"PennLinks survives 126° heat and below freezing temperatures here in the desert"

"Here at The Vintage Club, we pride ourselves on our 36 flawless Penncross greens, so when Dr. Joe Duich at Penn State University asked me to test his experimental bentgrass PSU 126, now PennLinks, I jumped at the chance. After two years of extreme desert temperatures, this chipping green looks absolutely perfect, and I get raves from the membership.

I have found that PennLinks has a more upright growth habit and more uniform color than Penncross and that fast, true putts are the standard.

While I'm not given to praising products loosely, here I am plugging PennLinks ... and what better place than on our perfect pitching green!"

DJ Pakkala, Supt.
The Vintage Club
Indian Wells, CA

PennLinks PVP 8700030

Warren Bidwell is available to speak to your superintendents' group about the Penn bentgrasses. Call our toll free number for details.

TEE-2-GREEN Corp., PO Box 250 Hubbard, OR 97032 1-800-547-0255 FAX 503/981-5626 TWX 510-590-0957
When good shots end up in bad lies on dollar spotted fairways, it can spot your course’s reputation. That’s good reason to put Rubigan* in play. Dollar for dollar, nothing controls dollar spot better.

Just one Rubigan application controls even resistant strains of dollar spot for up to 28 days. And one case of Rubigan will treat up to 8 acres of greens and fairways.

Rubigan® is the only fungicide labeled to treat and prevent all these other turf spoilers, too: Fusarium leaf spot, necrotic ring spot, summer patch, take-all patch and spring dead spot—plus large brown patch with a Daconil 2787* tank mix.

Keep your fairways, tees and greens dollar spotless—looking clean and beautiful all season long. Get Rubigan from your Elanco distributor. Or call toll-free: 1-800-352-6776.

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Rubigan® — (fenarimol, Elanco)
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From sweet spot

...to dollar spot (!?/:-%!)
There's an armed struggle going on out there. Man versus machine. In this case, it's operators just like you battling it out with old-fashioned "pistol grip" type steering. But now there's a way for you to gain the upper hand. T-bar steering exclusively from Toro. Toro's patented T-bar steering system makes commercial walk behind mowers easier than ever to operate. So much so that users prefer it 8 to 1 over pistol grips.

The first area of superiority is manpower. All that squeezing and wrestling with pistol grips can fatigue even the heartiest operator. But with the T-bar, you simply push forward on the bar itself for easy, controlled mowing. That minimizes fatigue and keeps operators going longer.

T-bar steering also improves maneuverability. Now
In Arms Control.

you can get around any obstacle easier, faster and cleaner. Just move either end of the bar forward or backward and the machine changes direction.

T-bar steering offers you more control, too. That's because the T-bar handle itself is your traction control. Let go, and the handle returns to neutral and disengages the traction belts.

The next time you see a Toro T-bar walk behind mower, stop and ask the operator how it performs. We expect you'll want to contact your local Toro distributor for a thorough demonstration. At which time you'll see firsthand just how important arms control is to your future.

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76 It's a Jungle Out There
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82 How Fast Is Too Fast?
Yes, you can grow too fast. As a matter of fact, you might be growing too fast right now. Here are some questions you can answer to tell you exactly how fast you're growing. If it's not, the company stands to lose money.
Nissan kills roaches, fleas and ticks.

When you're in the business of eliminating pests, the last thing you need is to have one in your fleet.

That's why the Stanley Pest Control Company counts on Nissan® Hardbody™ trucks. With Hardbodies, bothersome breakdowns and annoying, unscheduled service are as rare as bugs after a visit from Stanley's.

And fortunately, Hardbodies are just as useful as they are reliable. With big, seamless double-wall cargo beds. Roomy interiors. And easy-in, easy-out aircraft-style doors.

So whether you're looking for a 4x4, two-wheel drive, King Cab® or Long Bed, call 1-800-323-5313 for the Nissan Regional Fleet Manager nearest you.

When it comes to fleets, we've worked out all the bugs.

NISSAN
Built for the Human Race.
More students on the horizon

Jules Janick, Ph.D., predicts that current low horticultural enrollments at universities will swing around in less than a decade.

Janick, outgoing president of the American Society of Horticultural Science, notes that figures also show that consumers are willing to pay more for landscape horticulture, and predicts that trend will continue.

"I'm optimistic but cautious," Janick told the A.S.H.S. membership at its annual meeting. "The success of Floridians to create a horticultural paradise over sand and alligators has been an inspiration to all of us. Whatever the future brings, I guarantee excitement."

A one-handed killer

Latest concern of the National Arborist Association is the one-handed use of small chain saws while pruning or trimming trees. "If ever there was the opportunity for a serious injury, this is it," says N.A.A. executive secretary Bob Felix.

"Accidents don't happen, they are caused," Felix told attendees at the ALCA/PGMS Green Team show. "No matter what you are doing, you can have unsafe situations. For moral and practical reasons, every employer has an obligation to make every employee work safer. You can't use safety training programs enough."

Felix also revealed that the American National Standards Association has written new standards and safety practices, which will be released soon, and that employers should make every effort to follow them.

Possible new bio-control

A newly-discovered parasite might be used to control grub populations in the future, leading to less pesticide use on turf and crops.

According to a report from the Connecticut Experiment Station Newsletter provided by LM advisor Marty Petrovic, the parasite's name is Ovavesicula popilliae. A spore is secreted by O. popilliae that is harmful to Japanese beetle grubs.

"Since it apparently attacks only Japanese beetles, it may have arrived here with the beetles about 1910," said the newsletter. "We are now determining if we can use it to help control Japanese beetles, and thereby reduce the amount of pesticide applied to the soil."
"One of my employees ran the mower into the lake. My wife totalled our new Volvo. And my daughter just dyed her hair purple. But what really concerns me is Pythium."

There's one sure way to avoid worrying about Pythium. Use Subdue® fungicide. Subdue stops Pythium on contact. And once absorbed by grass roots, Subdue protects your turf against further attack for up to three weeks. So don't let Pythium get you down. Get Subdue. Because you've got other things to worry about. CIBA-GEIGY

©1987 CIBA-GEIGY Corporation, Ag Division, Box 18300, Greensboro, NC 27419 Always read and follow label directions.
Two new products for control of the dangerous fire ant hit the market last summer, Logic fire ant bait from PBI/Gordon and Affirm fire ant bait from Merck.

Fire ants, named for the burning sensation of their stings, are a growing problem across the southern part of the United States. They are potentially fatal to about one percent of the population. Invaders from Brazil, fire ants have spread over 270 million acres since their first appearance 50 years ago in Mobile, Ala.

Logic’s active ingredient is fenoxy-carb, an insect growth regulator. Test results show that newly-hatched winged female fire ants are completely sterile because of the effects of Logic, a granular bait. These young queens are the ants that could potentially mate and start new colonies. Logic also stops the development of the fire ant brood, preventing young larvae from becoming adult worker ants.

Logic is available to landscape managers through PBI/Gordon, Kansas City, Mo. (phone 816-421-4070).

Affirm is a bait derived from a natural soil microorganism. When worker ants feed it to fire ant queens, Affirm stops them from laying eggs. It is also toxic to the workers. Active ingredient is abamectin.

Affirm is marketed more toward the homeowner market, though it is available to the landscape manager through the Rigo Company, Buckner, Ky. (502-222-1456) and Security Lawn & Garden Products, Ft. Valley, Ga. (912-825-5511).

"The product received kind of a late start last year," says George Gosen, director of agricultural products for MSD Agvet, a division of Merck. "We expect a lot more use of the compound in 1988 and beyond."

ASSOCIATIONS

Ciba-Geigy donates $50,000 to GCSAA

A $50,000 contribution to the Golf Course Superintendents Association of America has been received from Ciba-Geigy. The Robert Trent Jones Sr. Endowment Fund, established by the GCSAA last August, makes scholarships available to outstanding students in collegiate turfgrass management programs across the country. The fund encourages future leaders among golf course superintendents.

"We’re pleased and excited about the opportunity to make a significant contribution to the endowment fund," says Bill Liles, director of Ciba-Geigy’s Turf and Ornamental Department. "Furthering turf research through scholarships is an excellent example of industry, education and the GCSAA working together."

INSECTS

Insects become opportunists when attacking plants, trees

Weak, improperly-cared-for trees and other plants are the most likely targets of insect infestations, says Dave Nielsen, Ph.D. at Ohio State University’s Agricultural Research and Development Center in Wooster.

Nielsen told landscape managers at the Pro Show in Dallas that getting rid of these pests could be a problem, but not just because of resilient bugs.

He cited concerns about liabilities associated with using pesticides in landscape management, the availability and cost of liability insurance, and government restrictions on chemical use in the marketplace.

Much of this can be avoided, he says, by properly caring for the tree from the beginning, "contributing to natural resistance."

Important among the contributors are site quality, superior planting stock and systemic tree health care. "Work with architects for proper planting sites," he suggests.

To match a tree to a site, he makes these considerations: exposure, drainage, traffic, fruiting, form, space and soil type.

Adequate supplies of clean air, moisture and sunlight above ground, and water, oxygen and nutrients below ground are essential. He suggests aerifying to a depth of 16 to 18 inches to keep a sufficient oxygen supply near the roots.

"The most important part of tree health care is the client," he adds.

Neilson
Work closely with the client to gain an understanding of the tree’s needs. He also believes in charging for a tree survey or inventory (this is a business, after all).

Trees and their caretakers have to deal with a myriad of insects. Nielsen says a healthy plant will go a long way toward reducing the need for major tree repair and pesticide applications: quality plants, not pest control.

ATHLETIC TURF

**Artificial turf injuries appear to be on the rise**

Artificial turf is hurting athletes, say an overwhelming number of college athletic directors. The athletic directors, from schools in the National Collegiate Athletic Association (NCAA), cited increased injuries to knees, ankles and elbows as the main reason they preferred natural fields.

Of the 177 who responded, almost 68 percent opposed synthetic surfaces. That included some Division IA schools which currently have artificial fields. Only 23 percent support artificial turf, while the others are undecided.

BASF Corporation Fibers Division sponsored the survey. Respondents averaged more than 21 years experience in coaching and athletic administration.

More than half of the respondents, 53.1 percent, see a trend back to natural fields.

Comments from respondents characterized artificial surfaces as “too hard,” “abrasive,” with no give. Besides knee, ankle and elbow injuries, burns and contusions also topped the list.

An athletic director at a Division 1AA school in Illinois agrees “totally with our players and coaches that the injury situation is considerably worse when we play on artificial turf. If the players and coaches have their way, we will soon have all natural fields again.”

Several coaches, however, favored synthetic turf. One service academy official said, “The main problem is footwear, not the turf.” A Division III administrator said, “Our players learned to fall and run appropriately on the artificial surface.”

Despite the controversy, some schools take a pragmatic approach to the matter. “Our coaches want to practice on natural grass,” one administrator reported, “but play games on artificial.”

For more information on athletic field safety and care, reprints of “Sidelined” and “Hard Knocks” from continued on page 12

**SHORT CUTS**

**WELL-READ...**Maria Cinque, horticultural extension agent for Long Island, N.Y., is becoming somewhat famous along the eastern seaboard. Cinque, since last April, has been writing a weekly column in the Sunday editions of Newsday. She also writes for the New York editions of the same newspaper. The papers have a combined circulation of more than one million readers. “These columns give the general public a constant in horticultural information,” Cinque says.

**IMPRESSIVE PRESS...**Robert Dedman of the Club Corp. of America recently received national attention, along with William Kubley of Landscapes Unlimited. Dedman, who founded Club Corp., was written up in the Dec. 14th issue of Forbes magazine. “Even before it turns profitable, a Dedman club can be a cash machine,” Forbes said. Kubly, owner of Landscapes Unlimited of Lincoln, Neb., received a write-up in Inc. magazine for being the 441st fastest-growing entrepreneur in the country. Minors Lawn Care of Fort Worth, Tex. was No. 446 and Suburban Landscape of Davenport, Ia. was No. 447 on Inc.’s list of the top 500.

**A WORLD RECORD...**Briggs & Stratton, the world’s leading manufacturer of small gasoline engines, has made the Guinness Book of World Records. The first product ever produced by the company from 1920 to 1923, a buckboard-like car called the Flyer, was named the most inexpensive mass-produced road car in history. The nationally-syndicated television show “Guinness Book of World Records,” which was scheduled to air in mid-January, was to highlight the car. The Flyer sold for $145 to $225, according to George Thompson III of Briggs & Stratton. Only about 2,000 of the Flyers were manufactured, though.

**RESTLESS NATIVES...**ANVIL (Association for the use of Native Vegetation in Landscapes) received time on the Voice of America. Roger Lemke of LaFayette Home Nursery near Chicago invited a reporter to see the prairie growing in his yard. “I had to be careful,” Lemke says. “I had to make sure I referred to aggressive weeds instead of Eurasian weeds.”

**GETTING INTO CONDITION...**Seed companies no longer clean turfseed. But that doesn’t mean you’ll see a lot of weeds in the next lawn you seed. To get around (or, is it cooperate with?) the EPA, seed companies now refer to seed cleaning as conditioning. But, says Jerry Pepin, Ph.D., of Pickseed West, the seed still meets quality standards.

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Keep your fairways looking great.
Golfers love to play on beautiful fairways. It's that simple. Which is why it's so important to keep your course in top shape. That means controlling diseases like dollar spot and anthracnose. And that means a program using BAYLETON fungicide.

BAYLETON is taking care of more and more beautiful fairways because more superintendents are discovering how long it lasts. How much they save in application costs by making fewer applications. And how good it makes them and their fairways look.

BAYLETON. Because golfers play favorites. Specialty Products Group, Box 4913, Kansas City, MO 64120.

Bayleton is a Reg. TM of Bayer AG, Germany.
Lebanon’s premium fertilizers with Team™ pre-emergence herbicide let you double-team your turf’s toughest competition: annual bluegrass, smooth and hairy crabgrass, goosegrass, and green and yellow foxtail—as they germinate.

Lebanon’s fertilizer/control products featuring Team have the added strength of two of the most effective defense-oriented pre-emergent herbicides today—benefin and trifluralin. And, the potent offensive power that Lebanon’s premium fertilizers bring to strengthen northern and southern turfgrasses.

It’s double trouble that lasts. Team won’t leach out, even in heavy rainfall. Once it’s activated, it forms a vapor zone to keep weeds from sprouting for several months.

For more information on which Team formulation is right for your turf conditions or on custom-blended options, call our Greenline today at 1-800-233-0628; in PA, at 1-800-852-5296 or 717-273-1687.

For a winning season against annual weeds, put our Team products to work for you.

There’s a Lebanon fertilizer with Team formulation to meet every lawn care need.

- Lebanon Pro 20-3-5 (4 SCU) with Team™ 1.155%
- Lebanon Pro 15-5-5 (4.5 SCU) with Team™ 1.155%
- Lebanon Pro 15-3-3 (All Chemical) with Team™ 1.155%
- Lebanon Pro 30-5-7 (7.5 SCU) with Team™ 1.54%
- Lebanon Pro 26-3-8 (5 SCU) with Team™ 1.54%
- Country Club 19-4-6 (3.2 WIN) with Team™ 1.155%

PESTICIDES

Australian brings U.S. a new word

Peter R. Meadows, in an address to the National Pest Control Association, coined a new word. The word? “Toxo-terrorist.”

The word, Meadows says, is derived from book “Toxic Terror” by Dr. Elizabeth Whelan. Whelan was a keynoter at the 1986 Professional Lawn Care Association’s conference.

Meadows is group technical sales manager for W.A. Flick & Co. and vice-president of the Council of Australian Pest Control Association.

“We have decided (in Australia) that it is time that we attacked,” Meadows said. “As long as we allow the public to judge us on the strength of debate between ‘environmentalists’ and ‘pest exterminators,’ we have lost every debate before we start.

“But if we change the debate to one between ‘toxo-terrorists’ and ‘environmental managers,’ what a different picture that can create in the minds of listeners!”

Meadows said that the toxic terrorists do not know how to defend themselves.

“Senior government officers, who in the past have been very careful in what they say about these people, are now finding that ‘toxo-terrorism’ has a nice way of rolling off their tongues and they are using it with increasing frequency.”

Meadows concluded by issuing a challenge to his fellow pesticide applicators in America:

“Ladies and gentlemen, we bring you this word to add to your language. We dare you to use it. Leave the black magic to the toxo-terrorists. They will, with our help, eventually become entangled in their own web of deceit.”

BUSINESS

Foiling lawsuits with a few tricks

Landscape, lawn care and tree companies should incorporate every truck individually, says attorney Richard Jack of Athens, Ga. Jack says that such a tactic will protect the company from paralyzing lawsuits.

“Most large cab companies incorporate cabs individually,” Jack says. That way, Jack explains, a person can sue for only the worth of the truck that committed the wrong, not the entire corporation. “If you have a major liability source, cut it away from your corporation,” Jack says. “Take your assets out of the corporation. Never travel under your own hat. Always travel under the corporation’s hat.”

In order to meet all the rules of a corporation, Jack says you must remember to file an annual report and have a meeting with the board of directors. “That means you have to meet with yourself,” he says.

Another way to guard against lawsuits is to not modify equipment on your own. “If you go out and build equipment, you’re the manufacturer,” Jack warns. “If you’re a dealer, get the manufacturer to do it.”

Also, make sure equipment isn’t worn. “Worn equipment will get you into trouble because you know better,” Jack says. “Even by attending trade shows, you’re held to a higher standard.”

Jack spoke at the Pro Show in Dallas, Texas.
WHEN IT DOESN'T COME WITH A HONDA, YOU CAN KEEP IT GOING WITH ONE.

And the reasons to keep it going with a Honda are as plentiful as they are persuasive.

For starters, our line of Overhead Valve engines use substantially less fuel and oil than comparable side valve engines. And they're especially easy starting, thanks to Automatic Decompression and a maintenance-free electronic ignition.

Almost all of our engines feature Honda's Oil Alert, which automatically shuts off the engine before the oil drops below a safe operating level.

And we have replacement engines for all kinds of equipment. Our line includes horizontal and vertical shaft models from 2.2 to 13.0 horsepower.

All of which should persuade you there's not only reason to keep your used equipment running, there's a way to keep it running better than new.

IT'S A HONDA Equipment Engines
What The Average Person Considers An Eyesore On The Golf Course.

Just the sight of Poa annua makes us cringe. And it seems to never go away.

So after putting our ears to the ground and our best minds in the lab we discovered a beautiful solution. Our remarkable new TGR™ Poa Annua Control.

Scotts patented TGR technology weakens Poa annua on fairways and bentgrass greens, while controlled-release fertilizer helps desirable turf thrive and overtake the Poa.

But most important, the transition to desirable grasses is gradual. So there's not a
What A Scotts Tech Rep Considers An Eyesore On The Golf Course.

sudden change in playing surface conditions.  
Ask your Scotts Tech Rep to help you incorporate TGR Poa Annua Control in your turf management program.

At least you’ll have one less ugly problem to worry about.  
For more information contact your Scotts Tech Rep or simply call 1-800-543-0006. In Ohio call collect 513-644-2900.
1988-89 seed crop looks on bleak side

The extended drought in the Pacific Northwest last fall may have damaged the seed crop. "The groundwork for 1988 has already been laid and it doesn't look very good," says Jerry Pepin, Ph.D., of Pickseed West.

The Kentucky bluegrass crop, however, will be slightly improved, according to Pepin. "A year ago crops were terrible. This year they will be tight," he says. "The crop should be healthy, but the demand is unprecedented. Prices will be high, and better varieties will be limited."

The bentgrass crop may be slightly improved, but demand will keep prices high. "There's a lot more use on fairways in the North," Pepin says. "And it's being used for overseeding in the South."

Pepin estimates fine fescue supplies to be adequate, despite a decrease in growing acres. "For low-maintenance or shade tolerance, fine fescues can't be beat," he says. "Prices will be firm."

Supplies of perennial ryegrass and turf-type tall fescue will be short. "Use of perennial ryegrass is higher than it's ever been," Pepin says. Despite the fact that seed companies produce more than 50 million pounds annually, increased use on fairways and home lawns will keep supply low and prices high.

Tall fescues are in demand because of their drought tolerance. "The dwarf-type varieties will be the wave of the future," Pepin says. Pepin recommended buying seed early in the spring, especially if you want a specific variety. He spoke at the North Central Turfgrass Conference in St. Charles, Ill.

Ohio State's Buscher retires to Wooster

Fred K. Buscher has retired from The Ohio State University's horticulture department, effective last summer.

Buscher, Ph.D., retired as Professor of Horticulture Emeritus. As a district specialist in landscape horticulture, he had developed and conducted a series of five landscape design short courses, the Northeast Ohio Horticultural Trade Shows and the Nursery Field Days. Buscher will remain active in the nursery industry and reside in Wooster, Ohio.
BUILD YOUR PYTHIUM CONTROL PROGRAM ON A FIRM FOUNDATION.
CHIPCO® ALIETTE.

Only CHIPCO ALIETTE fungicide translocates throughout your turfgrass for total Pythium protection.

If you're like many golf course superintendents, you rotate fungicides to reduce the risk of disease resistance. But you still need a "foundation" product you can count on for effective, long-lasting Pythium control. And the name of that product is CHIPCO ALIETTE fungicide.

Unlike other turf fungicides, CHIPCO ALIETTE fungicide features a unique two-way systemic action. Once applied to turf, its active ingredient translocates downward and upward throughout each grass plant. The result: total disease protection from top to bottom.

In addition, CHIPCO ALIETTE fungicide offers you 21 days of Pythium protection from a single application. Even in hot, humid weather, CHIPCO ALIETTE fungicide stops Pythium before it gets started.

Best of all, CHIPCO ALIETTE fungicide delivers long-lasting pythium prevention at a down-to-earth price. In fact, CHIPCO ALIETTE fungicide is one of your best fungicide values based on cost per day of control.

This year, discover the fungicide that's in a class by itself. CHIPCO ALIETTE fungicide.

Rhöne-Poulenc Ag Company, CHIPCO Department, P.O. Box 1204, Research Triangle Park, NC 27709.
We improved these fairways by putting 11½ of our best feet forward

Your first impression is correct. The John Deere 3325 Professional Turf Mower is different from others you've seen. It's accessible, precise, lightweight. Designed to deliver what others don't.

Start with single lever reel lift. Here, one lever is all it takes to simultaneously raise all five cutting units. A big benefit when cross-cutting.

The five, quick-release cutting units combine to mow 11½ feet on every pass. And, the 38 net hp 3325 walks softly with a ground pressure of only 9.7 psi with the units down.

Frame design allows the center cutting unit to carry a full-size grass catcher. Another John Deere exclusive that saves you time, makes your operation more efficient.

As you mow, features like power steering, differential lock, 12-function systems monitor, cruise control, and a 20-gallon fuel tank help make you more productive.

Service is also a snap. Here, a hinged fuel tank and engine cowling give unequaled access to the entire drivetrain.

All told, the 3325 is an entire collection of advantages you won't find on other machines. Advantages that make you more productive, your course better kept.

Talk to your distributor today for a look at this impressive new mower. Or write John Deere, Dept. 956, Moline, IL 61265 for free literature. We know you're going to like what you see.

Floating cutting units and mounting arms deliver ground-hugging performance over contoured terrain.
GREEN AND GROWING

The third annual Landscape Management survey of the Top 50 money-making landscape contractors in the United States is growing along with the landscape industry.

By Jeff Sobul, assistant editor

Although the landscape industry grew in volume in 1987, so, too, has Landscape Management's list of the Top 50 money-makers for that year.

The 50th largest company on the 1988 list, which reflects 1987 revenues, had earnings of $3.5 million, compared with earnings of $2.2 for last year's No. 50 company.

Not surprisingly, Environmental Industries, Calabasas, Calif., again is the top earner, with sales of $114 million spread over its 29 branches and subsidiaries.

The Brickman Group, Jenkintown, Pa., returned to the Top 50 this year after declining to participate in the 1987 listing. The company's earnings of $35 million put it in second place on the 1988 list.

Nine of the top 10 companies earned at least $10 million. The remaining seven, in order, are Moulder Brothers, Glendale, Calif. ($20M); DeLaurentis Construction, Mamaroneck, N.Y. ($18M); Carlacio Industries, Fullerton, Calif. ($15M); Vidosh Brothers, Sterling Hts., Mich. ($14.2M); Lancaster Landscapes,
Johnson Hydro Seeding Corp.  
Rockville, MD

KT Enterprises  
Alexandria, VA

Lambert Landscaping  
Dallas, TX

Lancaster Landscapes, Inc.  
Arlington, VA

Landscaping Contractors of Illinois  
Bartlett, IL

Landscape Design & Construction  
Dallas, TX

Larchwood Construction Corp.  
Holtsville, NY

Las Colinas Landscape Services  
Irving, TX

Lied's Nursery Co.  
Sussex, WI

Meadowbrook  
Savannah, GA

Moulder Brothers  
Glendale, CA

North Haven Gardens  
Dallas, TX

Northwest Landscape Industries  
Tigard, OR

Oak Brook Landscaping  
Oak Brook, IL

Oyler Bros. Co.  
Orlando, FL

Reinhold Landscape  
Flat Rock, MI

Ruppert Landscaping  
Ashton, MD

SaBell's Inc.  
Englewood, CO

Scapes  
Marietta, GA

Alfred L. Simpson & Co.  
Atlanta, GA

Southern Tree & Landscape  
Charlotte, NC

Torre & Bruglio Landscape Contracting  
Mount Clemens, MI

Valley Landscaping  
Lodi, CA

Vidosh Brothers  
Sterling Hts., MI

Yardmaster  
Painesville, OH

Arlington, Va. ($13.8M); Davis Landscape Contractors, Harrisburg, Pa. ($12M); and The Bruce Company of Wisconsin, Middleton, Wis. ($10.7M). The No. 10 company is Oyler Brothers, Orlando, Fla. ($9M).

The following is a list and brief description of those companies giving permission to Landscape Management to use the information (branch offices are in addition to a main office):

AAA Lawn Industries. Tucker, Ga., had 150 maintenance contracts and performed 20 design/build jobs for revenues of $4.5 million in 1987. The company employs 110 peak and 50 year-round workers and maintains three branch offices.

American Landscape, Inc., Canoga Park, Calif., had revenues of $8.4 million on 130 maintenance contracts and 75 design/build jobs in 1987. With one branch office, the company has 175 peak and 150 year-round employees.

The Brickman Group, Ltd., Jenkintown, Pa., operates three branches and employs 800 peak and 300 year-round workers. The company had sales of $35 million for 1987. Figures were unavailable for the number of design/build jobs and maintenance contracts.

The Bruce Company, Middleton, Wis., grossed $10.7 million on 200 design/build jobs and 45 maintenance contracts. With one branch office, the company employs 200 peak-season and 45 year-round workers.

Cagwin & Dorward, Novato, Calif., had sales of $6.5 million on 120 design/build jobs, of which 90 were erosion control, and 250 maintenance contracts. The company employs 180 peak and 150 year-round workers and operates five branch offices.

Carlacio Landscape, Inc., Fullerton, Calif., grossed $15 million on 20 design/build jobs and 15 maintenance contracts. From three branch offices the company sends 275 peak and 200 year-round employees.

Chapel Valley Landscape Co., Woodbine, Md., grossed $8 million on 40 design/build jobs and 75 maintenance contracts. The company has 125 peak and 85 year-round employees in four branch offices.

City Gardens, Inc., Newton, Mass., grossed $5.3 million in 1987 on 200 design/build jobs and 1700 interior maintenance contracts. With its one branch office it employs 140 people year-round.

Clark-Morrell, Inc., Lithonia, Ga., grossed $6.4 million on 115 maintenance contracts and 50 design/build jobs. The company has 130 peak and 110 year-round employees.

Clarence Davids & Sons, Blue Island, Ill., grossed $3.75 million on 120 maintenance contracts. It has one branch office and employs 125 peak and 30 year-round people.

Davis Landscape Contractors, Inc., Harrisburg, Pa., grossed $12 million on 50 each of design/build jobs and maintenance contracts. With four branch offices, it has 225 peak and 150 year-round employees.

De Laurentis Construction Co., Mamaroneck, N.Y., had sales of $18 million on about 25 design/build jobs, the biggest chunk being commercial. The company employs 160 to 170 peak and 50 year-round
THE BEST OF THE REST

The following is a list of companies with revenues between $2 million and $3.2 million which returned surveys:

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Location</th>
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<tbody>
<tr>
<td>Amlings Landscape Co.</td>
<td>Hinsdale, IL</td>
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<tr>
<td>Arbor Heights Nursery</td>
<td>Webster, NY</td>
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<tr>
<td>Bland Brothers, Inc.</td>
<td>West Jordan, UT</td>
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<tr>
<td>Boyco Landscape</td>
<td>Wilson, NC</td>
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<tr>
<td>Bregenzer’s</td>
<td>Alpharetta, GA</td>
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<tr>
<td>Robert W. Childs Landscape Contractors</td>
<td>Arnold, MD</td>
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<tr>
<td>Contra Costa Landscaping</td>
<td>Martinez, CA</td>
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<tr>
<td>Control Environmental</td>
<td>Secaucus, NJ</td>
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<tr>
<td>Garden Gate Landscaping</td>
<td>Silver Springs</td>
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<tr>
<td>Greater Detroit Landscaping</td>
<td>Warren, MI</td>
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<tr>
<td>Green Carpet Landscape</td>
<td>Worcester, MA</td>
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<tr>
<td>The Greenery</td>
<td>Hilton Head, SC</td>
</tr>
<tr>
<td>Greeno, Inc.</td>
<td>Concord, MA</td>
</tr>
<tr>
<td>The Ground Crew</td>
<td>Arlington, TX</td>
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<tr>
<td>Industrial Landscape Services</td>
<td>San Jose, CA</td>
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<tr>
<td>JBK Landscape</td>
<td>Aurora, CO</td>
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<tr>
<td>Kuwawa Enterprises</td>
<td>Cudahy, WI</td>
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<tr>
<td>L&amp;L Landscape Services</td>
<td>Santa Clara, CA</td>
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<tr>
<td>Land Design Group</td>
<td>Dallas, TX</td>
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<tr>
<td>Lifescapes, Inc.</td>
<td>Canton, GA</td>
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<tr>
<td>MCDugald-Steel</td>
<td>Houston, TX</td>
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<tr>
<td>Richway Landscaping</td>
<td>Kingwood, TX</td>
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<td>Rood Landscaping</td>
<td>Jupiter, Fla.</td>
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<tr>
<td>Suburban Landscape Assoc.</td>
<td>Davenport, IA</td>
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<tr>
<td>Varsity Sodding Service</td>
<td>Swoyersville, PA</td>
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<tr>
<td>Veldkamps Inc.</td>
<td>Denver, CO</td>
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<tr>
<td>Virginia Turf Management Assoc.</td>
<td>Norfolk, VA</td>
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<tr>
<td>White Oak Landscaping</td>
<td>Kennesaw, GA</td>
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<tr>
<td>Workers</td>
<td></td>
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<tr>
<td>Designs by Lee, Stamford, Conn., used 25 commercial and 200 residential design/build jobs plus 42 maintenance contracts to gross $5.4 million. The company employs 130 peak and 30 year-round people.</td>
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<tr>
<td>Doerler Landscapes, Inc., Lawrenceville, N.J., grossed $4.1 million on 170 design/build jobs and 85 maintenance contracts. With two branch offices, it employs 100 peak and 40 year-round employees.</td>
<td></td>
</tr>
<tr>
<td>Environmental Industries, Calabasas, Calif., is the largest landscape contractor in the U.S. with sales of $114 million for 1987. The company operates three divisions with 29 branches or subsidiaries in five states. The company employs about 2,200 workers at peak and 2,000 year-round. Figures for design/build jobs and maintenance contracts were unavailable.</td>
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<tr>
<td>Gibbs Landscape Co., Atlanta, Ga., has sales of more than $6 million from its main office. The company employs 100 to 160 people to complete 1,700 design/build jobs and 600 maintenance contracts.</td>
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<tr>
<td>Greaterhouse Landscape Co., Nashville, Tenn., had sales of $3.5 million on 102 design/build jobs and 114 maintenance contracts. It operates with 85 peak and 55 year-round employees.</td>
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<tr>
<td>Greenleaves, Chamblee, Ga., grossed $7.25 million on 102 maintenance contracts and 96 design/build jobs. It has 160 peak and 90 year-round employees in two branch offices.</td>
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<tr>
<td>Ground Control Landscaping, Orlando, Fla., grossed $4.3 million on 78 maintenance contracts and 23 design/build jobs. With one branch office it employs 115 peak and 100 year-round employees.</td>
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<tr>
<td>The Ground Crew, Arlington, Tex., grossed $2.85 million on 210 maintenance contracts and 15 design/build contracts. Its 87 peak and 30 year-round employees work from two branch offices.</td>
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<tr>
<td>Edmund M. Hayden, Inc., Woodstock, Ill., had revenues of $5.5 million in 1987. The company's 75 peak and 20 year-round employees performed 30 construction jobs and had 15 to 18 maintenance contracts.</td>
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<tr>
<td>Heyser Landscaping, Norristown, Pa., had revenues of $6 million in 1987. Totals for design/build jobs and maintenance contracts were unavailable at press time. The company employs 165 peak and 65 year-round employees and operates one branch office.</td>
<td></td>
</tr>
<tr>
<td>Hillehmyer Nurseries, Lexington, Ky., has 135 peak and 100 year-round employees who also operate three garden centers. In 1987, the company finished over 400 design/build jobs and had 35 maintenance contracts for revenues of $3.5 million.</td>
<td></td>
</tr>
<tr>
<td>D.A. Hoerr &amp; Sons, Peoria, Ill., reached $5 million in sales on 300 design/build jobs and three maintenance contracts. The company has four branch offices and employs 125 peak and 75 to 80 year-round employees.</td>
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</tr>
<tr>
<td>Johnson Hydro Seeding, Rockville, Md., grossed $5.4 million on 35 design/build jobs, mostly seed establishment. The company has five branch offices and employs 85 peak and 25 year-round employees.</td>
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</tr>
<tr>
<td>KT Enterprises, Alexandria, Va., operates one branch office and employs 325 peak and 150 year-round workers. The company had sales of $6.3 million on 70 maintenance contracts serving 400 properties. Figures for design/build jobs were unavailable.</td>
<td></td>
</tr>
<tr>
<td>Lancaster Landscapes, Arlington, Va., had sales of $13.8 million on 350 maintenance contracts and five design/build contracts.</td>
<td></td>
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</tbody>
</table>
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jobs. The company operates eight branch offices with 500 peak employees and 300 year-round.

Landscape Contractors of Illinois, Bartlett, Ill., completed 150 design/build jobs and had 36 maintenance contracts en route to $8 million in sales. They were performed by 140 peak and 30 year-round employees.

Landscape Design & Construction, Dallas, Texas, had revenues of $8.2 million and 55 employees.

Las Colinas Landscape Services, Irving, Texas, used 200 maintenance contracts and 34 design/build jobs to gross $6.5 million. It employs 250 peak and 175 year-round workers.

Lied's Landscape Design & Development, Sussex, Wis., grossed $4 million on 1,500 design/build jobs and 300 maintenance contracts. With one branch office it employs 210 peak and 100 year-round people.

Meadowbrook, Savannah, Ga., had revenues of just over $4 million in 1987 on more than 100 design/build jobs and 30 maintenance contracts. The company has 120 year-round employees and peaks out at over 100.

Moulder Bros., Glendale, Calif., grossed $20 million on 25 to 30 design/build jobs. The company employs 100 peak and 30 year-round workers.

North Haven Gardens, Dallas, Texas, reports $3.6 million in sales on 800 to 1,000 design/build jobs and 75 maintenance contracts. The company has one branch office and employs 125 peak and 100 year-round people.

Oak Brook Landscape & Maintenance, Oak Brook, Ill., had 60 maintenance contracts and 42 design/build jobs for $3.7 million in sales in 1987. It has 90 peak and 20 year-round employees operating two branch offices.

Oyler Bros., Orlando, Fla., had 300 maintenance contracts and 65 design/build jobs for $9 million in sales. It has three branch offices with 300 peak and 225 year-round employees.

Ruppert Landscape Co., Ashton, Md., had $6.5 million in sales on 140 design/build jobs and 75 maintenance contracts. The company has 125 peak and 75 year-round employees with one branch office.

SaBell's, Inc., Englewood, Colo., had gross revenues of $8.5 million on 125 design/build jobs and 50 maintenance contracts in 1987. The company operates one branch office and employs 300 peak and 50 year-round workers.

Scapes, Marietta, Ga., grossed $4.5 million on about 50 design/build jobs and 25 maintenance contracts in 1987. The company has 150 peak and 60 year-round employees operating one branch office.

Alfred L. Simpson & Co., Atlanta, Ga., had 150 maintenance contracts and 30 design/build jobs for $5.0 million in sales for 1987. The company employs 120 peak and 90 year-round workers.

Southern Tree & Landscape, Charlotte, N.C., grossed $5.4 million on 225 design/build jobs and 65 maintenance contracts. The company has four branch offices with 160 peak and 120 year-round employees.

Torre & Bruglio Landscape Contractors, Mt. Clemens, Mich., had 225 design/build jobs and 135 maintenance contracts for sales of $3.5 million. With one branch office, it employs 85 peak and 20 year-round workers.

Valley Landscaping, Lodi, Calif., had sales of just over $4 million on 70 design/build jobs and 80 maintenance contracts in 1987. The company employs 150 peak and 100 year-round workers.

Vidosh Brothers, Sterling Hts., Mich., grossed just over $14.2 million on 150 design/build jobs and 75 maintenance contracts in 1987. The company operates four branch offices and employs 250 peak and 100 year-round workers.

Yardmaster, Painesville, Ohio, which employs 60 to 120 workers, did $4 million business in 1987 from 400 design/build jobs and 125 maintenance contracts.
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Since turf areas are scarce in Honolulu, Mulkern believes renovation is the key to a healthy yard.

LANDSCAPING, ALOHA STYLE

Hawaii may be a tropical paradise. But landscaping on the islands is a competitive business, in which Mulkern Landscaping has carved a niche for its customers.

by Heide Aungst, managing editor

M ost people know of Ferdinand and Imelda Marcos for one of two reasons: the hostility in the Phillipines or the thousands of shoes. Kevin Mulkern of Mulkern Landscaping in Honolulu, Hawaii knows the couple by its landscape. Or, would have, if things had gone as planned.

Mulkern's company installed the landscaping at the home the Marcos' planned to purchase in their flee to Hawaii. But neighbors didn’t want the Marcos' to move in. Because of the neighborhood pressure, the infamous couple bought a home elsewhere on the island.

Still, Mulkern and his co-owner and wife, Susan, landscape many of the homes of the rich and famous on the island of Oahu.

Their business is small, but successful, amidst the competitive atmosphere of the island. Susan estimates 1987 gross sales around $300,000. The company has seen steady growth and success since its beginning in 1975.

Back then, Kevin worked alone, when he wasn't too busy surfing, he confesses. The business started out by the North Shore, famous for its surfing. But after several years, and more than an hour commute to most accounts, he moved it into the city. "More of the money is on this side of the island," Mulkern explains. "And now I'm within 15 minutes of all my accounts."

Susan joined the business in 1978. Today, the company employs eight workers year-round, since there's never an "off-season" in Hawaii. They
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Orchids can be planted in tree crevices to help create lush landscapes.

Susan and Kevin Mulkern: landscaping paradise.

do a little bit of everything in the plant and landscape realm for the 40-plus homes under contract. Susan says the business expanded in 1987 from primarily installation/maintenance to about 50 percent design/build, 50 percent maintenance and installation. "We're finding that people are wanting a one-stop shop," she says. "It makes life a lot easier for them."

Much of the design/build includes nightscaping. Lighting is a popular landscape addition on the island, since people spend most of their time outside around their pools.

Turf is a scarce commodity on the island. Those who can afford to own property have very little turf.

Bermudagrass and zoysiagrass are the common home lawn turfs, while St. Augustinegrass grows in low-maintenance areas.

Sprigs from the mainland must be quarantined for up to two years, since turf carries the same viruses as sugar cane. Then, it's expensive to install, a flat (1.39 square feet) of zoysiagrass sells for $6 to $7; centipedegrass is $4 to $5; and Bermudagrass is about $3.25 a flat.

Mulkern uses mostly walk-behind equipment because of the small area of most lawns and narrow gates leading to yards. The rotaries include Lawn Boy, Snapper and Sensation. Reel mowers, which he uses on hybrid Bermudagrass lawns, are Pro Master and Trimmer.

The best tool, he says, is his Ryan verticutter. "Verticutting pulls out stems, rhizomes and stolens," Mulkern explains. "It's especially important in zoysia lawns which develop thatch quickly. The process includes thinning the lawn, then aerating. Next, the crew top dresses with a light coat of sand or soil, depending on the site. "For clay soils we use a heavier soil so you don't get that ice cream sandwich effect," Mulkern says. Within two weeks, at any time during the year, the lawn begins to fill in.

But Mulkern found out through one lawn renovation that it's important to have good communication with customers. One of Mulkern's clients is a wealthy real estate investor who's home overlooks the ocean and who's spotless garage holds Andy Warhol prints. The man decided to throw an important party just days
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Circle No. 118 on Reader Inquiry Card
To get a competitive edge in the market, Mulkern's employees will go all-out to maintain ocean-front homes.

after Mulkern's crew had heavily renovated the lawn.

"We used dye...green dye," Mulker reminisces. "He had tables set up on the lawn, and even received compliments on his lawn."

Almost all landscapes are irrigated in Hawaii. Mulker recommends his clients use automatic Rain Bird systems. "I haven't had a lot of success giving homeowners irrigation sched- ules," he says.

Since turf is scarce, much of the landscape maintenance is done on plant material, like flowering jac- obinia, plumeria trees or the state flower, hibiscus. In fact, Mulker de- signed his own version of the hibiscus for his company logo.

"Most people want a lush tropical look," Mulker says. To add flowers to trees, Mulker's crew will plant or- chads in tree crevices. "Trees bloom throughout the year based on how much water you give them," he says. I don't really notice a difference in seasons."

Uniformity

Despite the naturalness of the Hawaiian "tropical look," competition on the island is intense. "In the old days, I used to tell people it's a great business to get into, but there's too many now," he says.

One thing some of his competitors don't do is to require uniforms. "We
do a lot of work inside people's houses and it's awkward not to have people easily indentifiable," he explains. "It's also convenient for them to have uniforms."

Each employee has 11 sets of shirts and pants. Each week they turn in five sets to be cleaned by the uniform supplier. The supplier also does alterations. That way Mulker guarantees his employees show up in clean uniforms.

Another competitive aspect to the job is getting the projects. "Bids on a project can vary 40 to 50 percent," Mulker says. "The most frustrating part of dealing with customers is that they don't understand what you're selling or what they need. Our higher price reflects that they're getting per- sonal service."

Hawaii businesses also face laws which don't govern other states and which run up the cost of doing business. For example, it's mandatory for employers to carry medical insurance for employees. Companies are able to deduct 50 percent of the cost. The Mulkers provide 95 percent of the cost of insurance. Employees contrib- ute $5 monthly toward the medical plan.

Business insurance is getting bet- ter. "Three years ago it was 17 per- cent," Mulker says. "Now it's down to eight percent."

But the benefits outweigh the price according to Susan and Kevin. They plan to expand to the nursery side of the landscape business in the future.

One thing's for sure. They won't leave the island. Even residents know when they're in paradise. LM
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Nitrogen is the most important element in a successful fertilization program. New concepts demonstrate when it is the best time to apply nitrogen, and how much is needed.

by John R. Street, Ph.D., Ohio State University

Late-season fertilization will extend the greening period and aesthetics of turf in fall and spring.

Turfgrass growth depends on an adequate supply of all essential plant nutrients, plus many other cultural and edaphic (soil-related) factors. Research in plant nutrition has shown that at least 16 elements are essential for plant growth and development (Table 1).

Those essential elements used in greatest quantities by the plant are referred to as macronutrients: nitrogen, phosphorus and potassium. Micronutrients, seldom deficient in most soils, are needed in relatively small quantities by the plant.

Nitrogen fertilization
Nitrogen receives the most attention in turfgrass fertilization programs for several reasons.

First, nitrogen is the essential element to which turfgrass is most responsive (Table 2). A key concept in turfgrass fertilization is that nitrogen is the "growth-control element." Supplies of other elements are maintained at adequate levels (maintenance fertilization). The turfgrass manager regulates growth and color by adding or withholding nitrogen.

Second, nitrogen plays a major role in turfgrass heat, drought and cold stress tolerances by its effect on rooting, plant carbohydrate levels and plant hydration.

Third, the turfgrass plant contains more nitrogen than any other element.

Fourth, nitrogen is a very dynamic element in the soil system. Its concentration is constantly changing, usually decreasing. The other essential elements are significantly more stable in soils. Nitrogen, therefore, must be routinely added to turfgrass to maintain a soil level sufficient for turfgrass growth.

An ideal nitrogen fertilization maintenance program on established turfgrass should provide for very slow to moderate uniform topgrowth throughout the growing season (Figure 1). The ideal program should supply enough nitrogen to stimulate some growth and green color to maintain turf quality and recuperative potential, where necessary. Rapid changes or surges in topgrowth, sometimes referred to as peak and valley growth or feeding, are undesirable from both an agronomic and maintenance standpoint.

Turfgrass shoot growth can be largely managed by the (1) amount of nitrogen applied; (2) type of nitrogen applied and (3) timing of the nitrogen application. Fast-release sources (e.g. urea) are readily available for the plant’s use. They stimulate a relatively rapid plant/growth response.

Slow-release sources (e.g. methylene urea, sulfur-coated urea, IBDU) provide a time release of nitrogen to the plant. This results in a more uniform or controlled growth.

Fast-release/slow-release nitrogen combinations are typically used to control turfgrass growth and provide safety. Higher nitrogen rates generally stimulate greater turfgrass shoot growth.

continued on page 40
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Nitrogen rates are usually limited to 1/2 to 1 pound per 1,000 sq. ft., especially with fast-release nitrogen sources. This avoids undesirable shoot growth surges during periods favorable for shoot growth (i.e. spring on cool-season grasses).

Recent nitrogen fertilization philosophy has been to limit nitrogen levels. This helps to avoid excessive topgrowth and adhere to a slow-to-moderate shoot growth concept.

This philosophy stems in part from the impact that nitrogen has on rooting and plant carbohydrate levels. Carbohydrates (sugars) support growth of plant parts (e.g. shoots and roots) and assist in recovery from injury. Carbohydrates are also the key source or energy for maintaining all the plant's growth and physiological processes.

Nitrogen applications favor turfgrass growth. As nitrogen rates are increased, more topgrowth is usually produced. More topgrowth results in more carbohydrate use to support this growth. A key physiological principle is that under rapid growth, shoots take priority over roots, rhizomes and stolons for available carbohydrate. Shoot growth will continue to respond to higher nitrogen levels, distinctly suppressing root growth and other growth processes.

These effects are well illustrated in a fertilization study evaluating the response of a Merion Kentucky bluegrass sod to incremental rates of nitrogen (topgrowth) and nitrogen content of clippings.

In contrast, sod strength, a reflection of root and rhizome growth, and rhizome weight decreased at higher nitrogen levels. Thus, when most of the plant's carbohydrate was directed toward shoot growth, root and rhizome growth suffered accordingly. Agronomists well recognize that a plant's stress tolerance is directly related to the depth and mass of the plant's root system.

Research at Ohio State University has shown that root initiation and root growth of cool-season grasses occurs in the spring and again in the fall (Figure 2). Liberal nitrogen fertilization in the spring will have a tendency to restrict root growth in favor of shoot growth. The turfgrass plant will go into the summer with a shorter root system than when low-to-moderate rates of nitrogen fertilizer are used.

These rates are often recommended during the spring. Furthermore, high rates of nitrogen will increase topgrowth and increase the need for spring mowing. Rapid topgrowth may result in the removal of large amounts of clippings at each mowing. The removal of more than a third of the foliage at any one mowing retards both root and tiller development.

A reduction in root growth at this time is extremely critical since spring is an optimum time for root growth. A lot of "good root growth growing time" can be lost in the spring by heavy nitrogen applications.

Thus, mismanagement of nitrogen during the spring can have a dramatic effect on the root system under the turfgrass going into the summer. This, in turn, means a significant influence on stress tolerance.

---

**Figure 1.** A slow to moderate, uniform growth is most desirable in turfgrass fertilization programs. Nitrogen is the "growth control" element.

---

### Table 1:

**Essential Plant Nutrients Required for Turfgrass Growth and Development**

<table>
<thead>
<tr>
<th>Macronutrients</th>
<th>Typical Percentage in Turfgrass Tissue</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>3-6</td>
<td>Commonly used in maintenance fertilization at ratios of 3-1-2 to 5-1-2. Additional P and K (corrective) may be necessary where inherent soil levels are low.</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>0.2-0.5</td>
<td>Usually only applied where a specific deficiency has been diagnosed. Used in ratios similar to P.</td>
</tr>
<tr>
<td>Potassium</td>
<td>2-3</td>
<td>Usually only applied where a soil pH adjustment is required or on alkali soils.</td>
</tr>
<tr>
<td>Sulfur</td>
<td>0.2-0.3</td>
<td>-</td>
</tr>
<tr>
<td>Calcium</td>
<td>0.4-0.6</td>
<td>-</td>
</tr>
<tr>
<td>Magnesium</td>
<td>0.2-0.4</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Micronutrients</th>
<th>Typical Parts per million (ppm) in Turfgrass Tissue</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron</td>
<td>40-200</td>
<td>Iron is usually used to provide short term green color enhancement. Micronutrients primarily deficient on alkaline soils and/or soils with high phosphorus and/or high micronutrient levels (Mn, Zn, and Cu). Seldom deficient on fine-textured soils.</td>
</tr>
<tr>
<td>Zinc</td>
<td>40-120</td>
<td>-</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>0.1-0.2</td>
<td>-</td>
</tr>
<tr>
<td>Manganese</td>
<td>20-150</td>
<td>-</td>
</tr>
<tr>
<td>Copper</td>
<td>15-20</td>
<td>-</td>
</tr>
<tr>
<td>Boron</td>
<td>5-20</td>
<td>-</td>
</tr>
<tr>
<td>Chlorine</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

---

*Elemental percentages will vary to some extent depending on turfgrass species and cultivars, environmental conditions and other variables.*
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Circle No. 146 on Reader Inquiry Card
Timing of nitrogen applications is critical to a healthy turf with maximum stress tolerance. Heavy nitrogen fertilization during the spring and early summer is undesirable for cool-season turfgrasses. Environmental conditions are favorable for a rapid topgrowth surge at the expense of root growth. Lush, succulent growth is also produced from heavy nitrogen in the spring. This takes the turfgrass into the summer in a soft growth condition and more vulnerable to disease, heat and drought.

To avoid these latter disadvantages, late-season fertilization has been adopted for cool-season grasses. Late-season fertilization means application of nitrogen during that period of the year (late fall) that will favor root growth over shoot growth, and favor a positive carbohydrate balance in the turfgrass plant.

Cool-season turf shoot and root growth occur most readily in temperatures of 60 to 75 and 50 to 65 degrees Fahrenheit, respectively. Research at Ohio State University has shown that root growth of cool-season grasses will continue at soil temperatures close to freezing. Shoot growth will slow and eventually cease long before soil temperatures drop low enough to stop root growth. Roots can be actively growing while shoots above are brown and dormant. Late-season fertilization capitalizes on this differential in optimum temperatures and minimum temperatures for growth of shoots versus roots.

For the “late-season” concept to work successfully, turf must be green when the late-season nitrogen application is made.

On cool-season grasses, a late summer/early fall nitrogen application will ensure that the turf remains green before the late-season application.

Ideally, the late-season nitrogen application should be made when vertical shoot growth has stopped, but the turf is still green to produce carbohydrates via photosynthesis.

Air temperatures of 45 to 50 degrees Fahrenheit are usually necessary to ensure vertical shoot growth and stoppage of cool-season grasses. Since temperatures will be at a point that stops roots, cool-season grass rhizomes and stolons will capitalize on any applied nitrogen and carbohydrate produced. The carbohydrate produced by the green turf will be more efficiently used for root, rhizome and stolon growth during the late fall, winter and spring.

Research at Ohio State University has shown a significant increase in both root growth rates and root numbers (Figures 3 and 4) from late-season nitrogen fertilization. A more positive carbohydrate balance also was provided from late-season fertilization compared to a spring/summer fertilization.

Nitrogen applications during the late season, if timed properly, will extend greening later into the fall and winter. Spring green-up will usually occur earlier.

In general, the turf’s “greening period” from late-season fertilization can be extended four to eight weeks during late fall and early spring. This is a sound practice both agriculturally and aesthetically.

Typically, spring color of late-season fertilized turf remains quite good until late May or early June. Then the effects of nitrogen applied the previous fall begin to wear off. Spring appli-

**Poor fertilizer performance? It might be ammonia volatilization**

Nitrogen loss from ammonia volatilization can result in poor fertilizer performance, according to David Kissel, researcher at Kansas State University.

Kissel says that as in leaching, losses of nitrogen by ammonia volatilization can make it necessary to re-apply fertilizer to restore the lawn to its original green color and vigorous growth.

Ammonia volatilization occurs when nitrogen is converted to a gas and released into the air. This nitrogen removal bypasses the turf and deprives a lawn of needed nutrition. Of the 16 elements needed for healthy turf development, nitrogen is by far the most important.

“Ammonia volatilization can take place when urea and urea-containing fertilizers are present on turfgrass surfaces, in the thatch layer, or very near the soil surface,” he says. Non-urea fertilizers are also susceptible to nitrogen losses from ammonia volatilization, but only when applied to the surface of alkaline soils.

Along with heavy thatch, a lack of rainfall or irrigation will increase the chances for nitrogen loss from ammonia volatilization because movement of applied fertilizer into the soil will be reduced. Kissel says that substantial losses can be avoided if irrigation or rainfall occurs within a few hours after fertilizer application.

If irrigation is not possible, and conditions are favorable for loss, he recommended using non-urea nitrogen or slow-release fertilizer, such as sulfur-coated urea or some of the new products, like N-Sure nitrogen solution, in combination with the regular nitrogen source.

Kissel addressed the ammonia volatilization problem at the Kansas Turfgrass Foundation meeting in Wichita, Kan. □
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Table 2:
Comparative Turfgrass Responses of Commonly Used Maintenance Nutrients — Nitrogen, Phosphorus and Potassium.

<table>
<thead>
<tr>
<th>Turfgrass Response</th>
<th>Nutrient</th>
<th>Nitrogen</th>
<th>Phosphorus</th>
<th>Potassium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shoot Growth</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoot Density</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grass Color (Green)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Root Growth</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Establishment Rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recuperative Rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wear Tolerance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heat Stress</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drought Stress</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cold Stress</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disease Incidence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Fairly strong relationship based on available research.

Table 3:
Nitrogen treatment effects on a Merion Kentucky bluegrass sod.

<table>
<thead>
<tr>
<th>Nitrogen Rate (lb/A/month)</th>
<th>Annual Clipping Yield (dry wt.)</th>
<th>Nitrogen Content % in Clippings</th>
<th>Sod Strength lb to tear</th>
<th>Rhizomes grams</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>463</td>
<td>3.0</td>
<td>146</td>
<td>99</td>
</tr>
<tr>
<td>15</td>
<td>1807</td>
<td>3.3</td>
<td>188</td>
<td>89</td>
</tr>
<tr>
<td>30</td>
<td>2555</td>
<td>3.6</td>
<td>130</td>
<td>120</td>
</tr>
<tr>
<td>60</td>
<td>5676</td>
<td>4.5</td>
<td>97</td>
<td>43</td>
</tr>
<tr>
<td>120</td>
<td>8447</td>
<td>5.4</td>
<td>67</td>
<td>14</td>
</tr>
</tbody>
</table>


Table 4:
A Comparison of Known Late-Season Fertilization Advantages on Cool- Versus Warm-Season Grasses.

<table>
<thead>
<tr>
<th>Late-Season Effect</th>
<th>Cool-Season Grass Response</th>
<th>Warm-Season Grass Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter hardiness</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Rooting</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Carbohydrate balance</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Fall color retention</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Spring greenup</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Spring mowing reduction</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Turf density</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Weed reduction</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Disease reduction</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Thatch accumulation</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

Plus (+) denotes a positive response, negative (−) denotes a negative response, (+ −) denotes a limited response and a blank indicates research information limited.

Potassium fertilization
Turfgrasses need potassium in relatively large amounts, second only to nitrogen. The potassium content of properly fertilized turfgrasses normally ranges from two to three percent. Potassium in maintenance fertilization programs has generally been applied in a ratio of 3:1:2 to 5:1:2, nitrogen-to-phosphorus-to-
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Phosphorus fertilization

Phosphorus usually enhances turfgrass establishment rate from seed or vegetative plantings and enhances root growth. In maintenance fertilization programs, phosphorus has generally been applied in ratios of 3:1:2 to 5:1:2 nitrogen-to-phosphorus-to-potassium.

Nitrogen-to-phosphorus ratios of 1:1 to 1:2 are recommended in establishing new turfgrass areas. Phosphorus deficiencies are, however, rarely observed in established turf areas unless their level in the soil is extremely low or an unfavorable pH exists.

Micronutrients

Micronutrient levels are usually adequate in most soils. In addition, these nutrients are needed in very small quantities. They are often supplied as impurities in commonly-used fertilizers, liming materials, top dressing, certain pesticides and irrigation water.

Sandiness increases the possibility for micronutrient deficiencies. However, most sands used for soil modification are not pure and are usually modified to some extent with soil or organic matter.

Thatch has been found to be greater under late-season fertilization than under spring/summer fertilization.

In general, micronutrient deficiencies are most likely to occur in alkaline soils (high pH). They are further aggravated by high soil phosphorus and high soil levels of other micronutrients. It is advisable to use both soil and tissue testing to define a micronutrient deficiency.

Iron is the micronutrient most frequently supplemented in turfgrass fertilization programs. Its more frequent use among micronutrients is primarily due to its capability to enhance turfgrass color.

Iron application of 1 to 2 oz. of iron carrier per 1,000 sq. ft. produces a relatively rapid dark greening response with a short residual of one to three weeks. Iron has been known to have positive influence on plant carbohydrate reserves. It more recently has shown to have a positive effect on drought hardiness.

LM

Figures 3 & 4. Late-season fertilization (O, N and/or D) significantly increased root elongation rates and root number during the following spring and early summer. Nitrogen was applied at one pound rates during the months indicated.

potassium. On low potassium soils, additional potassium may be necessary.

Recent research has demonstrated that increasing potassium levels result in improved root growth; an enhancement of heat, cold and drought tolerance; better wear tolerance and less chance of disease.

This research suggests a nitrogen-to-potassium ratio approaching 1:1. Higher analysis potassium fertilizers will be most beneficial before and during stress periods. Higher potassium levels prior to winter have been found to be extremely beneficial to warm-season grasses. They enhance winter hardiness and would certainly seem warranted in late-season fertilization of warm-season grasses.
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At the turn of the century, a railroad bridge stretched across Boulder Creek. The city of Boulder, Colo. replaced it with a footbridge. When that degraded, the city decided to renovate the bridge and the surrounding areas. Today, greenery highlights five major parks running throughout Boulder. The city completed the $3.2 million parks project in 1987, after two years of work. City employees did all the design and landscaping for the new park system. Bicyclists and pedestrians on the Boulder Creek Path pass over several bridges. This bridge, manufactured by Continental, connects all the municipal offices. The bridge is 58 feet long and eight feet wide. It’s made of treated Douglas fir timber with a 3X12 planking and black steel railing. It holds a 10,000 lb. vehicle load. The bridge cost $7,323, but the total price, including installation came to more than $25,000. The city park crew cares for the surrounding bluegrass turf and cottonwood trees.

Continental Bridges:
Circle No. 192 on Reader Inquiry Card

Thousands of people pass under this bridge during the annual Great Atlanta Raft Race. The Span-Rite bridge from GameTime connects the banks of the Chattahoochee River, which winds through the national recreation area in Atlanta, Ga. The federal park area consists of 14 park units stretching 48 miles and totalling 4,000 acres. Hikers and picnickers cross over this five-year-old pedestrian bridge in the Powers Island unit. The bridge is 120 feet long and eight feet wide. It’s pressure-treated southern yellow pine wood deck and sandblasted structural steel railing blend in with the natural setting. The surrounding woods consist of pine and hardwood trees, including maple and oaks.

GameTime Bridges:
Circle No. 193 on Reader Inquiry Card
Students and researchers alike enjoy this bridge while jogging and biking through the Oregon Graduate Center Science Park in Beaverton, Ore. The Western Wood Structures' bridge spans 45 feet over Commons Lake. It has a six-foot walkway, 42-inch high pedestrian rail, and holds an 85 PSF live load. The 1 1/2-acre lake gets its name from the 15-acre Commons area in the center of the park. Landscape architect Mark Hadley of Wilsey and Ham designed the project. The three-level lake works as a water feature as well as a reservoir for park irrigation. The architects planted 20- to 25-foot Douglas fir and pine trees to fit in with the existing landscape. The bridge, installed in September 1986, cost $8,400, not including the foundations.

Western Wood Structures:
Circle No. 190 on Reader Inquiry Card

Wilsey and Ham:
Circle No. 191 on Reader Inquiry Card

Golfers aiming for the No. 5 hole on the Wayne Public Golf Course in Bothell, Wa. might walk over this bridge to retrieve a ball. In fact, skin divers have been known to fish for missed balls in the Semmamish Slough river. The course installed the bridge in the spring of 1987 when the old bridge started decaying after 25 years. The deck, which is 142 feet long and seven feet wide, is concrete to prevent golfers' cleats from digging into the wood. Tyee Timber supplied the Douglas fir wood railing, while the Wycoff Co. treated the wood used on the bridge. Centrac engineering designed and built it. The golf course turf near the bridge is Poa annua.

Tyee Timber:
Circle No. 194 on Reader Inquiry Card

Wycoff Co.:
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Centrac:
Circle No. 196 on Reader Inquiry Card
HOW TO PREVENT DOLLAR SPOT & BROWN PATCH FROM RUINING YOU ON INSPECTION DAY.

PREVENT DOLLAR SPOT, BROWN PATCH AND OTHER DISEASES EARLY, BEFORE THEY BECOME A PROBLEM.

You don’t want to be put on the spot; use the Banner® preventive program. Banner works systemically to control disease from the inside out. Once absorbed by the leaf and stem system, Banner won't wash off and keeps on working after drying, unaffected by rain or irrigation. Used as directed, Banner is safe to turf and applicators.
THE BANNER PREVENTIVE PROGRAM

How to prevent dollar spot
Apply Banner at a 1 oz. rate early (April-May through September) to prevent dollar spot from ruining your greens for full 28-day control.

How to prevent brown patch and other diseases
Apply Banner at the 2-4* oz. rate (May or June through September) for 10-21 day brown patch control. And at 1-2 ozs., Banner provides excellent systemic control of anthracnose, powdery mildew, rust, red thread and stripe smut. Or, use Banner at the higher 2-4* oz. rate to achieve broader-spectrum control of leaf spot and melting out for 14-21 days. And the 4* oz. rate for summer patch and spring dead spot at 30-day intervals.

Tank mix Banner to control already-present brown patch
As with all turf fungicides, Banner’s scheduling is critical. But when schedules are interrupted and brown patch is present, use Banner at a 2 oz. rate in a tank mix with contact fungicides like Daconil 2787* or Chipco* 26019. The contact fungicides will control existing diseases and Banner will prevent future infections.

New Banner. Unsurpassed protection for greens, tees, and fairways. And you’ll know it on inspection day. *4 oz. label rate pending.

Banner. Longer lasting, preventive control.
Weeds are a fact of life. No turfgrass area or landscape will remain weed-free without intervention.

To establish and maintain an attractive, healthy lawn, weeds must be controlled. Maintenance practices such as mowing too low, over-irrigation, over-fertilization, using unnecessary heavy machinery, and poorly timed aerification can result in stress conditions that encourage weed infestations.

A good management program with both cultural and chemical program will help reduce these stress factors. A successful weed control program in cool-season turf results from integrating a recommended cultural practice program and a complete weed control program.

An effective weed control program uses herbicides only when necessary. Producing a dense, healthy stand of turfgrass is one way to control annual grassy weeds and other broadleaf weeds. Proper mowing height and frequency, fertilization and irrigation are part of the weed control program and should be practiced throughout the growing season.

Turfgrass managers should be familiar with the following steps for a successful weed control program.

1. Knowing the specific weed problems: in relation to weed identification (grassy weeds vs. broad leaf weeds), life cycle of the weeds (annuals vs. perennials).

2. Selection of the right herbicide: in relation to effective weed control, turfgrass tolerance.

The most common annual grassy weeds include large crabgrass, small crabgrass, yellow foxtail, green foxtail, fall panicum, barnyardgrass and goosegrass. Crabgrass and goosegrass are the most troublesome weeds in turf. Crabgrass (Digitaria spp.) is among the most difficult weeds to control in turf.

In northern regions, seeds of crabgrasses (smooth and large) begin to germinate in late April to late May and continue to germinate throughout the summer. However, in transition regions, germination can occur as early as late March. Crabgrass germination is related to soil temperature. When the soil temperature reaches 65°F crabgrass begins to germinate.

This varies with the local conditions of soil type, rainfall, and weather in the spring. In general, most

This picture, taken 10 weeks after a pre-emergence herbicide application, shows the effective control of annual grassy weeds.
crabgrass seeds germinate during a six- to eight-week period. And most other annual grassy weed seeds germinate during this germination period.

**Selective weed control**
The selective control of these grassy weeds and some broadleaf weeds can be obtained with pre-emergence herbicides. Pre-emergence herbicides provide effective control for several weeks or months, depending upon dosage and products.

The effectiveness of these compounds is based upon their ability to provide good weed control, turfgrass tolerance, and long residual control. The primary pre-emergence herbicides for grassy weed control in cool-season turfgrasses are benefin, bensulide, DCPA, oxadiazon, pendimethalin, and siduron (Table 1).

Benefin, Team (a pre-mix combination of benefin and trifluralin), DCPA is also effective in controlling common chickweed, carpetweed and common purslane.

In addition, pendimethalin controls goosegrass, barnyardgrass, fall panicum and some annual broadleaf weeds such as hop clover, yellow wood sorrel and prostrate spurge. Pendimethalin applied during the late summer to early fall can control common chickweed, mouse ear chickweed, and henbit. Repeat application at the recommended rate eight weeks after the initial application may prevent goosegrass and heavy infestations of spurge. Oxadiazon controls hop clover, prostrate spurge and speedwell. Oxadiazon is more effective in goosegrass control than DCPA. Pendimethalin and DCPA control prostrate spurge, while benefin and bensulide are ineffective in controlling this weed.

Prodiamine (Blockade) is a new pre-emergence herbicide. It is expected to be in the market in the near future. It is very effective in controlling most annual grassy weeds such as crabgrass, goosegrass, bluegrass and several broadleaf weeds. It provides long residual control of weeds.

**Timing applications**
Timing is very important for herbicide applications. The best time for annual grassy weed control is to apply before weeds emerge. The key point is that pre-emergence herbicides need to be applied before grasses germinate in the spring. Treatments made too late (i.e. after germination) will not control emerged grassy weeds.

If application timing does not coincide with the normal germination period of annual grassy weeds, weed control results may be erratic or poor. In general, pre-emergence herbicides should be applied two weeks prior to the expected weed seed germination period. Therefore, the application dates of pre-emergence herbicides will vary from one part of the country to another.

The herbicides should be watered-in so that the chemical can form a barrier in the soil prior to weed seed germination. The resulting chemical barrier should not be disturbed during key weed germination period.

**Complementary effects**
Post-emergence grass control can complement a pre-emergence weed control program when poor weed control results are obtained. The primary post-emergence herbicides for grassy weed control in cool-season turfgrass are the arsenates: MSMA, DSMA, and AMA. These compounds can be phytotoxic, especially when applied during hot weather. A new post-emergence herbicide, fenoxaprop (Acclaim) is now available for annual grassy weed control. Fenoxaprop is very effective in large crabgrass, goosegrass, fall panicum, giant foxtail, barnyardgrass and other grassy weed control. This compound offers a wider window of post-emergence control than the arsenates with less potential for turfgrass injury. Fenoxaprop is recommended for use on perennial ryegrass, fine fescue, tall fescue and Kentucky bluegrass turf.

**Longevity of pre-emergents**
A complete weed control program aims at controlling weeds for the entire season. Season-long control of weed species is dependent upon the activity and longevity of the herbicide in use.

Oxadiazon, pendimethalin, Team and bensulide provide long residual weed control, while benefin is of short residual. On the other hand, DCPA is an intermediate type. Turfgrass managers should keep in mind that soil residual activity is also dependent upon the rate of herbicide being used.

In general, the higher the rate of application, the longer is the residual control over the growing season. Initial application determines the concentration in the soil for pre-emergence activity. It must maintain a critical soil residue level during the growing season for season-long weed control.

Turfgrass managers should keep in mind that application made early in the season may break in the soil to below the threshold level. When this occurs, one can expect less than desirable control following late germinating weeds. Repeat application of certain herbicides may be made 10 to continued on page 55

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**Table 1.**

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Trade Name(s)</th>
<th>Formulation</th>
<th>Recommended Rate (pound active per acre)</th>
<th>Company</th>
</tr>
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<tbody>
<tr>
<td>Benefin</td>
<td>Balan</td>
<td>2.5G, 2.5G</td>
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<td>Elanco</td>
</tr>
<tr>
<td>Benefin &amp;</td>
<td>Team</td>
<td>2G</td>
<td>1.5-3.0</td>
<td>Lesco</td>
</tr>
<tr>
<td>Trifluralin</td>
<td>(1:2)</td>
<td>1G</td>
<td>*</td>
<td>Lesco</td>
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<tr>
<td>Bensulide</td>
<td>Betasan</td>
<td>4E, 7G, 12.5G</td>
<td>7.5-10.0</td>
<td>ICI</td>
</tr>
<tr>
<td></td>
<td>Pre-san</td>
<td>4E, 7G, 12.5G</td>
<td>*</td>
<td>Mallinckrodt</td>
</tr>
<tr>
<td></td>
<td>Lescosan</td>
<td>4E, 7G, 3.6G</td>
<td>*</td>
<td>Lesco</td>
</tr>
<tr>
<td></td>
<td>Betamac</td>
<td>4E</td>
<td>*</td>
<td>PBI Gordon</td>
</tr>
<tr>
<td></td>
<td>Weedgrass</td>
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<td>*</td>
<td></td>
</tr>
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<td>Preventer</td>
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<td>12.5</td>
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<td>Dacltal</td>
<td>75WP</td>
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<td>Ferrantia</td>
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<td>Dacltal</td>
<td>5G</td>
<td>*</td>
<td>Lesco</td>
</tr>
<tr>
<td>Oxadiazon</td>
<td>Ronstar</td>
<td>50WP, 2G</td>
<td>3.0-4.0</td>
<td>Rhone Poulenc</td>
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<tr>
<td>Oxadiazon +</td>
<td>Goosegrass/</td>
<td></td>
<td>6.56G</td>
<td>Scotts</td>
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<td>Bensulide</td>
<td>Crabgrass</td>
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<td></td>
</tr>
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<td>Pendimethalin</td>
<td>Lescosan Pre-M</td>
<td>60DG, 60WDG</td>
<td>1.5-3.0</td>
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<td></td>
<td>Weedsgrass</td>
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<td>*</td>
<td>Scotts</td>
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<tr>
<td></td>
<td>Control</td>
<td></td>
<td>*</td>
<td>Scotts</td>
</tr>
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<td></td>
<td>Halts</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Crabgrass</td>
<td></td>
<td>*</td>
<td>Scotts</td>
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<tr>
<td></td>
<td>Turf Weedgrass</td>
<td>2.45G</td>
<td>*</td>
<td>Scotts</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td></td>
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<tr>
<td>Siduron</td>
<td>Tuperson</td>
<td>50WP</td>
<td>2.0-6.0</td>
<td>Du Pont</td>
</tr>
</tbody>
</table>

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**continued on page 55**
Troubled waters?

**Otterbine Aerators**

The prescription for troubled breathing, poor circulation, and changing temperatures in ponds and lakes is practical engineering that is esthetically pleasing.

These aerators range in power, circulating from 600,000 to 20 million gallons of water in a 24-hour period. Each complete, turnkey system is delivered fully assembled; no special pumps or foundations are required.

Striking patterns begin with the Starburst, Rocket, Sunburst, Constellation, or Phoenix working alone or mingled together. Add the Otterbine Fountain Glo™ lighting system for spectacular evening display as well as security or the Rock Float Cover for the illusion of natural spray.

Otterbine Aerators meet the water management needs of golf courses, parks, recreational lakes, office developments, and residential condominiums. Call or write for more information:

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Emmaus, PA 18049

215/965-6018
12 weeks after the initial application for continued control of late germinating weeds over the entire season.

**Turfgrass tolerance**

Cool-season turfgrasses vary in their tolerance to pre-emergence herbicides. Siduron is the only pre-emergence herbicide that is recommended for newly-seeded turfgrass. All other pre-emergence herbicides are recommended for use on established fine fescues, Kentucky bluegrass, perennial ryegrass and tall fescue. However, bensulide and DCPA can be applied in the spring following a fall seeding of cool-season turfgrasses.

Pendimethalin is not recommended for use on bentgrass or where annual bluegrass is the desired species. Benefin, DCPA and oxadiazon are not recommended for use on fine fescues or bentgrass turf. However, bensulide can be used on bentgrass. Team is recommended for use on most cool-season grasses. It may thin established annual bluegrass turf and fine fescues at rates above 1 1/2 lbs. active ingredient per acre.

It should not be applied in the spring to turfgrass planted the previous fall. Team is not recommended for use on creeping bentgrass. However, it can be used on bentgrass fairways.

**Reseeding time interval**

Time for reseeding is very important in relation to the application date of pre-emergence herbicides. In general, pre-emergence herbicides persist in the soil for a length of time, allowing season-long weed control. Reseeding interval is dependent upon the herbicide and dosage used (Table 2).

For example, reseeding should be delayed at least six weeks after application of Team at the lower end of recommended rate. However, when using the highest recommended rate, reseeding should be delayed at 12 to 16 weeks after the application. When reseeding, it is essential that proper cultural practices such as soil cultivation, irrigation and fertilization be followed.

In summary, a successful pre-emergence weed control program results from selecting the right herbicide and applying it uniformly at the proper time and appropriate dosage. The herbicide selection depends on the weeds to be controlled and the turfgrass to be treated.

Choose the most effective herbicide with maximum safety to the turfgrass. Changing the use of one class of herbicide to another class in a weed management program may provide a broad spectrum weed control in lawns. For crabgrass and other grassy weed control, turf managers and lawn care operators should emphasize a pre-emergence herbicide program along with a good management program. This approach will minimize the competitive advantage of efficient species like crabgrass.
Pre-emergence weed control is more than applying the right herbicide at the right rate. It requires a knowledgeable turf manager. Often the manager must be able to manage the turf for multiple uses such as recreation, visual effects and athletic events.

Frequently, several species are involved. Knowing cultural practices needed to make the turf vigorous without inviting damage from diseases or other stresses is essential. Management practices are generalized about mowing height and frequency, fertilization amount, and frequency, time of aeration and irrigation. These practices need to be site-specific. Assuming all of the practices are correct, the manager must then think of tipping the balance against weeds.

Before beginning a weed control program, determine the weed species to be controlled using identification aids.

Local university advisors, nurseries, industry representatives or people at the botanic gardens are available to assist. If there are many species or if perennial weeds are present, a single pre-emergence material will not be adequate.

### Choosing a herbicide

Many herbicides are available for warm-season turf. They differ by the weeds controlled, their safety to the various turf species and residual control. Some herbicides (atrazine, simazine and pronamide) also give some post-emergence control.

<table>
<thead>
<tr>
<th>EXCELLENT</th>
<th>Prostrate Spurge Control</th>
<th>Crabgrass Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pendimethalin</td>
<td>Bensulide, pendimethalin, oryzalin, trifluralin</td>
</tr>
<tr>
<td>GOOD</td>
<td>DCPA</td>
<td>Benefin, siduron, oxadiazon, DCPA, napropamide</td>
</tr>
<tr>
<td>FAIR</td>
<td>Oxadiazon, siduron</td>
<td></td>
</tr>
<tr>
<td>POOR</td>
<td>Bensulide, napropamide</td>
<td></td>
</tr>
</tbody>
</table>

(Based on consistence, length of control, and completeness of control)
Pre-emergence materials form the basis for controlling annual grass and many broadleaf weeds in turf. Once the weeds are controlled and the management practices have been changed to keep the weeds from re-invading, then good vigorously-growing turf can exclude most weeds.

Herbicides are applied in the spring to control summer annual grasses or broadleaves. They are applied in the fall for winter annuals. The germination times of large crabgrass, smooth crabgrass, prostrate spurge, goosegrass or foxtails all differ.

**Timing applications**
The manager must be able to time the application so the herbicide is in the germination zone at the first germination. One application may not be long enough to control the weeds for the full season, as is often the case in southern California, Texas, Florida, Georgia, etc.

These areas have an exceptionally long weed germination period. Since the soils are warmer and the temperature higher, herbicides degrade faster than in cooler climates. Greater amounts of water increase the loss of herbicides. A second application must be made to have enough herbicide in the germination zone to control all weeds.

The turf manager can affect timing of germination by turf quality. Areas that have bare soil warm up quicker in the spring and weeds germinate in these areas before cooler, tight-growing areas. With good quality turf, the herbicide can be applied later giving better control that lasts longer.

Pre-emergence herbicides are usually used in the early spring for crabgrass (large and smooth), goosegrass, sandbur, foxtails and prostrate spurge.

Knotweed can sometimes be a problem. In the fall of the year, materials are used for annual bluegrass, common chickweed, henbit and speedwells.

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**Table 1.**

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Trade Name</th>
<th>Formulations</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atrazine</td>
<td>Aatrex</td>
<td>80W, 90DG, 4L</td>
<td>Ciba-Geigy</td>
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<tr>
<td>Benfen</td>
<td>Purge</td>
<td>2.5G</td>
<td>Security</td>
</tr>
<tr>
<td>Benfen + oxazalin</td>
<td>XL</td>
<td>2G</td>
<td>Elanco</td>
</tr>
<tr>
<td>Benfen + trifuralin</td>
<td>Team</td>
<td>2G</td>
<td>Elanco</td>
</tr>
<tr>
<td>Benfen + oxadiazon</td>
<td>Benesulan</td>
<td>2G</td>
<td>Elanco</td>
</tr>
<tr>
<td>Benesulate</td>
<td>Betasan</td>
<td>2G</td>
<td>Elanco</td>
</tr>
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<td>Bensulide</td>
<td>Betasan</td>
<td>2G</td>
<td>Elanco</td>
</tr>
<tr>
<td>Bensulide + Oxadiazon</td>
<td>DCPA</td>
<td>5.25G + 1.31G</td>
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<td>Ethofumesate</td>
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<td>Fermenta</td>
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<td>Surfan</td>
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<td>Nor-Arn</td>
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<td></td>
<td>Kerb</td>
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<td>Elanco</td>
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<td></td>
<td>Topersan</td>
<td>80W, 90DG, 4L</td>
<td>Ciba-Geigy</td>
</tr>
</tbody>
</table>

Goosegrass should be treated in the early spring with a pre-emergence herbicide.

**FEBRUARY 1988/LANDSCAPE MANAGEMENT 57**
The choice is yours. Whether your customers need season-long preemergence weed control by itself or on fertilizer from leading formulators, Team fits.

Either way, you can control crabgrass and goosegrass season-long with just one application. Or even a split application, if need be, to better fit your program.

Team granular also fits your high standards of annual grass weed control. University tests show it's outstanding. Team gets to the ground and stays put to form a zone of protection that keeps weeds out all season long.

And Team does all this without hurting your turf, including sensitive bentgrass.

So spread it straight in granular form. Or spread it on fertilizer available from leading formulators. Team fits your program. See your Elanco representative. Or call toll-free: 1-800-352-6776.

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Lilly Corporate Center
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Team™ — (benefin + trifluralin, Elanco)
Refer to Team label for complete use directions.
Other weeds can be found locally, or are isolated problems. If perennial weeds have been established in the turf and have seeded, then pre-emergence herbicides may be needed to control the germinating seeds of these weeds (Dallisgrass or Bermudagrass for example). The established plants must be controlled by post-emergence herbicides.

**Overseeded turf**

Overseeding of warm-season grasses is a concern when using herbicides. The pre-emergence material controlling crabgrass or goosegrass must be broken down so annual ryegrass can germinate and establish. Applications of herbicides for annual bluegrass control can be a problem.

Benefin has been used for annual bluegrass control. It can also be applied early in the season (August), giving early control. The ryegrass can be seeded about 45 days later. Bensulide has stunted overseeded ryegrass turf at 45 days. The residual of bensulide is usually two or three times longer than benefin in California turf.

Ethofumesate may be applied 20 to 30 days after overseeding. It should be applied to dormant Bermuda or suppression can occur in the spring.

Fenarimol, a fungicide, applied two weeks prior to overseeding, controls several turf diseases in addition to controlling the annual upright form of annual bluegrass. It has not controlled the low-growing perennial form in mild climate areas.

Careful water management going into the fall will help reduce annual bluegrass invasion. Conditions that allow alternate wetting (rainfall or irrigation) and drying, so the seedlings can dry out and die, will decrease weed populations.

**Mechanical cultivation**

Also, timing of aeration or other mechanical cultivations is important. Aeration or verticutting during annual bluegrass germination allows open spaces in the turf for weeds to invade.

Always aerate or verticull before—never after—an application of pre-emergence herbicide. These operations just before herbicide treatment will reduce the thatch and give the herbicide a better chance to get to the soil where it is effective.

Pre-emergence herbicides, when properly timed at the right rate, can effectively control most annual weeds and be a good tool to help manage turf. They generally are safer to use on turf than post-emergence herbicides because they are being used to control seedlings rather than mature plants. There are many good materials from which to select to control your weeds.

---

**Table 2.**

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Bahia</th>
<th>Bermuda</th>
<th>Centipede</th>
<th>St. Augustine</th>
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<tr>
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T = tolerant; I = Intermediate tolerance, apply only to dormant grass
NR = Not registered

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Pre-emergence Herbicide Soil Longevity

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Circle No. 163 on Reader Inquiry Card
TURFGRASS CULTURE AND WATER USE

Different turfgrass species use water in different ways. New research helps to better explain this process.

by David Minner, Ph.D., University of Missouri

Over the last seven years, researchers have made advances in understanding turfgrass water use rate (WUR). Much emphasis is being given to the WUR associated with a particular turfgrass species, cultivar or cultural practice.

The idea is to develop grass systems that lose less water to the atmosphere and maintain more favorable soil moisture condition for plant growth.

Indeed, these low water use grasses and management practices are being defined, but turfgrass managers must understand that low water use does not necessarily mean less irrigation.

For example, WUR of creeping red fescue is nearly 15 percent less than that of tall fescue. But less water is needed by tall fescue to keep it at acceptable turf quality than the creeping red fescue.

Similarly, taller mowed grasses have higher WUR than shorter mowed grass, but the amount of irrigation needed to keep turfs at acceptable levels is less for the taller grass than the shorter.

In both examples, a deeper root system associated with tall fescue and continued on page 62

A RELATIVE COMPARISON BETWEEN TURFGRASS GROWTH AND WATER USE

A boundary layer with less air movement has a higher water vapor content.

More air mixing in open turf canopies increases water use rate.

An open canopy with upright leaves decreases canopy resistance and increases water use rate.

A tight dense canopy with horizontal leaves increases canopy resistance and decreases water use rate.

The ideal turf situation for water conservation would have a low water use rate as the result of a dense horizontal canopy with reduced vertical leaf expansion; and a reduced need for irrigation as the result of a deep expansive root system.

Excessive nitrogen can result in shallow rooting and increased vertical leaf expansion. The combined result is an increased water demand by the canopy and a decreased water supply by the root system.

A deeper root system helps avoid drought stress.

Important Note: The intent of the above diagram is to show the relationship between turfgrass growth and water use. It should be understood that a decreased water use rate does not always result in water conservation and a reduced need for irrigation.
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Circle No. 143 on Reader Inquiry Card
taller mowed turf than that associated with creeping red fescue is responsible for reducing the need for supplemental irrigation. The deeper root system is able to extract water from a larger volume of soil compared to a shallower less extensive root system.

In time, research will define lower water use in terms of a reduced need for irrigation. Until then, research results associated only with WUR should not become management policy. Soil and plant systems that use less water and need less irrigation are key components of a water conservation program.

**Mowing**

The two major aspects of mowing that influence water use are height and frequency. Grasses mowed at higher cutting heights have a reduced canopy resistance and, therefore, use more water than short mowed grass. Mowing frequently and short increases turf density.

Dense turf resists the upward movement of water vapor through the turf canopy. A dense turf with a tight canopy also resists air movement down into the turf canopy.

The net result is less moisture lost from the turf canopy to the atmosphere. This process ultimately reduces turfgrass evapotranspiration (ET). With higher mowed turf the leaf canopy that expands above the mowing height is less dense. This allows for more air mixing that results in higher water use rates.

It is important to note that taller grass transpires more water, but has a more extensive root system that draws water from a larger soil reservoir than shorter grass. Thus, taller grasses avoid soil drought and plant wilt by expanding their roots into soil areas with enough moisture.

In contrast, lower mowing heights result in limited root systems that need more frequent irrigation to supply water to a shallower root system.

Therefore, turf managers interested in reducing irrigation needs should mow frequently at the highest feasible height. These management practices enhance canopy resistance and minimize detrimental rooting responses.

**Nutrition**

Fertilization is often needed to manipulate turfgrass function. Grass performing well with little help from fertility is already at maximum water use efficiency with regard to quality. The primary goal of turf fertilization should be an increased shoot density with less emphasis on a darker green color. Turfgrass managers should strive to meet, but not exceed, the nutritional needs of the turf.

Nitrogen is the primary nutrient used to regulate turfgrass density and color. Water use rate increases with increased nitrogen nutrition. This occurs because leaf expansion above the normal mowing height occurs at a much faster rate. Leaves forced into this upper boundary layer lose water at a faster rate because they are in an area of greater air movement and reduced canopy resistance.

It is difficult to determine the level of nitrogen that will result in efficient water use. Many factors such as soil type, organic matter content, turf species and cultivar and use are involved.

In general, the soluble component of a nitrogen fertilizer should not be applied at rates that exceed 1 lb. N/1000 sq. ft. per application. Over-stimulation of growth with nitrogen is easily detected by excessive vertical leaf growth and an increased need for mowing.

Under these conditions, turf will have high WUR, and rooting development will be reduced. In time, excessive leaf growth will demand a greater water supply that cannot be met by the reduced root system. Turf wilt occurs more frequently as this imbalance develops.

What follows is usually a decision by the turf manager to increase the frequency—and sometimes the amount—of irrigation to offset the symptoms of wilt.

In severe situations, excessive irrigation can lead to reduced oxygen levels in the soil. The end to this scenario is usually "wet wilt," which occurs when the plant's demand for water cannot be met even though soil is visibly moist.

In this case, a poor functioning root system resulted from an increased water demand. This increase was, in turn, caused by improper nitrogen fertilization and frequent irrigation. Turf managers interested in conserving water should use the lowest amount of nitrogen that gives the desired turfgrass quality and function.

Potassium and iron are two additional elements that may give the turf...
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J-7-8
Chemicals and turf water use

Various chemicals, such as pesticides and plant growth regulators (PGRs), are used in turfgrass management. Since they influence turfgrass growth, leaf area, rooting and canopy resistance, they also influence water use.

Anti-transpirants are not routinely used in turf culture but have received some attention since they have the potential to reduce ET. They reduce water use by inducing stomatal closure or by covering the stomata with a film.

Anti-transpirants may cause a detrimental effect on photosynthesis and evapotranspirational cooling. Manipulation of turfgrass morphology or canopy offers a greater potential for reducing ET than does regulation of stomatal functions by anti-transpirants.

Wetting agents have received limited testing in terms of water conservation. They do offer the advantage of increasing water infiltration rate on compacted soils, thatchy turf and hydrophobic sands.

Moving water into the soil faster may or may not affect ET. But it will make scheduling irrigation easier and reduce the chance for wasteful water runoff. Wetting agents used on steep slopes or mounded areas can reduce the need to over-irrigate or hand water contoured areas to maintain adequate soil moisture.

Pesticides are often needed in higher maintenance situations to provide a specific turfgrass function—generally improved appearance and density. In choosing a pesticide, more attention is given to efficacy. Little attention is given to what effect a product will have on the WUR, and more importantly the need for supplemental irrigation.

Herbicides, insecticides or fungicides are often applied alone or in combination with another. The information concerning the effect of pesticides on the WUR of turfgrass is limited.

At this time, we know that some pre-emergence herbicides cause reduced rooting. In high maintenance situations, reduced rooting may not evoke a visual response in turf appearance, since increased fertility and irrigation offset a decline in turf appearance.

As less water is available for turfgrass, additional injury from some pesticides may occur. Turf managers interested in conserving water...

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manager an extra edge in managing turf exposed to drought stress. So far, research conducted in this area has shown improved turf performance under dry conditions, but no reports have documented the potential size for water conservation programs.

Potassium and iron have been reported to increase root growth which may account for their role in reducing wilt and improving drought avoidance. Reduced levels of nitrogen combined with iron can result in turf greening similar to normal rates of nitrogen. The implication here is that applications of iron plus nitrogen, especially in the spring, will result in a lower rate of vertical leaf growth and reduced WUR.

Irrigation

Current irrigation practices have probably evolved partly as a result of the equipment available for irrigation rather than a complete understanding of turfgrass water needs. Manual sprinkler systems, such as quick couplers, moveable pipe and traveling sprinklers required a lot of labor for a single irrigation. With these systems, it was desirable to provide as much water as possible during a single irri...

continued on page 66
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CHEMICALS from page 64

should avoid pesticides that have a history of causing slight phytotoxicity, reduced root growth or both. With or without visual symptoms of phytotoxicity some turfgrasses may be stunted by pesticides.

This can alter the turf canopy by making it more resistant to water loss. Turf leaves are less likely to expand into the upper boundary layer where air movement and water loss occurs more rapidly.

Thus, pesticides that reduce growth may also reduce water use. But the net result of reducing the need for irrigation may be negligible, especially where root systems are decreased.

Some chemicals are selective herbicides at one rate and plant growth regulators at another. Chlorflurenol is now used as a broadleaf herbicide, but was previously used as a plant growth regulator.

Plant growth regulators are used to reduce the need for mowing and to inhibit seed head development. Since they influence plant height and leaf extension rate, they also influence canopy resistance and transpiration rate.

A 30 percent reduction in turfgrass evaportranspiration has been reported with products such as EL-500, PP-333 and Embark. Some experimental PGRs have shown improved summer performance during periods of solid drought. It is possible that spring-applied PGRs cause a reduced growth rate that conserves soil moisture and also provides a better carbohydrate balance for summer growth.

Whatever the cause, PGRs offer a promising area of research to investigate turfgrass water conservation and improved summer performance. At this time, some caution should be used when water conservation is your main goal. It is likely that some PGRs will cause reduced root growth associated with less leaf growth. This may impair any dryness avoidance mechanism inherent in a grass species. Also, some PGRs cause a flush of growth after the chemical wears off.

This additional growth may rapidly deplete stored soil water and negate any overall water conservation during the summer. It appears that PGRs which do not reduce root growth or cause a flush of growth may offer a means of water conservation.

—David Minner, University of Missouri

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gation. That reduced the number of times irrigation was needed. Water application by this method is very similar to the standard recommendation: irrigate as deeply and infrequently as possible to promote an extensive root system.

This recommendation is ambiguous, since it does not provide a basis for actual amount or frequency of water application.

The main purpose for irrigating deep (to the bottom of the effective root zone) and infrequently is to develop an extensive root system that continually expands into regions of available soil moisture. This prepares the plant to avoid soil drought.

The main disadvantage of irrigating too frequently has been cited as a shallow root system that becomes dependent on continued frequent irrigation.

Research in Colorado has indicated that turf appearance was best when water lost by ET was supplied by irrigation every two days. In fact, Kentucky bluegrass maintained an acceptable turf quality with 25 percent less water by irrigating every two days compared to 4.7 and 14 days.

This may sound like a contradiction continued on page 68

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tion to the accepted practice of deep and infrequent irrigation. But it instead should serve as a way to define what actual frequency of irrigation and amount of water are needed to provide a desired level of turf quality.

Another statement that often makes frequent irrigation unattractive as a possible water conservation technique is that WUR increases as irrigation frequency increases. This undisputed statement has been clearly documented by research.

These results have only observed water use as related to irrigation frequency rather than the water needed to provide the desired turf quality and function. Turfgrass managers should be more concerned with the amount of additional water that is needed by irrigation rather than the amount lost to the atmosphere. In many situations, turfgrass can perform quite well when water supplied by irrigation is less than the maximum WUR.

The advantages and disadvantages of irrigation frequency have been discussed. But no one fixed irrigation interval is better for plant growth or more efficient for water conservation than another.

Ideally, the interval between irrigation and amount of water applied at each irrigation should be ever changing. ET rates, rooting depth and even turf function are dynamic and change on a monthly, weekly and daily basis.

In semi-arid regions of the country, very light rains may occasionally occur. These rains of only a few 100ths of an inch are not likely to make a significant change in soil moisture. Irrigating during or immediately after these light showers will add to the efficiency of a rain; the added irrigation will increase soil moisture.

Cloudy, cool conditions associated with occasional summer rains in semi-arid climates are also an efficient time to irrigate. At that time, the evaporative demand is lower than normal conditions which promote high ET.

Turf managers with labor intensive irrigation systems will have fewer options available for saving water by precise irrigation scheduling. Automatic systems programmed for site-specific irrigation can more efficiently play the odds of rainfall by irrigating more frequently with less water.

In addition to advanced irrigation systems, instruments and techniques exist that can help the turf manager interpret the need for irrigation.

Electronic moisture sensing devices, tensiometers, Class A pan evaporation or combinations of these have been used to reduce water application by as much as 89 percent over conventional methods of scheduling irrigation.

Turfgrass managers should consult their local cooperative extension service and conduct on-site experimentation to determine if these techniques can help in water conservation programs.

**Soil cultivation**

Turfgrasses exposed to traffic often decline in growth because of soil compaction. Compacted soils are dense and poorly drained, resulting in less oxygen for root and shoot growth.

Reduced shoot and root growth are responsible for a lower water use rate. Soil coring and aeration will improve the quality of turf on compacted sites and also increase the water use rate. Even though core aeration increases water use, its advantages on compacted sites reduce the need for additional irrigation and enhance turfgrass drought avoidance.

Core cultivation should be avoided during hot, dry conditions. Excessive drying may increase the need for supplemental irrigation under these conditions.
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MINIMIZING TREE AND SHRUB HEALTH PROBLEMS

In this age of valuable plant materials, the transplanting process must be done correctly. If it's not, the company stands to lose money.

by Terry A. Tattar, Ph.D., University of Massachusetts

Tree health problems with nursery stock can be placed into two broad categories: (1) pre-sale failure and (2) post-sale failure. Due to the high value of plants at the time of sale and to the role of the customer, the category of post-sale failure is most important to landscape managers.

No one expects the failure of plant materials that have been recently sold. The customer expects (usually there is a written or oral guarantee for a specific time period after purchase) that the tree or shrub purchased will remain healthy and vigorous after it has been transplanted. If the initial quality of the sold plants, the proper placement in the planting hole, or the follow-up care after planting have not all been performed correctly, the customer may be disappointed with the result.

The customer also will not be pleased with the seller.

Replacement of trees and shrubs that fail is costly to the seller and does not address a practical solution to this problem.

Let's explore some ways that landscape managers can minimize their losses in recent transplants.

Placement in soil

The correct placement of the tree or shrub would seem to be a simple and straightforward matter with little chance for error. Unfortunately, it isn't.

The confusion is often caused by the uncertainty over exactly where the root system begins, due to wrapping and ties that are not properly removed during planting, and due to settling in the planting hole of large stock with heavy root balls. In addition to how a plant is set in a planting hole, the location and condition of the planting hole can often be sources of transplant failure.

continued on page 72
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Hemp cords left around a newly transplanted shrub will eventually cause stem girdling.

Determining the correct planting depth of each tree and shrub is a critical first step in proper placement. To do this, you must first untie all cords around the trunk and peel back all wrapping to examine the lower trunk and soil ball. Using the point where the trunk buttress forms at the root collar is the best location to aim for.

If you cannot see this point, begin digging carefully by hand around the soil ball until the major roots are found. Just above these is the buttress swell and the correct planting depth. Soil stains on the lower trunk can be misleading indicators of proper depth, as soil may have been mounded up during cultivation.

Wrapping and cords around the root ball are great for handling and storage, but become somewhat of a liability once a plant is set in the planting hole. Cords, regardless of type, do not biodegrade rapidly and can girdle or strangle the trunk.

Cord location around the lower trunk can also give the mistaken impression that it represents the correct planting level. Many times, cords are wound around the stem at a point a considerable distance up the trunk from where the roots begin to form.

Wrapping can be a biodegradable material like burlap or can be a non-biodegradable material like plastic. Whether in a sheet or woven to look like burlap. Needless to say, non-biodegradable materials can cause a number of plant health problems if not removed at planting time.

Plastic wrap creates a low-oxygen/high-moisture condition that is ideal for microbial pathogens but not at all favorable for trees and shrubs. Plastic wrap is acceptable for transport and short-term storage, but often becomes deadly when placed into the transplant hole. Plastic "burlap" is not as bad as plastic wrap, initially, since it is a mesh. However, plastic "burlap" will only expand to a limited extent as roots pass through it, resulting in root girdling at the edge of the root ball.

Examination of all layers of wrapping and removal of any non-biodegradable wraps is a must for proper planting.

The planting hole
The planting hole is a key factor in transplant survival. There is a general agreement that it should be at least twice the diameter of the root ball, but what about depth, backfill material and drainage?

A deep hole, improperly packed, will allow substantial settlement downward of a heavy root ball, and create an unhealthy deep planting condition.

Use of high quality loam to fill the transplant hole around the ball is often a standard specification in landscaping contracts. However, much research on urban soils has shown that this practice often discourages the plant's roots from exploring soil outside the planting hole, and in the long run the tree or shrub becomes stunted or "pot-bound." Most urban soils are not similar to garden loam. Plants transplanted into them would adapt more successfully if parent soil were to be incorporated as much as possible into the backfill mix.

In addition, the resulting soil discontinuity can cause a "teacup" effect, where the soil around the tree is effectively isolated from soil moisture outside the planting hole. Surrounding soil can be wet, while the soil in the planting hole can be dry if soil texture inconsistencies exist around the planting hole.

Drainage out of the planting hole is crucial for essential aeration of the soil. Trees in poorly-draining holes usually die quickly from root suffocation.

The author, Terry Tattar, installs wire mesh to protect a crabapple from chewing animal injury during winter.
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tion. Fill the planting hole with water and check how long it takes to empty. If water remains overnight, downward or sideways drainage must be provided. Sometimes a clay hardpan exists beneath the planting hole that can be penetrated by digging a small hole. If this does not provide good drainage, a sideways French-drain can carry water away from the planting hole.

Once a tree has been set in the planting hole at the correct depth and backfilled, a water well is then constructed, and two to three inches of mulch is placed in it. Stakes or guys are installed to secure the tree and the trunk is wrapped to minimize chances of bark injury from sunscald. A final irrigation, and the tree or shrub is now properly planted. Or is it?

Follow-up care
If you feel that your work was done after the plant was set in the ground, you are overlooking a major cause of transplant failure: lack of post-planting follow-up. Post-planting problems fall into two general categories:
- continual care needed during transition to independent growth; and
- protection from biotic and abiotic stress.

The stakes, guys and cords around the trunk used to secure and protect the newly-planted tree can now strangle it if not loosened and eventually removed as the tree begins to grow.

Renew the mulch if it begins to break down and allows excessive weed growth within it. Use only organic mulch or some material for mulch that allows both water and gas exchange between air and soil.

Avoid plastic sheeting which can suffocate roots.

Watering is needed when rainfall is inadequate to minimize moisture stress. Supplementary watering may be needed at any time during the entire period when the ground is not frozen. Water wells should be leveled in the second growing season after planting to encourage roots to grow into soil outside the planting hole.

A newly-planted tree or shrub is vulnerable to many agents of destruction. Protection against chewing rodents (mice and rabbits are the most common) is often crucial for survival, especially in areas of high rodent populations.

Sometimes, the homeowners in their enthusiasm to "take good care of their plants" with extra tender-loving care cause injuries. Too much watering or too much fertilizer, for example, can be just as bad or worse than none at all.

Injuries from lawn mowers and, more recently, string trimmers, needlessly kill and disfigure many young trees and shrubs.

Non-biodegradable materials can cause a number of plant health problems if not removed at planting time.

Recommendations
A service to troubleshoot and manage health problems both before and after the guarantee period will decrease post-sale losses and provide an additional source of revenue. Many landscape operations already provide this type of maintenance service as part of their business.

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Taliking to insurance brokers can be like coming to this planet from a different place and time. Their language is strange and unintelligible. Why is this so?

First, most insurance companies don't understand landscape contractors and aren't interested in learning about the green industry.

The insurance industry, for the most part, views a landscape contractor as something smaller than a small business, operating out of a garage, with a pick-up truck or two, and merely mowing lawns and planting bushes. They also think the pick-up truck is loaded with illegal aliens ready to tumble out the back gate at the first corner.

Obviously, this small and morally unstable group of contractors isn't worthy of the insurance industry's understanding because they don't develop sufficient premiums to justify any attention. It remains rather pathetic that this perverse and grossly inaccurate perception is the norm within the insurance industry, with only a few exceptions.

Well, folks, there's a glimmer of hope. Those handful of insurance companies that do have a more accurate understanding of landscape contracting will be the ones you want to build relationships with over time.

As with the recent stock market crash, the insurance industry will become difficult again. Then, you'll want do business with those companies that understand you.

Dubious professionalism

The second problem confronting you is the rather dubious level of professionalism exhibited by so many insurance agents and brokers.

Here too it is imperative for you to find someone that truly understands your business and represents those companies that are going to get the job done in the best possible fashion for you. From my perspective, the best test of whether an agent can meet your needs is found in the ease in which they communicate or solve problems for you, all in language you can understand.

All of this nonsense does not have to be confusing. There is no reason that simple insurance questions cannot be reduced to simple answers. If the answers are not intelligible, keep talking to your peers within the industry and find a specialist with whom you can communicate.

Once all of this is completed, the responsibility will fall upon you, the business owner. And you would be wise to grasp a more complete understanding of your insurance needs so that you can be in better position to improve your image.

This is critical to differentiate your firm from the "average" or less-than-acceptable-risk companies. Being viewed as a better than average contractor will produce reduced premiums, if you are able to maintain an acceptable (near loss-free) track record.

Workers' compensation

You have a great deal more control over workman's compensation situations than you might guess. At a minimum, you should maintain workers' compensation coverage to cover job-related illness or injury to your employees.

Don't forget that a secretary running to the bank and being involved in an auto accident is job-related. Such claims are often more serious than routine cuts and scrapes.

Don't fall into the trap of considering all of your labor force as "independent contractors." That approach consistently does not hold water. You will be found responsible for their injuries if you provide them any benefits (tools, uniforms, rides to and from job sites, etc.) whether or not you maintain an actual insurance policy. If you do not now have an active safety program which, at a minimum, should include mandatory leather shoes, gloves, hearing protection on equipment, safety goggles, etc., you are not doing all you can do to reduce your potential for claims.

A good example of a way in which to reduce serious cuts from sharpening mower blades is to provide your employees with a pair of butcher gloves used in the meat cutting industry with palms of wire mesh to keep hands free of cuts.

Furthermore, annual classes on lifting techniques, done bi-lingually if necessary, will go great distances to reducing your workers' compensation claims.

Commercial auto

Your commercial auto policy is rather self-explanatory. Once again, make sure all of your vehicles, including trailers, are covered. At a minimum, make certain your insurance agent is maintaining and providing copies of your vehicle schedules, not just on the insurance policy endorsements.

continued on page 78
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This should all be updated at the beginning, mid-point and end of season to make certain nothing is missing. You ought to consider fairly sizeable deductibles on your commercial autos so as to reduce premium. You don’t need a $100 deductible on any vehicle in your fleet. You ought to consider $250 or $500 at a minimum.

You also ought to be obtaining a motor vehicle report (MVR) from your insurance agent, at your cost, on each of your drivers at least once a year at the beginning of the season. If you have drivers with tickets, accidents or liquor-related violations, you are putting your business at risk. Statistically, such drivers are more likely to have accidents. It doesn’t matter if they got the tickets away from work. Those habits can mean sincere trouble for you and your business.

Commercial auto remains one of your largest exposures to a major lawsuit as a result of your employees. You cannot be too careful.

General liability
General liability remains one of the most important policies.

There is a tremendous amount of confusion about coverages you ought to be carrying. First, you should make sure your agent has included comprehensive general liability to cover all operations that you may be involved in as a landscape contractor. If you do not have comprehensive coverage, certain tasks that you now do occasionally (such as trimming branches) may not be insured.

The comprehensive portion provides coverage for anything that you do as long as it is within the scope of tasks typical to a landscape contractor. The comprehensive general endorsement is normally provided free. It therefore makes no sense not to carry it.

Existing liability
The next critical area covers your existing liability portion. You ought to open your policy to the liability portion and look for Code No. 07311. An X, C or U after the Code No. 07311 means that explosion, collapse and underground are excluded from coverage. There must be a charge showing the deletion of these exclusions in order for these coverages to apply. Unfortunately, many agents do not even understand this. You can forego explosion and collapse, but every landscape contractor should carry underground liability coverage.

Fiber optics are being installed all across the United States. Unlike phone lines, fiber optics cannot be spliced. If you cut a fiber optic cable, the average cost to repair the damage from junction box to junction box, often a half-mile apart, will be about $50,000.

If your present policy shows the “U” after the code number, you have no coverage for such a claim. If you hire a trenching firm to work for you and they do not carry underground liability, you will be responsible whether you carry the coverage or not. Once again: do not put a shovel in the ground unless you have underground liability and it is verified by your agent in writing.

Do not hesitate to accept a $500 or $1,000 deductible for underground if it will mean a rate reduction. Once underground claims begin coming in from the fiber optics mishaps, this important coverage will undoubtedly get more expensive than it now is. You should be calling “Julie” for every project to be staked prior to setting foot on the project.

If a claim does occur, make certain you photograph the actual damage.

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and document the names of the utility company people that visit the accident site. If they mis-marked the site, it is possible to fight the claim. But only if you have documentation.

**Property**

Property coverage should include not only your office contents but your contracting equipment too. In any property coverages, only accept “All Risk” protection which is the broadest coverage you can obtain. Also, take “Replacement Cost” coverage for your property wherever possible. This will eliminate depreciation when the item is damaged or lost.

It may not always be possible to secure Replacement Cost coverage, especially on contractors’ equipment. So be prepared—if you lose a major item—to suffer some economic loss when the adjustor deprecates the item. You ought to be updating the values on your equipment schedule as well as other property at least once a year.

**Liability umbrella**

The final coverage area is known as the liability “umbrella.” This policy is a liability coverage that goes above and beyond your other liability exposures.

Since the rates for this coverage have skyrocketed in the last few years, you might consider taking a minimum of $1 million or even going without, if the cost is too high. Your contracts will demand that you carry higher limits at times, and you typically will be required to purchase one or increase your present policy, depending on the contracts.

Not everyone needs or ought to carry an umbrella policy. There is some degree of truth to the statement, “if you give me a $3 million policy, I’ll show you a $3 million lawsuit every time.” Carrying $600,000 on your underlying policies will be more than sufficient for virtually all contractors.

To offer several suggestions:

- You will usually have your best chance of finding good insurance companies by participating in industry association-oriented insurance program. Those companies will usually stand by you through difficult times when the market is less than pleasant.

Do not be afraid, however, to bid your insurance to other companies every third year or so. That bidding should include other agents since no agent can adequately represent the entire marketplace.

Furthermore, such bidding forces your agent to remain competitive and on top of your account. Traditionally, competition should only make a good agent look better.

- Next, demand that your insurance company provide loss control services to help you reduce exposures and potential claims. Remind them, too, that they have a vested interest in your account being profitable.

- Thirdly, seek out an agent that understands your business and communicates. Have that agent change your expiration date from the spring to later in the year when your cash flow makes it easier to pay the already-high premiums. It makes no sense to have this large expense hitting you in the face as your season begins—when everyone is looking for money. Making such a change is just one example of service your agent should be providing.

Getting involved with your insurance program and knowing more what it includes and excludes will go a long way in improving your insurance coverage.

Remember, “the big print giveth and the small print taketh away.” Get involved. And good luck.

---

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How Fast Is Too Fast?

Yes, you can grow too fast. As a matter of fact, you might be growing too fast right now. Here are some questions you can answer to tell you exactly how fast you're growing.

by Rudd McGary and Ed Wandtke

There is an excitement about having a growing company. That's one of the reasons why many owners point toward growth.

But there are also times when a company should look at consolidating its current position so that the growth to that point is solidified. At times growth—particularly if measured only by revenue—is not the best strategy for a company. The notion that increasing revenue will increase profitability traps many growth companies that fail to look at measurements necessary to ensure profitable growth.

As growth continues, many issues are important to address. Some of the issues are cost-related but are often overlooked due to the company's rapid growth and profitability. Here are some keys:

1. Should you consider growth in profitability as an objective before growth in total revenue? Companies exist to make money, profits. Failure to do so will result in the company going under. For entrepreneurial types, the focus on accountability is not as exciting as growth in revenue. But determining ways that a company can be made more profitable at its current size is more than an exercise...it's a necessity.

We believe that a company should be profitable at any size, with the possible exception of the first year when start-up costs are incurred. Looking at profitability and determining ways to add profits is one way to look at growth.

2. Could any under-used assets add to the company's growth without adding costs? You can look at this question from two vantage points.

First, do you have vehicles or equipment that could be better used to increase sales? Companies sometimes buy an extra vehicle as a sort of insurance policy against down time, but at the same time they might be able to use the same piece productivity.

The same is true with certain pieces of equipment. Companies buy new types of equipment for specific jobs and then find that they have equipment standing around during part of the year.

Second, are your personnel productive enough? If you have a lawn care company and each of your applicators is doing $60,000 per year, you have a lot of potential in revenue from these people. This under-use should be evaluated as much as the equipment and vehicles.

3. Do you have enough management talent to grow? This is often overlooked. The management talent needed to get you to your current size may not be the same type needed for your next growth objectives. This is particularly true in smaller companies, although it extends to larger companies as well.

Who will become managers in the organization? Do you have people internally whom you can promote? Do you have specialists in different areas who can manage them? These and other management questions aren't asked often enough. Generating the revenue for growth is possible—managing the growth is another question.

4. What is the cost, from a marketing point of view, of growth in your marketplace? As your company grows, it will face more severe competition unless you are fortunate enough to be the only company in your area doing what you do. This is rarely the case. The more severe the competition, the more costly the marketing.

Costs increase in advertising, personal sales efforts, promotion and/or management time. You need to be aware of these when determining your desired rate of growth. You may find that projected growth will, in fact, be too costly for you. That means you must rethink your growth objectives.

5. Finally, what financial needs will you have in order to grow? Will you need equipment, personnel, vehicles, operating space? All of these resources will have costs attached to them. How will you fund these? Can they be funded out of retained earnings, will you need to give up equity to raise cash, or will you borrow to finance them? These are the first questions to ask.

Then you need to know, particularly if you have chosen debt funding, whether or not you will be able to fund the debt that you incur. You need to be certain (or, at least as certain as you can be) that the money you spend will indeed attract new business. If you can't be certain of a growth in customers, you shouldn't be spending money simply because you have a "feeling" about the future.

Summary

If you want to grow—and most companies do—you should look at the reality of your present position:

Are there areas that can be more productive without adding additional costs? Does the marketplace really offer the potential for growth that you want? What is the competition likely to do, and what will this cost you? Do you have the management capacity to grow or will you have to either promote or go outside the organization to ensure profitable growth? Is this the year when you should consolidate past gains and wait until next year for major expansion? And, finally, can you afford to grow?

All of these questions show that you need to do a lot of planning before you go through major growth. With this planning, and assuming that the marketplace offers true opportunities for growth, you can grow. Without asking—and answering—these questions, you may be growing too fast. It is a risk that all companies must face.
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MARCH

1-3—Vertebrate Pest Conference. Monterey, CA. Contact: Dr. Terrell P. Salmon, Wildlife Extension, University of California, Davis, CA 95616; (916) 752-6409/2536.


2-3—Michigan Forestry and Parks Association Annual Winter Conference. Michigan State University, East Lansing, MI. Contact: Myrtle Jones, Life Long Education, Kellogg Center, Michigan State University, East Lansing, MI 48824-1022; (517) 353-9407 or Dan Veresh, Dow Gardens, 1018 W. Main St., Midland, MI 48640; (517) 631-2677.

4—ASTM Symposium on Vertebrate Pest Control and Management Materials. Sheraton Hotel, Monterey, CA. Contact: Dr. William Jackson, Environmental Studies Center, Bowling Green State University, Bowling Green, OH 43403.

4-5—South Florida Landscape Trade Show. Miami Expo Center, Miami, FL. Contact: Charlye Roberts, Florida Nurserymen & Growers Association, Dade County Chapter, 19160 N. Krome Ave., Miami, FL 33187; (305) 232-2035.

5-13—1988 New York Flower Show. The Horticultural Society of New York, Pier 90, New York, NY. Contact: David Jacobson, Marketing Services Corp., 811 The Parkway, Mamaroneck, NY 10543; (914) 698-1417 or David Harrington, 128 West 58th St., New York, NY 10019; (212) 757-0915.

6-10—1988 Canadian Turfgrass Conference. Harbour Castle Westin Hotel, Toronto, Ontario, Canada. Contact: Mary Gurney, Canadian Golf Course Superintendents, Weston, Ontario M9N 1X3; (416) 240-7304.

9—Sports Turf Conference. Sports Turf Association-Canada, Hilton Harbour Castle Hotel, Toronto, Canada. Contact: Annette Anderson, Horticulture Department, University of Guelph, Guelph, Ontario, Canada N1G 2W1; (519) 824-4120 ext. 2597.

9-10—GreenShow '88. Del Mar Race Track, San Diego, CA. Contact: Andy Mauro, GreenShow '88, Del Mar Fairgrounds, Del Mar, CA 92024; (619) 755-1161.


10—Commercial Landscape Maintenance Short Course. Agricultural Center Auditorium, Sanford, FL. Contact: Uday Yadav, Agricultural Center, 250 W. County Home Rd., Sanford, FL 32773; (305) 323-2500.


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Entry forms are now being accepted by the Professional Grounds Management Society and Landscape Management magazine for their second annual "Landscape Manager of the Year" award.

Purpose of the award is to recognize superior job performance among landscape managers, to challenge those involved in the industry to achieve higher standards of excellence, and to bring national recognition to deserving managers.

Any person directly responsible for the professional maintenance of one or more landscapes is eligible to enter. Applicants will be judged according to job performance, honors and awards, procedures and philosophies, and contributions to the green industry. Applicants will be asked, at the time of entry, to submit four 5 x 7 black-and-white glossy photos and 10 color 35mm slides of current work areas with a short narrative on each.

applicant's name
Title

Applicant's company

Official entry form should be sent to:

Name
Title

Company

Address City/State Zip Code

Mail to: PGMS, Landscape Manager of the Year, 1201 Galloway Ave., Suite 1E, Cockeysville, MD 21030
Iron for turf

**Problem:** Is there any real advantage in using iron on turfgrass? If so, what would be the proper timing and amounts? (Pennsylvania)

**Solution:** Depending upon the soil properties, turfgrass species and geographic locations, there may be some advantage in using iron on turfgrass. Reports indicate that iron can improve the color and can possibly reduce the need for using high rates of nitrogen. There are a number of iron-containing products on the market. The product literature may suggest using iron three to four times a year to get maximum benefit.

Unpublished reports suggest that the results obtained from iron-containing products are quite variable. Some have had more success than others. Non-chelated iron products appear to be better than the chelated products. We have not seen any appreciable color difference over untreated Kentucky blue, rye and fescue mix turfgrass using several iron products on the market, even after applying four times a year. Some iron sources can be phytotoxic and a few can stain non-targeted areas.

So, as far as your question concerning "real advantages," the best thing to do is to try different products on a small scale in your area. Read and follow label specifications for details on rates, etc.

Needle-dropping spruces

**Problem:** Spruce plants in our area are showing severe dieback and needle drop from lower branches. The problem appears to be progressing from the lower branches upwards. We thought that it might be Cytospora canker, but there is no bluish white pitching. We sprayed for mites and spruce gall aphids without much luck with this needle problem. Any idea what this problem might be and how do we manage it? (Pennsylvania)

**Solution:** Based on your description of the symptoms, the problem appears to be most likely related to fungal disease. Probably it is not Cytospora because you have not seen the bluish white resinous pitching on the trunk or branches which is typical of Cytospora canker disease.

Needlecast fungal disease caused by Rhi- zosphaera kalkhoffii appears to be the next best possibility. This disease is known to progress from the lower branches upward. Infected two-year-old needles drop usually in the second summer. Current-year needles may become infected in May/June months but symptoms don’t occur until fall or next spring. At this time, the fungus produces small black fruiting bodies on the surface of needles—almost in a row—near the stomata. Healthy needles will have whitish stomatal opening. Infected two-year-old needles turn yellow in July and then change to purple by late August-early September and finally drop by late summer or fall.

Check the needles periodically for fruiting bodies of this fungus. Plant disease-free trees. Send in fresh representative samples to your county extension agents and verify the possibility of Rhizosphaera kalkhoffii before using fungicides. Application of benomyl, Daconil or Bordeaux mixtures when new growth begins or around early June and repeated again in late June is recommended to manage this disease. Continue the pest management you were providing thus far. Fertilization and watering as needed will improve plant vitality and maintains plant health.

Soil compaction and trees

**Problem:** Older trees on the town commons are suffering from years of soil compaction. How can we help these trees recover? (Massachusetts)

**Solution:** Soil compaction is one of the major problems in heavy traffic areas like school grounds. There are only a few things that can be done to relieve compaction.

Where practical, try to correct compaction with hydraulic pressure. Soil-injecting root-feeding tools can be used. The key is to get the water pressure deep into the root zone to break the compacted soil. In most situations, the active roots of plants will be in the top 18 to 24 inches.

Another approach is to drill vertical holes in the ground using a soil auger and filling them with loose amendments like mulch or peat moss. If poor drainage appears to be a problem, filling these holes with pea gravel would be useful.

The most ideal way to handle these problems is to recognize the potential for compaction from traffic or construction, fill damage, etc. prior to its happening. Then, start providing corrective measures and treatments before the anticipated compaction occurs.

In situations dealing with fills or construction, installing dry wells around valuable trees is beneficial. Make sure to allow enough room for the tree trunk to grow. For the problems you are currently experiencing, apply water pressure using root-feeding injecting needles and/or the auger drilling method for the most practical solution. If practical, use a mulch over heavily-trafficked areas to minimize compaction.

Balakrishna Rao is Director of Lawn Care Technical Resources for The Davey Tree Co., Kent, Ohio.

Questions should be mailed to Problem Management, Landscape Management, 7500 Old Oak Boulevard, Cleveland, OH 44130. Please allow 2-3 months for an answer to appear in the magazine.
Offensive advertising

To the editors:
I am a landscape contractor in Richmond, Va. and I also ride a Harley-Davidson motorcycle. I found the Scotts Pro-Turf advertisement printed in LANDSCAPE MANAGEMENT magazine (November 1987, page 28) to be discriminatory towards those of us who ride motorcycles. I do not feel that "the average person" considers a motorcycle rider "Big Trouble." This negative and prejudiced depiction of motorcyclists is unnecessary and harmful to all motorcycle riders.

Many motocycle organizations contribute to charities, hold toy runs for children's hospitals, and are trying to change the public view that has been partially created through advertising such as this.

David Wilson
Shipp & Wilson Landscaping
Glen Allen, Va.

Where are the people?

To the editors:
I enjoyed your November "Outlook" column (Where are the people?). You probably opened some eyes to the problems facing the industry via-vis future leadership.

Richard W. Lambert
The Idea Bank
Tempe, Az.

Cool suits for hot work

To the editors:
As a long-time subscriber to your magazine, I particularly enjoy the columns in which questions and inquiries are posed by your readers and responses provided by the staff. I am reasonably sure the sales and manufacturing community likewise takes great interest in these columns. I would like to pose a challenge to equipment manufacturers on behalf of the many thousands of people employed in our kind of work.

I am the parks director in the mid-Atlantic community of Hampton, Va. Among our many responsibilities is turf maintenance of all highway rights-of-ways, median strips, vacant lots, school grounds, parks, public buildings and so on. Our weather in June, July, August and September gets very hot and miserably humid. The fatigue factor affects our employees tremendously under these conditions.

In the past year, stock car drivers on the Winston Cup circuit have taken to wearing what they refer to as "cool suits" and helmets. These are freon-charged and operate via hook-ups to a small compressor and electric motor. Recently I read where the average cost per suit is about $2,800 and helmets run in the vicinity of $400-$600.

Why wouldn't it be possible for cool suits to be manufactured for use by landscape employees? A conservative estimate of the number of tractor operators or riding mower operators employed by highway departments, cities and parks departments, golf courses and so on would probably be in the 50,000 to 100,000 range, not to mention private companies. Given the economics of scale, it would seem likely to me the manufacturers of such wearing apparel could bring the price down into the range which could be considered by this industry as an item of clothing which could be placed on the employees to improve productivity, morale, employee health, etc. In the case of tractors and riding mowers, it would seem the necessary attachments for access to electricity and on-board compressors could become an optional or standard item.

In the interest of the landscape employee of the present and future, I would request the industry take serious consideration to the suggestion.

Thomas H. Daniel
City of Hampton
Hampton, Va.

Wrongo

To the editor:
Thanks for the press given to me in your September issue.
The 15 years of service for which I was given a plaque at the Lawn Seed Division meeting during the annual convention of the American Seed Trade Association was as secretary-treasurer of The Lawn Institute. It was not as the Lawn Seed Division's secretary-treasurer, as reported.

Robert A. Russell
J&L Adikes, Inc.
Jamaica, N.Y.

Oops! Our apologies.—Ed.
Perennial ryegrass gets PVP certificate
Pickseed West recently announced that the USDA Plant Variety Protection Office has issued a PVP certificate for Fiesta II perennial ryegrass. The application was processed and protection granted for Fiesta II in record time.

According to Pickseed's Jerry Pepin, Ph.D., Fiesta II represents the latest and best efforts in variety development to date. It is a dark green colored, fine-leaved variety that has a lower and slower growth habit than most perennial ryegrasses and is less stemmy in the spring.

It has excellent heat tolerance and summer performance. Circle No. 197 on Reader Inquiry Card

‘Bandage'-type wrap protects young trees
Guard-Tex Tree-Wrap provides excellent protection for newly-planted trees and bushes from the elements, dogs, rabbits, mice and other gnawing animals, according to its manufacturer.

Easy to apply, self-adhesive Tree-Wrap protects tender bark against splitting, sun scald and freezing temperatures while allowing the bark to breathe, General Bandages says. Tree-Wrap is also easy to remove, and because it sticks only to itself, it will not strip tender bark or leave a gummy residue.

Landscape managers and nurserymen can also use Tree-Wrap for grafting operations, staking tomatoes and training vining vegetables, roses, espaliered trees and shrubs. Circle No. 198 on Reader Inquiry Card

Pesticide add-in eliminates odors
One pint of Mask-It in 1,000 gallons of spray mix converts a pesticide odor into a pleasant fragrance.

An unpleasant odor is translated in the public's mind to be toxic vapors of hazardous chemicals, Rockland Chemical Co. claims. No longer do the majority of lawn care clients believe that the pesticide's efficacy is proportional to its odor, says Rockland. They are more concerned about possible health hazards and neighborhood annoyance, the company adds.

Mask-It helps solve all of these consumer concerns by eliminating the unpleasant odor associated with pesticide applications. Circle No. 199 on Reader Inquiry Card

Granular herbicide now labelled for ornamentals
A new long-lasting granular weed...
control product containing Surflan is now available for ornamentals.

XL, from Elanco Products, is registered for use on container-grown ornamentals, landscape ornamentals and ground covers.

XL is widely used as a pre-emergence herbicide in warm-season turf for control of most annual grasses and certain broadleaf weeds. When used on ornamentals, XL controls a broad spectrum of weeds for up to eight months, depending on rate.

XL is surface-applied over established plantings, requiring only rainfall or irrigation to move the herbicide into the soil. One- to two-inch cultivation will not reduce its effectiveness.

Computer provides tree management help

A group of information-related services, including computer training, is being offered by ACRT, Inc.

The "Tree Manager" package includes tree inventory, a management plan, computer software and software installation, training and support. This management information system ensures the most dangerous tree situations are attended to first. Then, all trees are placed on a routine schedule which can be budgeted on a yearly basis.

Tree Manager software generates listings of sites and trees that meet a user-specified condition, listings of inspections to be completed, work orders and summary reports.

Interlocking pavers cut down on maintenance

Extreme temperatures won't hurt Uni Interlocking Concrete Paving Stones. Attractive and durable, the pavers fit into residential or commercial landscapes. The paving stones are available in a variety of shapes or colors. They are maintenance-free and can be easily removed for changes in the landscape or underground repairs.

Fine particle fertilizer has pre-emergence action

O.M. Scott & Sons now has an all-soluble, fertilizer-based pendimethalin product 20-5-5 Fertilizer Plus Pre-Emergent Weed Control at a low price.

While maintaining good spreadability, this new formulation contains about four times more particles per square inch than typical blends to greatly enhance coverage and pre-emergence control performance, the company says.

Applied within the flexible rate range stated on the label, the new Scotts product delivers 1.5 lbs. of pendimethalin per acre at 0.6 lbs. of nitrogen per 1,000 sq. ft. This allows users to apply higher rates of active ingredient in areas of heavy weed pressure, without applying too much nitrogen at the same time.

Hahn has an Aerifier® to fit your Tractor... and your Budget.

For fast, easy and economical aerification... and they're practically maintenance free.

Interlocking pavers cut down on maintenance

Extreme temperatures won't hurt Uni Interlocking Concrete Paving Stones. Attractive and durable, the pavers fit into residential or commercial landscapes. The paving stones are available in a variety of shapes or colors. They are maintenance-free and can be easily removed for changes in the landscape or underground repairs.

Circle No. 202 on Reader Inquiry Card

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Circle No. 203 on Reader Inquiry Card
BUSINESS OPPORTUNITIES

WANT TO BUY OR SELL a golf course? Exclusively golf course transactions and appraisals. Ask for our catalog. McKay Golf and Country Club Properties, 15485 N. East Street, Lansing, Michigan 48906. Phone (517) 484-7726. TF.


HELP WANTED

LANDSCAPE MAINTENANCE SUPERVISOR: Scapes, Inc., a commercial landscape firm in Atlanta, Georgia, is seeking an individual who has strong management skills, as well as, extensive landscaping experience and knowledge of plants. Advancement potential — up to Division Manager makes this position ideal for a goal oriented individual. 404-956-7500.

LANDSCAPE DESIGN & SALES: Leading Kansas City landscape company has immediate opening for a talented, experienced and aggressive person in residential and light commercial design and sales. Position requires B.S. in Agronomy or a related field or at least 2 years field experience. Generous wage & benefits package. Send resume to Hunt & Hulteen, Inc., 50 Spark Street, Brockton, MA 02402. (1-617-580-1062). 3/88

MANAGEMENT TRAINEE: Tampa area commercial landscape management firm has opening for person with horticulture degree. Must have knowledge of Florida plants and have the ability to communicate. Initial responsibilities include horticultural quality control and customer service. No experience required. Positive professional attitude and willingness to learn a must. Call Mr. Blanchard 813-854-2383.

The Chicago area Toro distributor is seeking a sales person for residential and commercial turf irrigation. Experience in irrigation design, product application assistance, field service support and project quotations is preferred. Company training and support available. Direct customer involvement also includes training schools and trade association activities. If you have a track record in industrial sales and the landscape industry, please contact Ron Jones, C.T.L., 911 Hilltop Drive, Itasca, IL 60143.

San Francisco Bay Area landscape firm seeks individual with strong horticultural, construction, irrigation, and client relation skills for landscape installation foreman position. Learning and growth opportunities with established company. Competitive compensation and benefits. Letter and/or resume to Landscape Care Company, 4026 Pacheco Boulevard, Martinez, CA 94552.


LAWN CARE PROFESSIONAL: Commercial landscape firm looking for responsible person to start up lawn care division. Responsibilities include applications, service calls, record keeping, training and inventory. B.S. in Agronomy or a related field or at least 2 years field experience. Generous wage & benefits package. Send resume to Hunt & Hulteen, Inc., 50 Spark Street, Brockton, MA 02402. (1-617-580-1062). 3/88

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**HELP WANTED**

Opportunity for Lawn Care Professional in fast growing quality minded company in Eastern Long Island. Excellent earning potential. Experience in sales, agronomy, and turf management is a must. Write to LM Box 441. 2/88

ASSISTANT MANAGER/FOREMEN - Expanding sales, agronomy, and turf management a must. Experienced foremen for maintenance and construction divisions. Associate horticulture degree plus 2 years experience desirable. Excellent compensation package, advancement and career opportunities for goal oriented individuals. Submit letter of application, resume and salary history (in confidence) to: Eastern Land Management, 433 West Main Street, Stamford, CT 06902. 2/88

$1,000,000.00 SALES PERSON - Our top producing landscape salesperson sold $1.6 million during 1987. We're looking for a challenger, a motivated and overachieving landscape salesperson with a proven track record. If you are looking for top wages, an opportunity to excel, and your background includes sales of quality landscapes and developing client loyalty, call today and accept the challenge. Our 16 year young, award-winning Design/Build firm services residential and commercial clients in the booming Cleveland, Ohio market area. Call 216-357-8400. 5/88

LANDSCAPE MAINTENANCE FOREMAN

We want someone who is the "Felix Unger" of lawn maintenance. In short, someone who is meticulous, neat and organized to head up our maintenance crews. We want professionals who take pride in their workmanship. Terrific benefit package and incentive program. Forward resume and salary history to: Green Carpet Landscaping 161 Washington St. Worcester, MA 01610 or call 617-791-3704 2/88

OPERATIONS MANAGER to organize and coordinate 8-9 construction crews daily for large commercial landscape contractor located north of Boston. Must have minimum 5-6 years landscape construction experience, be an aggressive, organized, people-oriented person with applicable educational background. Excellent salary and benefits. Send resume with salary requirements to: J. P. Fisher & Co., Inc., 219 R South Main Street, Middletown, MA 01949. 2/88

LANDSCAPE DESIGNER AND ESTIMATOR. Design/build landscape construction firm is seeking an experienced designer and estimator. Must be able to handle the job from sales to completion of job. Must have good graphic ability. Salary and benefits commensurate with ability and experience. Send resume to: P.O. Box 725, Utica, MI 48087. 2/88

PRODUCTION/SALES/MANAGEMENT - Aggressive Texas full-service landscape firm now accepting resumes for entry level positions in sales, production and management. Excellent opportunities for career, growth oriented persons. Send full resume to LM Box 443. 4/88

SAN FRANCISCO BAY AREA landscape management company has openings for Branch Manager, Supervisors, and Sales Positions in east and north bay areas. Must have demonstrated experience in client and employee relations, self-motivated and have strong horticultural background. Outstanding compensation and benefits to right individual. Send resume and salary history: Grounds Management, Box 269, 324 Main Street, Norwalk, Connecticut 06851. 2/88

SALES MANAGER - A very aggressive person currently active as sales manager is needed to develop sales for an established and progressive (design/build) landscape firm located in the Chicago western suburbs firm. This person will work closely with a principal of the firm and eventually take over the top management position of vice president in charge of sales. Good salary. Compensation package tied to performance. Equity/ownership possible for the right person. We are interested in only experienced highly motivated professional individuals. Send resume to LM Box 447. 3/88

PROFESSIONALS:
Foreman And Asst. Foreman

Grow with an exciting, innovative and expanding firm. We're ranked in the "top 50" in America. Come talk to us and build a rewarding career with New England's best. We are searching for experts in site layout, planting, sodding, tie work, brick/bluestone paving and irrigation. Strong customer relations a plus. We offer great benefits, vacation, incentive and division administrative potential for the management oriented. Forward your resume with salary history to:

Green Carpet Landscaping 161 Washington St. Worcester, MA 01610 or call 617-791-3704

**Does Your Power Mukher Go Ine Distance?**

Reinco

Circle No. 150 on Reader Inquiry Card

FEBRUARY 1988/LANDSCAPE MANAGEMENT 93
HELP WANTED


LANDSCAPE SUPERVISOR. Well-established landscape contractor has immediate opening available in the construction division. Must have either landscape or construction industry experience and have a class "C" license for truck driving. We offer motivated individuals an opportunity to grow with a company with a strong future and many benefits. Amlings Landscape Co., (312) 850-5096. 2/88

Help Wanted—Grounds management supervisor—AWARD WINNING CORPORATION is seeking grounds management supervisor. Must be "intelligent" and self-motivated with a minimum of 2 years "hands-on" supervisory experience. Must be able to schedule, train and motivate crews of 9-12 in all phases of grounds care. Horticultural degree and pesticide license beneficial. Send resume with salary requirements to A&R Landscaping, 500 Tidewater Drive, Norfolk, VA 23504. 2/88

WINNERS ONLY: If you love the lawn care business, and are still looking for your personal security and comfort levels, send us your resume. Your experience should be in all phases of lawn care, management, customer sales and service. We are expanding our operations and will offer the right individual a unique once in a lifetime opportunity. When you prove your abilities, we'll guarantee your success. Send your confidential resume to: P.O. Box 5677, Rockville, MD 20855. 2/88

LANDSCAPE MANAGEMENT MANAGER: Leading Kansas City landscape company has immediate opening for talented, experienced and aggressive person to manage and develop our maintenance and chemical division. Excellent growth opportunity. B.S. in horticulture or related field preferred. Salary incentive, benefits. Send resume with experience and salary history to: Hermes Company, P.O. Box 14336, Lenexa, KS 66215. 913-888-2413. 3/88

Southwest's finest landscape management company seeking enthusiastic, motivated individual for Landscape Maintenance Supervisor's position. Must have Supervisor's ability and minimum 2 years experience in maintenance and/or installation. Agricultural related background or degree helpful. Send resume/work history to: Personnel Director, Maintain, Inc., 2549 Southwell, Dallas, TX 75229. 2/88

LARGE MIDWESTERN DESIGN/BUILD LANDSCAPE CONTRACTING FIRM IS SEEKING:

CONSTRUCTION FOREMEN: No less than 3-5 years experience, must be well motivated and able to motivate others, direct projects from beginning to end. Blue print reading and plant knowledge a must. Willingness to work hard and produce can lead to advancement.

FIELD OPERATIONS SUPERINTENDENT: Responsible for the coordination of 8-10 landscape construction crews. Must be well organized. Excellent supervisory skills. Have ability to communicate with clients and general contractors. Must be a self-starter, highly motivated and goal oriented individual. Salary and benefits commensurate with ability and experience. Send resume to: P.O. Box 725 Utica, MI 48087

"It cuts big jobs down to size!"

"We were impressed with other stringtrimmer/brushcutters until we tried THE GREEN MACHINE® Model 3000SS. Now we know the others just can't compare. We cut briars an inch in diameter with this stringtrimmer, then switch to the blade for anything up to three inches. "It's one heck of a unit. We put 30-35 hours a week on it for four years and there's just as much compression as when it was new. It's tough! "Now we're looking forward to the new technology of The Panther series so we can tackle even more jobs."

—Anna & David Cook, Green Thumb Gardening, Crescent City, Calif.

Introducing The Panther. Another great Expand-It® System from THE GREEN MACHINE®, designed especially for the professional landscaper.

Stringtrimmer/Brushcutter

• 24.1 cc commercial engine with 1.3 horsepower
• All position state of the art carburetor
• Anti-vibration harness
• Patented Tap-For-Cord® string release
• Brush and saw blade capabilities
• Interchangeable with 3 other yard care tools

The Green Machine®

HMC, P.O. Box 560, Long Beach, CA 90801-0560 20710 So. Alameda St., Long Beach, CA 90810

Circle No. 121 on Reader Inquiry Card

LANDSCAPE MANAGEMENT FEBRUARY 1988
HELP WANTED: Landscape, turf and spray foremen, nurserymen and pruners. Experience and/or education necessary to work for our dynamic, quality oriented, large, 40 year established company in the Hamptons on Long Island. Professional wages and benefits, year round, full time positions. Contact: Whitmore-Worsley Inc., P.O. Box 10, Amagansett, NY 11930. (516) 267-3756.

LANDSCAPE CONSTRUCTION FOREMAN. Experienced persons needed to lead our construction crews. A thorough knowledge in sodding, planting, R/R tie work, and walk/patio construction are required. Come grow with this progressive landscape corporation. Send resume and salary history to: D.J. Murphy Landscape Co., Inc., P.O. Box 3079, Framingham, MA 01701.

PROTURF TECHNICAL REP

Scotts ProTurf Division currently has a ProTurf Tech Rep opportunity available within its national sales force.

Tech Reps are responsible for the sale, promotion, and servicing of Scotts commercial ProTurf products to those professionals responsible for the management of large turf areas such as golf courses and college campuses. Tech Reps specialize in product knowledge and agronomic expertise to recommend and sell the Scotts ProTurf product line. Territory sales responsibilities can range from 100 or more golf course accounts contained within a geographical territory.

The ideal candidate will have a college degree in turf management or agronomic science and turf related job experience.

Scotts offers an excellent starting salary plus incentive, company car, and a comprehensive benefit program including profit sharing. Interested candidates should send a resume with current salary level in confidence to: Corporate Human Resources, O.M. Scott & Sons Company, 1411 Scottslawn Road, Marysville, Ohio 43041.

PROTURF PRODUCTION TECHNICIAN

The Scotts ProTurf Division currently has a ProTurf Production Technician opportunity available within its national sales force.

Tech Reps are responsible for the sale, promotion, and servicing of Scotts commercial ProTurf products to those professionals responsible for the management of large turf areas such as golf courses and college campuses. Tech Reps specialize in product knowledge and agronomic expertise to recommend and sell the Scotts ProTurf product line. Territory sales responsibilities can range from 100 or more golf course accounts contained within a geographical territory.

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MANAGEMENT: Ever-Green Lawns Corporation, a division of the multi-national Hawley Group, Ltd., is looking for experienced lawn and tree care professionals. Please respond in writing only to Richard D. Niemann, Corporate Recruiter, Ever-Green Professionals, 1390 Charlestown Industrial Drive, St. Charles, MO 63303. TF

IRRIGATION DESIGNER/SALESMAN FOR LANDSCAPE CONTRACTING FIRM IN WEST CENTRAL FLORIDA, THE FASTEST GROWING AREA IN THE NATION. Must be experienced in all aspects of irrigation design and installation for commercial and residential properties. SEND RESUME TO: MANAGER, P.O. BOX 1471, BROOKSVILLE, FL 34605-1471.

WANTED - Aggressive Manufacturer's Reps - Manufacturer of agricultural, golf course, municipal and lawn & garden spraying equipment is seeking qualified reps with experience in sprayer sales. Seeking nationwide network, exclusive territory contract, excellent technical support and top of the line equipment. Send resume and current line card to: The Broyhill Company, P.O. Box 475-CB, Dakota City, NE 68731-0475. Phone: 1-800-228-1003.

CAREER OPPORTUNITIES

ORKIN LAWN CARE (a division of Rollins, Inc.), is one of the nation's largest and fastest growing Lawn Care Companies. With over 43 branches located in 12 states our expansion plans for FY88 will require more proven management.

We are looking for Branch, District and Region Management talent, as well as, Sales and Service Management employees.

If you are ready to join an aggressive company with over 87 years of service business experience, one that is stable, growing and one where you can build a strong career with unlimited advancement opportunities then send your resume TODAY or call 404-888-2771.

Personnel Director
Orkin Lawn Care Division
P.O. Box 647
Atlanta, GA 30301

Circle No. 122 on Reader Inquiry Card

FEBRUARY 1988/LANDSCAPE MANAGEMENT 95
Expanding your business is our business!

Introducing The Panther, another great Expand It® System from THE GREEN MACHINE® that landscapers have come to trust for performance, durability, and serviceability.

Now, you have the four most needed tools in one efficient system. Here are your Stringtrimmer/Brushcutter, Edger, Weeder/Cultivator, and Blower — all available to you with a single twist of a single knob on the easy-to-hold, well balanced, and lightweight shaft.

Plus, this patented coupling system permits you to disassemble your equipment and securely lock it in the cab of your truck.

Professionals are getting expanded use and expanded profits by going with The Panther — the Expand-It® System with the power, reliability, and versatility you need season after season, year after year.

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20710 S. Alameda St., Long Beach, CA 90810

Circle No. 123 on Reader Inquiry Card
FOR SALE

Bucket Trucks, Tree Spade, Chippers, Stump Grinders, all makes and sizes. Check with us for the best deal going! Equipment in your area. We’re Brokers. American Equipment Sales 314-789-3576. 24 Hours. TF


BOWIE HYDRO-MULCHERS AND STRAW BLOWERS, New and used. Landscape Supply, Ltd., P.O. Box 22092, Greensboro, NC 27420. (919) 292-2922. 3/88

THE AFFORDABLE STUMP CUTTER: Stainless Steel. HEAT TREATED, 5W lbs., FAST, SAFE cutting. Unique locking system holds 6 grooved carbide teeth removed with one recessed bolt. Compatible with new or old two wheel Gravely Tractors. Kinetic Stump Cutter Inc., 1220 W. Havie St., Jupiter, FL 33458 or (305)744-0680 after 5 p.m. EST. 3/88

CUSTOM LANDSCAPING TRAILERS. Protect your investment from exposure and theft. Choice of colors, delivery available. NORTHEAST TRAILERS, Palatine, IL 60067. 847-923-2130. TF

FOR SALE 1984 to 1986 Chevrolet C-60 s with V8, $16,800 to $21,900. Call Jim, (314) 928-3727. 2/88

HANNAY REELS: New in the box, E1525s and E1530s, $339.00. Lawn spray hose 275 psi and 600 psi, all sizes. Original Imler measuring wheels, $48.00. Glycerin filled gauges 0-60 psi, 2-02100 psi, $19.95. Polypropylene ball valves 1/4" to 2" Chemlawn guns $75.95. Lawn spray boots $16.95. Lawn spray gloves $1.25/pr. Call Herch's Chemical Inc., 1-800-843-LAWN outside of Michigan or 1-313-543-2200. TF

LEAVING country, need to sell. 1979 Brouwer Sod Harvester in excellent condition. 72" cut x 18" wide, brush attachment, rubber mat, roof lights, cover roof. Mounted on 3600 Ford Diesel with oil cooler. 1,293 hours. Contact Kenneth Mach, Rt. 3 Box 109, Yukon, Okla. 73099. 405-354-3989. 3/88

BRUSH CHIPPER - Mitts Merrill, 12 inch cutter head, 300 cu. in. 6 cylinder Ford engine. Excellent condition. Iowa City, IA (319) 354-3087. 2/88

ATTENTION GOLF COURSE SUPERINTENDENTS: Great Meyer Zoysia for your Fairways and Tees. Guaranteed Bermuda free. Beauty Lawn Zoysia (Cincinnati) 1-513-424-2052. 2/88

1977 Skyworker 1045A mounted on 1977 Ford F600 complete with chip and tool boxes, cab protector. $17,900.00. Toledo, Ohio (419) 865-7071. 2/88

BOWIE HYDRO-MULCHERS AND STRAW BLOWERS, New and used. Landscape Supply, Ltd., P.O. Box 22092, Greensboro, NC 27420. (919) 292-2922. 3/88

FREE CATALOG
CAUTION PESTICIDE APPLICATION
FOR SALE 1984 to 1986 Chevrolet C-60 s with V8, 5-speed, 2-speed or auto transmission. Most have four wheel disc brakes, tinted glass, AM radio, undercoated and rustproofed, with 1000 to 1200 gal. stainless or fiberglass tanks. 100 gal. saddle tank, dual reels, Hydro cell or Bean 2020 pump, 5-speed, 2-speed or auto transmission. Most have

YOU’LL BE amazed at the profit you can make by using the tough, big EL 71 Tiller from Kuhn in your commercial operation. The EL 71 is the top of the line Tiller that will work for you... sun up to sundown! When making your living depends on your equipment, look to Kuhn’s complete line of tillers... and put more money in your till!

THE KUHN CONNECTION
Town & country tools for over 160 years
Kuhn Farm Machinery, Inc. P.O. Box 224 Vernon, NY 13476 315-625-2620

Circle No. 130 on Reader Inquiry Card
FEBRUARY 1988/LANDSCAPE MANAGEMENT 97
Ungalvanized Wire Baskets and Burlap Liners for tree spades and hand dug made by Colorado Wire Products, 9432 Motsenbocker Road, Parker, CO 80134. 303/841-3354. TF

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


SPRAY TRUCK: 1979 International S1700, 1150 gallon tank with 2 reels and hose, Bean 20 pump, excellent condition, new paint, production ready, $7,500. Call 816-229-5051 Steve or John. 2/88


WANTED

WANTED TO BUY—2000 gallon or larger Hydroseeder. 30" Tree Spade Loader Mount. 743 or 843 Bobcats. Call 216-357-8400 or write EQUIPMENT, 1447 N. Ridge Rd., Painesville, OH 44077 for photos. 4/88

WANTED: Sprayable Team distributors in select areas. Please call 1-800-225-2639. 2/88

WANTED: Large Lindig and Royer Shredders. Lewis Equipment, 320 Third Street S.W., Winter Haven, FL 33880. (813) 294-5893. 10/88

WANTED: Sprayable Team users. Please call for rates. 1-800-225-2639. 2/88


NEW AND USED EQUIPMENT—Asplundh, Hi Ranger and Lift-all forestry bucket trucks, Chipmore wood chippers. Mirk, Inc., (216) 669-3567, (216) 669-3562, 7629 Chippewa Road, Orrville, Ohio 44687. TF

BUCKET TRUCKS, Straight Stick, Corner Mount and Knuckle Boom Cranes. Brush Chippers - New Morbark Disc Type, New Woodchuck Drum Type. Best prices anywhere. Used Chippers - Asplundh, Woodchuck, etc. 2 to 8 usually in stock. Sprayers, Dumps, Stakes, Log Loaders, Crew Cab Chip Box Dumps, Railroad Trucks, 50 in stock. Sold as is or reconditioned. Opdyke’s, Hatfield (Philadelphia Area) 215-721-4444.

AUCTIONS

AUCTION RESULTS ARE IN: Send self-addressed stamped envelope for prices attained. THANK YOU to Illinois Landscape Contractors Association, Shemin Nurseries, Consigners, Buyers, Attendees. HAMILTON AUCTION COMPANY, Professional Landscape Auctioneers, 228 Main Avenue, Clinton, IA 52732. (319) 243-1252. 2/88

BRIDGING SOLUTIONS

Our in-house engineering staff is ready to help you solve your bridging problems.

You name it, pedestrian, vehicular, pipe support, conveyor system, if it involves a bridge—we can do it!

Custom engineered, prefabricated and delivered to your job site.

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Goossen Bale Chopper

The Goossen Bale Chopper is a proven landscaping machine. One or two operators lay down an even layer of mulch on newly seeded lawns of any size (the Bale Chopper is easy to maneuver in even the smallest residential applications). The even coverage, WITHOUT tearing and spreading bales by hand, means better moisture retention, better germination. Complete with interchangeable hose and directional spout available on both self-powered (gas engine) and tractor-mounted PTO models.

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FEBRUARY 1988/LANDSCAPE MANAGEMENT 99
Reincarnating the spirit of grass

They were the 21 pages that shook the world—the athletic turf world, anyway. "The Tyranny of Phony Fields," Sports Illustrated, August 12, 1985, was one of the first in-depth views of artificial vs. natural athletic fields presented to the general public. Those pages echoed the pain of paralyzed players; talked technically about the turf; and even satirized the issue amidst the hard facts.

One cartoon which sticks in my mind shows a baseball player crying at a headstone. The marker reads, "HERE LIES/GRASS/DIED/MARCH 19, 1966." On that date, Houston installed the first Astroturf field in its dome stadium.

But with the new year comes a new vision for such a cartoon: a spirit rising from the grave with the caption reading, "GRASS/REINCARNATED/1988." This has nothing to do with the new age—Shirley MacLaine openness to reincarnation. Instead, it signals a new age in athletic turf.

During the last month, I received two phone calls: one from a sports reporter in Boulder, Colo.; the other from a Patriots fan in Foxboro, Mass. Both wanted reprints of LANDSCAPE MANAGEMENT's articles "Sidelined" and "Hard Knocks" on athletic field safety. Both are waging campaigns against artificial turf. Kelly Lyle, the sports writer, wants the University of Colorado to replace its synthetic turf with grass. Debbie DeSantis, the fan, wants Sullivan Stadium to go with natural turf. Lyle's print campaign has, in fact, stalled the decision of the university, until the economics of going with grass can be reviewed. DeSantis, who is concerned for the safety of the players, is just getting her campaign off the ground.

Athletic turf managers on all levels need to take fans, parents and media more seriously. After all, it was a fan, Rose Marie Branson, who, along with the support of the Toronto Star, got Toronto to at least consider putting natural turf in the city's new dome. (The stadium commission decided against it.)

This is not just an arbitrary issue which gives fans and sports writers something to talk about. It's one that's important to the athletes as well. Soldier Field in Chicago will return to grass this year, at the request of the Bears. "The injuries to (former Bears cornerbacks) Les Frazier and (wide receiver) Dennis McKinnon were directly related to (artificial) turf," Robert Mier, the late Mayor Harold Washington's stadium advisor, told the Chicago Sun-Times.

Finally, key people are recognizing the advantages of natural turf. 1988 is not just a new year, but the beginning of a new age: the reincarnation of the spirit of grass.
Golf tips from Yamaha.

1. Invest in the right equipment. The Yamaha Terrapro PTO is more versatile than any utility vehicle west of Pebble Beach. And it costs less.

2. Our Woods-designed rough-cut mower keeps the rough just rough enough. Use the finish mower for delicate maneuvers around the green.

3. Our 50 and 100 gallon boom sprayers from Broyhill are fast and efficient. Use one for herbicides, one for pesticides and the grass will always be greener.

4. The rear-mounted, 2000 rpm PTO (Power Take Off) lets you do all of the above.

5. Our optional turf tires, specially designed for the Terrapro, are even gentler on your turf.

6. Switch to our handy hand-held sprayer in tight spots.

Time saving tip: When you're not mowing or spraying, use the Terrapro to get quickly from one part of the course to another. (To prevent unseemly hot rodding by your crew, lock the dual-range transmission in low.)

Optional tip: Attach our optional Hydraulic Power Unit to the PTO for aerators, post hole augers, hydraulic rakes and the like.

Final tip: Call 1-800-331-6060, ext. 685, for your nearest dealer.

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Jamestown establishes quickly and puts the greens into play faster. It will perform as a companion grass for up to 10 years as the bentgrass matures and gradually dominates the turf.

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