1-1/2 quarts (0.38 lb.) to 2 quarts (0.5

lb.) of product per acre. Control dropped significantly at this rate when dithiopyr was applied alone to tillering crabgrass 2 to 4 inches tall with multiple plants.

University rooting safety studies have shown dithiopyr does not affect established turfgrass roots. In these studies, turfgrass roots were harvested, weighed and measured after application of the product.

Research at the University of Maryland, conducted on "Palmer" perennial ryegrass, confirmed the safety of dithiopyr to root systems. Dry weights for roots harvested 30 days after a 0.5 lb. ai/A treatment with dithiopyr were 171 milligrams. When roots were collected 60 days after treatment, root weight decreased to 158 milligrams. Trials on "Penncross" creeping bentgrass, conducted at the University of Maryland, also supported the rooting safety of Dimension.

In those trials, roots of turfgrass treated with dithiopyr at a rate of 0.5 lb. ai/A had root dry weights of 96 milligrams 60 days after treatment.

Untreated turfgrass roots yielded a weight of 82 milligrams after a 60-day period.

**Opening the application window—**Dimension can be applied alone for both pre- and post-emergence crabgrass control. This flexibility, characterized by its early post-emergence activity and long residual control, combines to stretch the application window.

Monsanto reports very good residual control. One application at a 0.5 lb. ai/A rate controls crabgrass and other weeds for the entire season.

Data from Massachusetts indicates that dithiopyr will control crabgrass above the 90 percent level for six months in established Kentucky bluegrass and perennial ryegrass turf.

**Circle No. 191 on Reader Inquiry Card**



# *Fireworks and fanfare are signaling in the new generation of world class fine fescues.*



*Enjoy, Cindy and Longfellow are the dynamite trio of low maintenance fine fescues that provide environmentally sound answers to some of the tough turf problems in parks, home lawns, industrial complexes, roadsides and reclamation areas.*



## **ENJOY**

CHEWINGS-TYPE RED FESCUE

Enjoy Chewings Fescue is a dark green, very fine leaved variety with excellent resistance to red thread, fusarium blight and leaf spot. It is an impressive performer, developing a dense sod that stands up to hard use and will require less fertilizer and fewer mowings.



## **Cindy**

creeping red fescue

Cindy Creeping Red Fescue, like its low maintenance companions, forms a dense upright growth of rich color that shows a marked persistency even under low fertilization regimes. One of the finest creepers available today, Cindy has the turf quality of a chewings fescue and is equally at home in sun or shade.

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Longfellow Chewings Fescue is a tough competitor that consistently ranks among the top varieties in National Fine Fescue trials. Its vibrant, dark green turf has low thatch buildup and excellent tolerance to environmental stresses.

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Circle No. 117 on Reader Inquiry Card



# PRODUCT REVIEW

## EPA approves fungicide in water-soluble packet

The Environmental Protection Agency has approved a new formulation for turf of Ciba-Geigy's Subdue fungicide.

Subdue + WSP combines Subdue's disease control in a water-soluble package.

"We listened to turf managers' concerns, and we think Subdue + WSP's package helps the industry address those concerns head-on, says Owen Towne, Ciba-Geigy product manager.

The product controls Pythium blight and Pythium damping-off in all turf species, yellow tuft in bluegrass, and downy mildew in St. Augustinegrass.

"Our original Subdue has been an effective turf fungicide for several years," says Towne. "The new formulation offers an alternative that features less potential applicator exposure and easier container disposal."

Subdue + WSP is packaged in a 20-ounce water-soluble bag, which comes in a standard cardboard box. To mix, drop the bag into a water-filled spray tank and agitate. The bag and fungicide dissolve quickly and completely.

**Circle No. 192 on Reader Inquiry Card**

## Spray head features built-in nozzle with adjustable arcs

Hunter's S-type spray sprinkler with built-in nozzle is designed for use on small



turf and landscape areas. It is available with adjustable arcs to vary the radius and discharge rates, and as a fixed, full circle sprinkler. The adjustable arc feature allows the user to more precisely match irrigation coverage to garden design.

S-Type models include 2" or 4" pop-ups, a shrub head and a side strip sprinkler. Depending on the model employed, the S-Type radius may be varied from 3' to 19' and the discharge may be adjusted from 1/2 to 5.3 gpm.

The discharge rate increases automatically as the arc of the coverage is increased. The radius may be adjusted independently of the arc while maintaining matched precipitation between all models.

**Circle No. 193 on Reader Inquiry Card**

## New modular design for hazardous waste storage

Landscape contractors, lawn care operators and golf course superintendents often find they have too-little storage space for control products or other liquids.

A series of modular hazardous materials storage buildings designed to permit more storage in less space has been developed by Shields Mfg., Oxnard, Calif.

"The modular system provides palletized depth, which makes for space efficiency," says Gary Van Valkenburgh, vice president.

The modular designs provide building in increments, in bays of 5 to 25 feet. Larger buildings are possible if the need is there.

The modular system has received Factory Mutual approval, and can be provided with fire-proofing and/or fire suppression systems.

An advantage of the modular system, according to Shields, is the capability to match end-user shelving requirements as needed, and still permit easy access to the interior.

**Circle No. 194 on Reader Inquiry Card**

## Water-conserving spikes cut waterings by 50 percent

Soil Moist spikes without fertilizer are available in packages of 250 each from JRM Chemical, Cleveland, Ohio.

JRM says the spike is a safe, non-toxic polyacrylamide that will store more than 100 times its weight in tap water.

The spike releases a steady supply of water as needed by the plant.

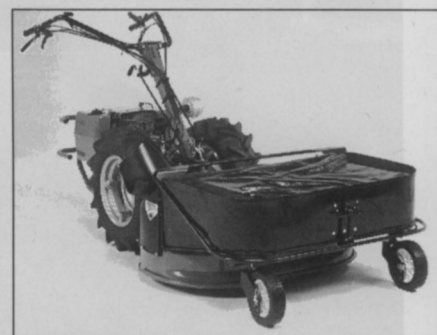
According to JRM the spike will help reduce turf waterings by as much as 50 percent.

**Circle No. 195 on Reader Inquiry Card**

## Mower is designed for large commercial applications

The 745 commercial mower from BCS America, Inc. is designed for large-scale commercial work.

The mower runs off of a 14-hp Kohler



engine, with five forward and two reverse speeds. A 33-inch rear tine tiller is also available.

The model 745 features commercial construction throughout, from its all-gear transmission to heat-treated ball-bearing mounted shafts for long life.

A heavy-duty clutch absorbs shocks and eliminates the need for power-robbing belts. A low center of gravity provides uneven terrain.

**Circle No. 196 on Reader Inquiry Card**

## Two-cycle oil burns entirely in combustion chamber

A new brochure from the Shaler Company describes the benefits of Rislone Premium Quality 2-cycle oil.

According to Shaler, just one oil/gas mixture meets the needs of most air-cooled, 2-cycle engines, including weed trimmers, chain saws, leaf blowers, power mowers and garden equipment.

Formulated with premium quality components, this oil burns completely in the combustion chamber.

Complete chamber burning eliminates noxious smoke and fumes, decreasing spark plug fouling and reducing deposits.

**Circle No. 197 on Reader Inquiry Card**



# PRODUCT REVIEW

## Hydrostatic walk-behind new for mower company

Gravely International has introduced its first hydrostatic walk-behind front-



mount mower, the Hydro Pro.

The new unit is powered by a 16-hp twin-cylinder Vanguard engine and features individual Sundstrand 70-series hydrostatic pumps to each wheel, individual wheel motors driving each wheel and single lever (friction washer) control for maximum forward ground speed control.

With approximate ground speeds of 0- to 5.4-mph forward and 0- to 1.5-mph reverse, the new Gravely unit mows as quickly as it will smoothly, according to Gravely. The unit can be used with all mower decks currently available for the Gravely Pro Series Heavy Duty machines, 40-, 50-, and 60-inches.

**Circle No. 198 on Reader Inquiry Card**

## Powerful gasoline blower keeps greens dry, cool

Tempest Technology Corporation, the largest manufacturer of power blowers in the fire service industry, has announced the introduction of a new gasoline blower for use in the golf market.

Tempest says the blower is the most powerful blower on the market, and that it produces huge volumes of air that quickly dries a wet green.

The company says that the blower lets a greenskeeper control the amount of air needed for each problem green.

Because the blower is portable, it can be moved from one problem green to another, or to various areas around the green. Available in 5- and 9-hp units.

**Circle No. 199 on Reader Inquiry Card**

## Hose reels have many spray and washdown uses

Hannay Reels makes a hose reel that is ideal for a number of pest control, landscape management and pressure washing procedures.

The Series 1500 handles 1/4"-1/2" i.d. hose and comes equipped with either a direct-crank rewind or a chain and sprocket drive powered by electric or compressed air motor. An auxiliary crank is available on the power rewind model as well.

Hannay Reels makes hose and cable reels for virtually any purpose, and the use of a reel extends the life of costly hose and cable, and keeps it safely stored and ready for use.

**Circle No. 200 on Reader Inquiry Card**

## Backhoe attachment tackles the tough digging projects

Toyota's Skid-Steer Loader backhoe attachment is designed to tackle many



tough digging tasks, especially in tight places.

With a maximum digging depth of approximately 11 feet, the unit is suited for digging footings, foundations, general excavation, water and sewer line trenches, swimming pools and other applications where larger machines or hand labor are not practical.

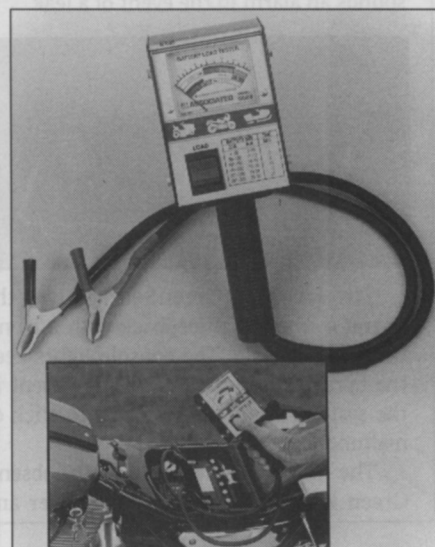
Buckets range from 10" to 36". The skid steer is designed to provide big machine performance in a compact, economical package, according to Toyota.

Easy-to-use lever controls and an adjustable boom swing speed control help keep learning time to a minimum. Hydraulic pump is standard equipment.

**Circle No. 201 on Reader Inquiry Card**

## Battery tester available for smaller engines

An easy-to-use, hand-held battery tester for small engines is now available from



Associated Equipment Corporation.

The Model 6028 diagnoses charging and starting problems on 6- and 12-volt systems. With a single hook-up, four tests can be read on the simplified "good-bad" meter: state of charge; full load battery output; charging system voltage output; starter draw.

**Circle No. 202 on Reader Inquiry Card**

## Turf sweeper single reel design is high efficiency

The Smithco Sweep Star turf sweeper utilizes a single reel design which operates with high pick-up efficiency and requires little maintenance.

Its full-floating, 5-foot wide reel, with pliable, serrated rubber fingers, removes leaves, clippings, pine needles and the smallest trash without damage to the turf, according to Smithco.

The sweeper is built with a hydraulic control system completely separate from its drive-train, which lets the sweeper raise and dumps at any height up to six feet.

The hopper lifts easily to trucks, containers, and compost piles, even with wet and heavy loads. The sweeper is powered by a Kohler 23-hp, 4-cycle engine. A Kubota 19.5-hp diesel is optional.

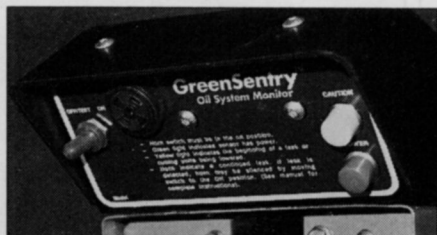
**Circle No. 203 on Reader Inquiry Card**



# PRODUCT REVIEW

## Oil monitor detects hydraulic fluid leaks

Jacobsen's new GreenSentry monitors the flow of oil in the hydraulic system, and sounds an alarm in the event of a leak.



The Jacobsen GreenSentry gives the operator important feedback with a front-mounted console. The console lights keep the operator informed of oil movement in the system. There are no floats to stick or malfunction.

The monitor is available for Jacobsen's Green King IV triplex greens mower and

the LF-10 fairway mower.  
**Circle No. 204 on Reader Inquiry Card**

## Insecticides receive federal OK for mole cricket control

DowElanco's new Pageant DF insecticide has received federal EPA registration to control mole crickets in turfgrasses.

The label for the company's Dursban 50WSP insecticide has been expanded to mole cricket control in turf.

"Pageant DF and Dursban 50WSP, when used in an integrated pest management program, provide an effective way to control mole crickets, which have now become the most destructive insect pest of turf in the Southeast," says Mike Shaw, DowElanco spokesperson.

Pageant DF is a dry flowable broad-spectrum insecticide; Dursban 50WSP is a wettable powder in water soluble packets.

**Circle No. 205 on Reader Inquiry Card**

## Pelletized minerals ready for green industry use

Kelly Lime & Rock Co., Inc. now distributes pelletized limestone, dolomite and gypsum in 50-lb. poly bags.

According to Kelly, the products are 100 percent natural. Fast-acting High Calcium Limestone is non-burning, cor-



rects soil acidity, provides plants with nutrients and helps decay lawn clippings.

**Circle No. 206 on Reader Inquiry Card**

## POLLUTION CLEAN-UP INSURANCE FOR COMMERCIAL LAWN CARE FLEETS AND EQUIPMENT

*Through the National Lawn Care Risk Purchasing Group, Inc., Lawn Care firms can now purchase pollution clean-up insurance for spills which are the result of an automobile accident.*

*Reasonably priced clean-up insurance is available for all sizes of trucks and production equipment providing up to \$100,000. in annual clean-up costs.*

*Coverage is provided by Lloyd's of London and is subject to a \$2,500. deductible per accident. This program will not replace your automobile insurance—it will fill a void in your current policy. Consult your Agent or Broker to verify that your current policy does not provide pollution clean-up protection.*

*For further details contact:*

**Richard P. Bersnak, Jeanne Bartkus, or Dan Remley at:**

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Circle No. 147 on Reader Inquiry Card



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Because of a heightened sense of concern about our environment

It's in these areas you should use Exhibit.™

While harmless

the nematodes in Exhibit are driven to seek out these harmful pest larvae. They infect the pest with a deadly bacteria, feed on the remains, then reproduce.

The offspring continue to hunt down pest larvae. Once successfully eliminated, the nematodes simply

die off. So what you're left with is healthier turf. Not to mention peace of mind.

To learn more about our natural larvicide, just call your

these days, you're probably leery of using certain pest control products near water or wooded areas.

to wildlife and beneficial insects that thrive on your course, the beneficial nematodes in Exhibit are quite deadly to the cutworms, billbugs, and sod webworms that destroy it.

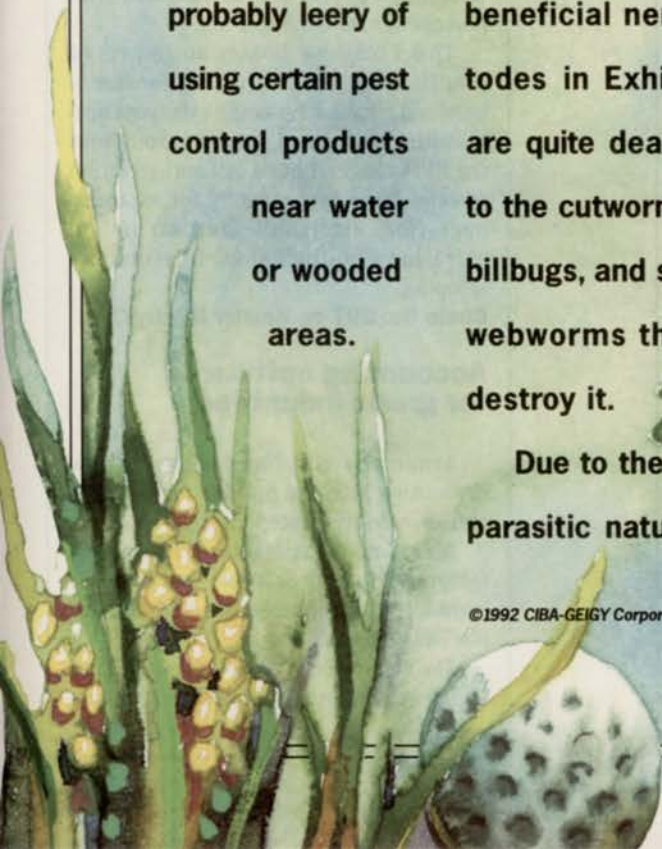
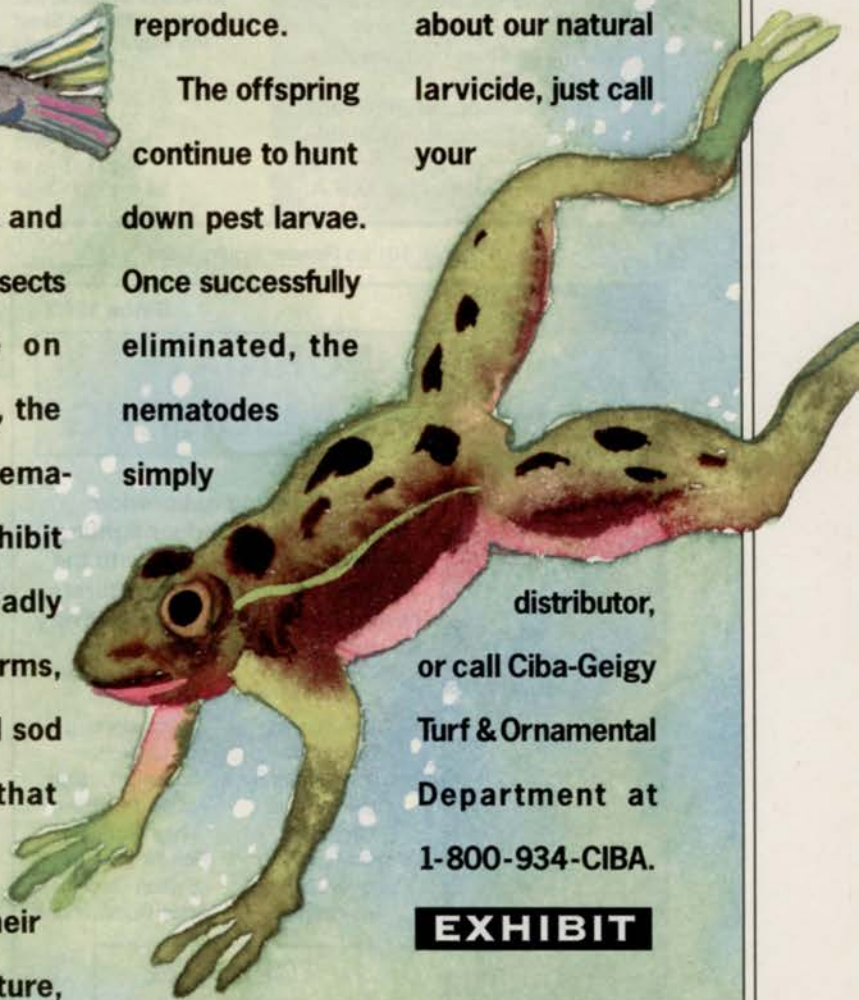
Due to their parasitic nature,

distributor, or call Ciba-Geigy Turf & Ornamental Department at 1-800-934-CIBA.

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Circle No. 108 on Reader Inquiry Card

## PRODUCT REVIEW

### This trimmer is heavy-duty, high-torque workhorse

The T-27 is Shindaiwa's premier,  
heavy duty workhorse. It's noted for out-



standing power, high torque and light  
weight. The T-27 has electronic ignition  
and a TK professional quality slide valve  
carburetor for precision fuel metering in  
the mid-RPM ranges where a trimmer  
often runs.

Shindaiwa's T-27 features an efficient  
forced air cooling system, automatic cen-  
trifugal clutch and a full anti-vibration  
system. The Shindaiwa line of trimmers  
offers one lightweight flexible-shaft model  
and four straight-shaft models weighing  
from 8.6 lbs. to 12.3 lbs., with  
horsepower from 0.8 to 1.5.

The T-25 now boasts an improved  
throttle, moved under the shaft for ease of  
handling. It's 1.4 hp engine delivers out-  
standing power and torque throughout  
the RPM range. It has a full anti-vibration  
system, large fuel capacity for extended  
operation, electronic ignition and an  
extra-long 60-inch shaft to eliminate  
stooping.

Circle No. 207 on Reader Inquiry Card

### Accounting software for green industries

Armor Systems has designed a new  
accounting software package for the agri-  
culture/nursery-related market.

According to its Maitland, Fla. manu-  
facturer, Premier Software can increase  
productivity, reduce costs and control  
business activities.

The software can track inventory, sales  
and purchase orders. It also relays cus-





## THE EARLY BIRD CATCHES THE SAVINGS



# DURING LESCO'S SPRING EARLY ORDER RENOVATION PROGRAM.

Now is the best time to order LESCO renovation equipment. We've got special Early Order Pricing on our Renovator-20, Aerator-30 and Dethatcher. Order between May 15th and July 1st and save hundreds of dollars. **And no payment is due until October 1st with**

### **approved credit !**

Engineered and manufactured by LESCO, the Renovator-20 features a new upper handle design and heavy-duty cables, making it more productive and operator - friendly. Our Aerator-30 and Dethatcher continue to offer turf maintenance professionals season

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EOP Price: \$2,690 Save \$260

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EOP Price: \$1,040 Save \$100

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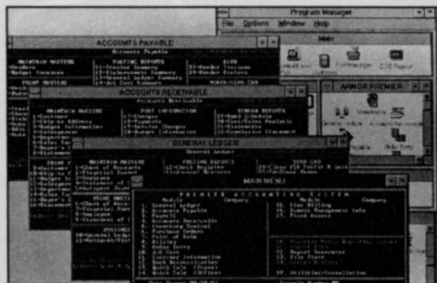
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# PRODUCT REVIEW



tomor information, and a Purchase Order program tracks demand. The Point of Sale program allows customers to pay with cash, check or five different credit cards.

Other modules are order entry, billing, general ledger, accounts payable and accounts receivable.

**Circle No. 208 on Reader Inquiry Card**

## Treatment system cuts nitrates by 80 percent

An 80 percent reduction in contaminating nitrates was achieved at a Pennsylvania school system, after installing an alternative wastewater treatment system manufactured by Cromaglass Corp. of Williamsport, Pa.

Three studies, one conducted by Dr. Melvin C. Zimmerman of Lycoming College at a 250-student school that generates 1400-2200 gallons of wastewater per day, proved the Cromaglass system's efficiency.

The treatment system is also in use at the Jack Nicklaus-designed Grand Cayman Island golf course, and various island banks, condominiums and office buildings.

According to Cromaglass, the collated

data has demonstrated the batch treat unit capable of excellent total nitrogen removal superior to that required under new federal and state agency regulations.

**Circle No. 209 on Reader Inquiry Card**

## New hydrostatic ZTR cuts a 42-inch path, maneuvers

Dixon Industries now offers the green industry a 42-inch hydrostatic ZTR mower.

The new ZXTR 542 features Hydro Gear drive, and, according to Dixon, outmaneuvers any heavy duty mower on the market.

The mowers move in tight circles around trees or light poles, cut neat, square corners without leaving uncut patches, turn in place without interrupt-



ing the pace. On lawns with numerous trees, benches and other obstacles, those saved minutes become hours.

It is powered by a Kohler engine.

**Circle No. 210 on Reader Inquiry Card**

## New mulching blade has eight cutting edges

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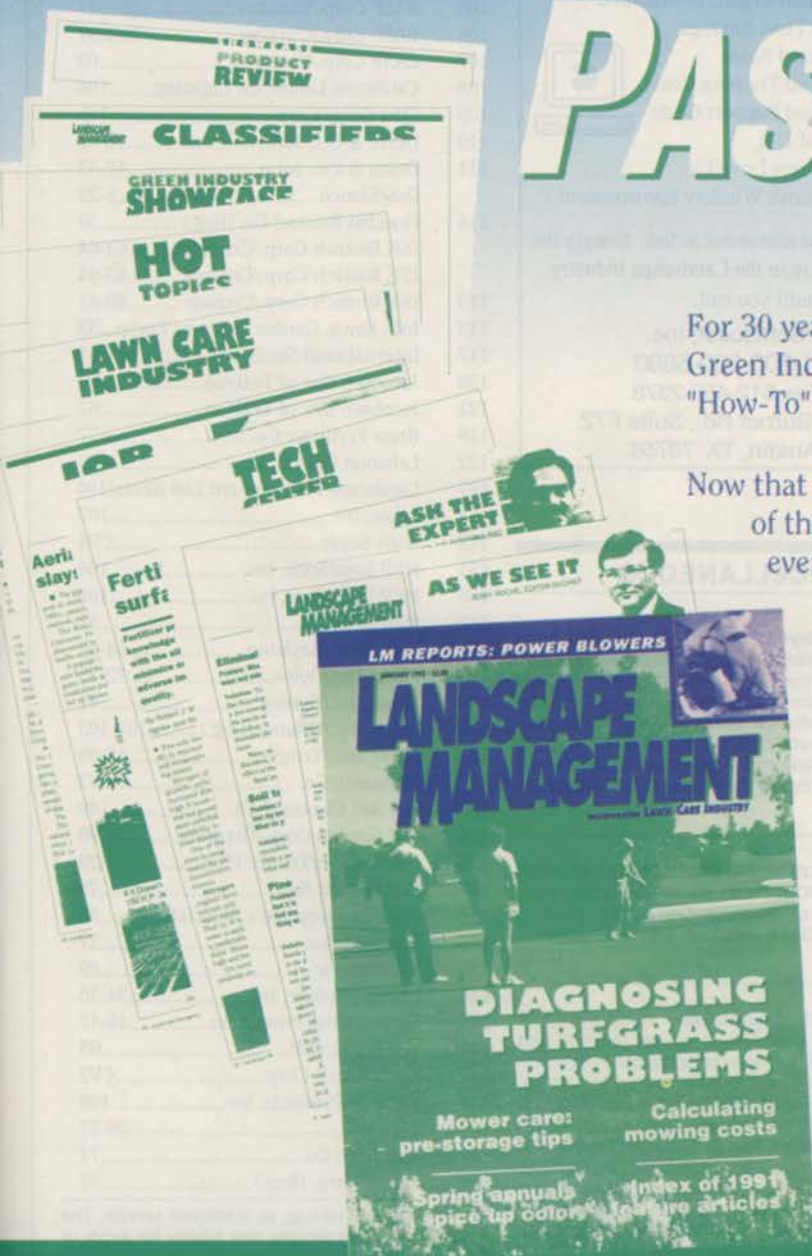
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