LAWN AND LANDSCAPE
ALA MAINTENANCE
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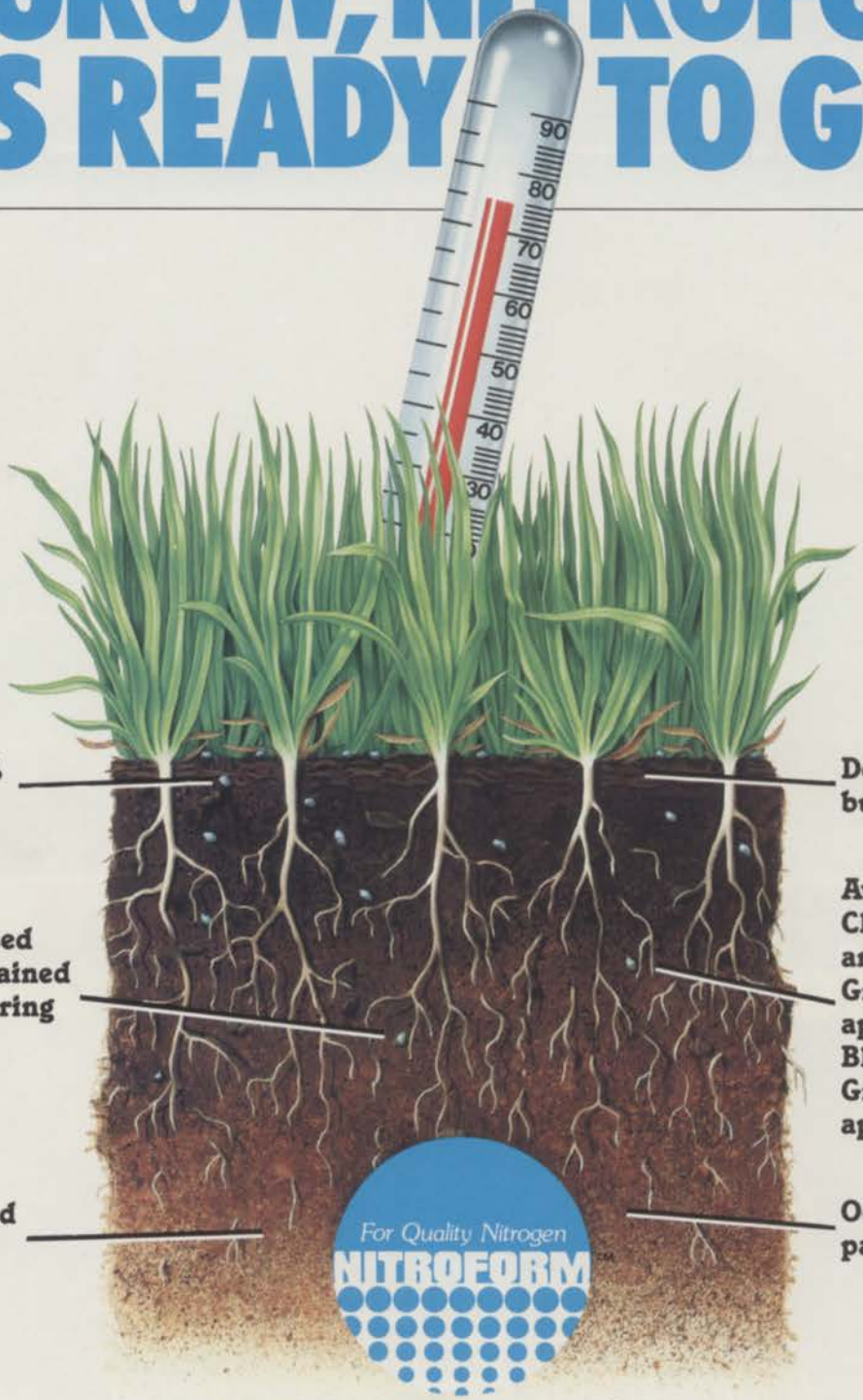

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LAWN AND LANDSCAPE
ALA MAINTENANCE

VOLUME 10, NUMBER 6 JUNE 1989

Cover photo: Mickey Jones for ALA/Maintenance magazine. Insert photo: W. Scott Mitchell, Mesa, Ariz.

FEATURES

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DEPARTMENTS

EDITOR'S FOCUS

ROUTINE FIELD BURNING PRACtices in the seed industry could soon be nullified by the Oregon state legislature.

Now being considered by the state's House and Senate is a bill designed to reduce over the next five years the number of acres eligible for burning to 50,000. The number of acres burned each year have already been reduced, dropping from 320,000 in 1972 to an average of 200,000 in 1986 and 1987 and 157,000 in 1988.

However, virtual elimination of field burning would be devastating to the seed industry. It would have the immediate result of sharply reducing yields and supplies of grass seed, ultimately eliminating Oregon as a seed production center.

A search for alternatives has been ongoing for some time, but most industry observers maintain none represent a viable substitute for burning. The field burning practice dates back to the early 1940s, but an accident last August in which seven people were killed as a fire

from a burning field spread to an interstate, prompted increased controversy over the field burning issue.

The cessation of burning, it is predicted, would result in lower seed quality; land in grass seed fields becoming dusty, weedy and untended; strict quarantine laws on many imported seeds and plants; and the release of some fungus spores such as ergot, harmful to humans and livestock, which are currently eliminated through burning.

Alternatives include propane burning, which involves moving a machine over the field using propane to scorch off the top layer. This greatly reduces the smoke, but is an expensive proposition.

Field burning is not a cost-saving measure, but a necessary practice. Benefits of burning include weed control; straw removal; a higher quality and higher yielding seed; plant nutrient recycling of potassium, phosphorous and other minerals from the ash; and genetic purity since burning destroys shattered seeds preventing them from entering the next crop.

Trade associations and lobbyists are putting pressure on the legislature to acknowledge industry concerns. — *Cindy Code* ■

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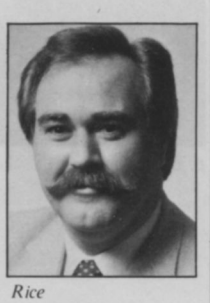

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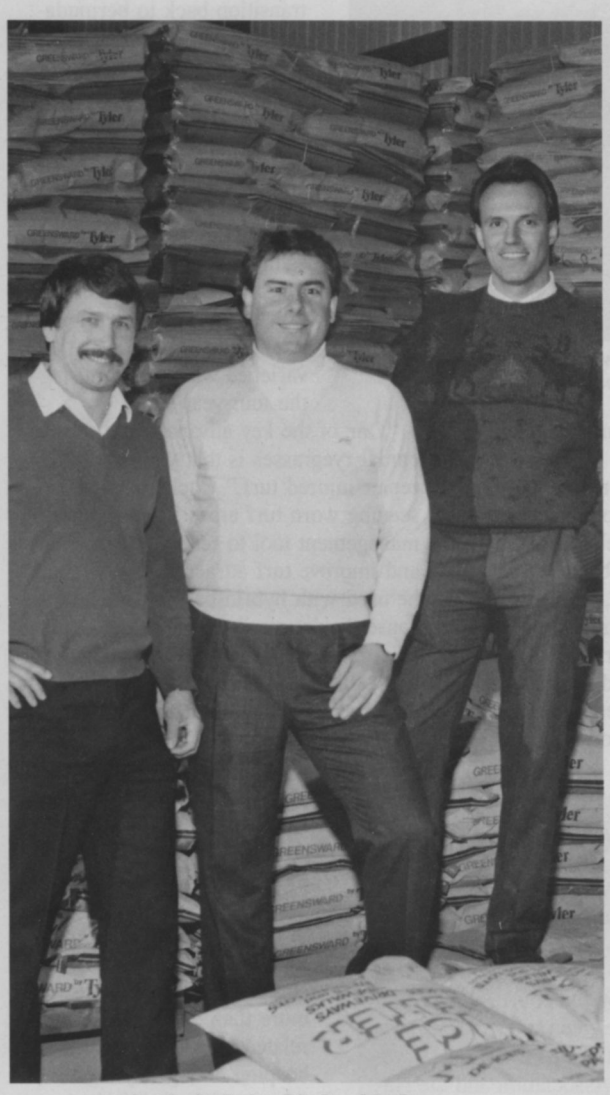

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NEWS IN BRIEF

SPORTS TURF RESEARCH AIMED AT PLAYER SAFETY

Research at the University of California, Riverside, offers new hope for those concerned about athletic injuries associated with high impact sports like football and baseball.

University scientists say new cool season turf varieties adapted to the Southwest climate provide better cushion and are safer for athletes than turf varieties currently used on athletic fields in the Southwest.

To make these findings, sports turf researchers here invented a machine, replete with cleats, that can mimic the wear and tear of a professional football or baseball game.

"Results from our four-year study indicate that new perennial ryegrass varieties offer important safety features for football and baseball players. They provide better cushion during the winter months when bermudagrasses are dormant and less capable of recovery from the stress of high impact sports. The risk of player injury is reduced with better ground cover," said Stephen Cockerham, leader of the university's sports turf research program.

Cockerham is president of the Sports Turf Manager's Association and consultant to the Los Angeles Memorial Coliseum.

Sports turf researchers are now using a cleat-clad machine which mimics the turf punishment of a football game.

Currently, warm season grasses like hybrid bermudagrass are most often chosen for football and baseball fields and parks in the Southwest because older varieties of cool season turf, like perennial ryegrass, could not tolerate the wear and tear of high impact sports.

Ryegrasses have been used routinely in winter months as an overseed for dormant bermudagrass to provide good winter color on athletic fields in the Southwest. The intent is for the cool season species to die out in the late spring or early summer, facilitating a turf transition back to bermudagrass.

Now, university research has shown several new ryegrass varieties have advantages as a primary turf surface. The Citation II variety performed best under the stress of serious sports traffic, but not statistically better than eight other varieties at UCR's National Perennial Ryegrass Evaluation Trials. Fifty-three varieties were tested during the four-year study.

"One of the key advantages of the perennial ryegrasses is that you can reseed to repair injured turf," Cockerham said. Reseeding worn turf areas is an important management tool to reduce player injuries and improve turf attractiveness. It cannot be used with hybrid bermudagrasses, because they're sterile. Seed is not available, only sod or stolons, he said.

"A shift from bermudagrass to perennial ryegrasses as the primary turf surface would require a higher mowing height, a change which may affect the play characteristics of the field. It may seem a bit slower at first, until players get used to it," Cockerham said.

Turf plays an important role in the risk of athletic injury. In 1984, the latest year for composite figures, there were more than 98,000 football-related injuries treated in hospital emergency rooms. "Some of those injuries, caused by unsafe football fields, can now be avoided," said Cockerham. "Using the traffic simulator we invented at UCR, we can identify which turf surfaces are safest for athletes."

Three years ago, Cockerham invented a cleat-clad machine, now in use worldwide for sports turf research, which can mimic the turf punishment of a football or baseball game. It is called a

(continued on page 10)

NOTIFICATION REGULATIONS STRUCK DOWN IN N.Y.

TWO LONG-AWAITED NEW York court decisions gave commercial applicators a win and a loss, but the rulings have not resulted in any immediate operational changes for applicators.

New York's Second Circuit Court of Appeals gave the green industry its second setback in an attempt to fight state notification laws, denying its appeal of a federal district court ruling.

The news gets better, however, as the New York Supreme Court struck down May 11 the state's regulations, passed by the Department of Environmental Conservation, which would have required posting of signs prior to any pesticide application among other things.

The regulations, which were to go into effect Jan. 1, were put on hold by a court-ordered injunction until the matter could be settled in court. The DEC is expected to appeal the decision, which includes a removal of the injuction. The New York State Green Council, however, is expected to file documents to keep the injunction in effect while the appeal is being heard.

"The decision basically said the state overstepped its bounds in creating the regulations," said Beth Seme, executive director of the New York State Turfgrass Association. "The legislature never wanted the regulations to go that far."

The decision also stated that the notification provisions created by the DEC would not in any way enhance public safety.

Five separate lawsuits were filed appealing the state regulations, but were combined into one by the court.

The green industry, led by the NYSTA, the Professional Lawn Care Association and the National Arborist Association among others, had contended that the state's regulations were in violation of the Federal Insecticide, Fungicide and Rodenticide Act. Both the federal district court and then the appeals court, however, did not agree, leaving the state's 1987 state law governing application of pesticides in effect.

The industry can appeal the federal ruling to the Supreme Court, but no plans have been made for such an action.

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Plush	2.0
Baron	3.0
Cheri	3.5
Victa	3.5
Geronimo	4.0
Majestic	5.0
Bonnieblue	6.0
Adelphi	6.5
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PROFIT

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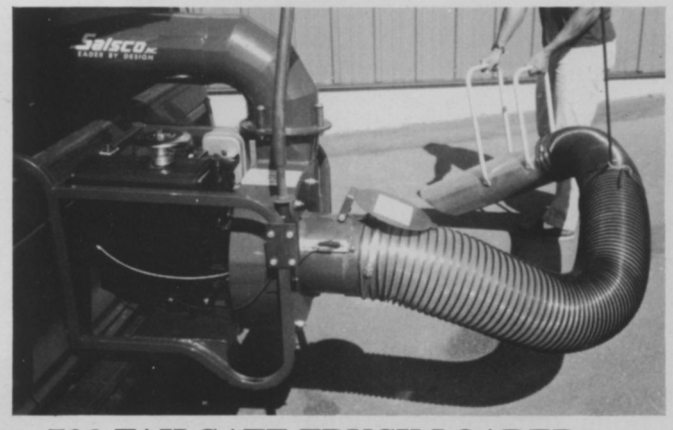
The premier greens aerator on the market, the 30-12 is capable of coring 13,900 square feet per hour, turns in a 15″ radius while aerating, and cleanly penetrates to a depth of 4″.

Manufacturer's suggested list price: $4,799.99*



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BY DESIGN

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Powered by a big 10 h.p. Briggs & Stratton engine, this rugged machine can seed 18,000 square feet per hour. For maximum efficiency, the 355 seeds a 20″ swath on 2″ centers.

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Brinkman Traffic Simulator.

Research results with the BTS show that some turf varieties stand up to the stress of high impact sports and others get hard as rock, especially if the field is not designed and put in properly at the outset.

UCR researchers had to invent the simulator because, until now, the thrust of turf research has been geared to the needs of the golf course manager, not the needs of the football or baseball player or recreational sports enthusiast.

Cultural practices such as mowing height and frequency can have as much influence on wear tolerance as varieties within a species, Cockerham said. The most important single factor in determining the wear tolerance of turf and shear strength is the biomass above the ground, he said.

'SPILL BUSTERS' RAISES INDUSTRY EMERGENCY AWARENESS

If one of your employees was involved in an accident resulting in the spill of pesticides and fertilizers, would you and your employees know how to respond?

Answer the three questions found above and see. The three test questions cover just a few of the topics found in the Professional Lawn Care Association of America's spill readiness test, designed to raise awareness of the need for a company specific spill readiness program.

The PLCAA, in conjunction with Monsanto Co., is expected to release a spill readiness training guide and audio program this month dubbed "Spill Busters." The audio training series is designed to assist the entire company — from the owner to the secretary — on the importance of following a prepared procedure for spill emergencies.

Separate audios, written in first-person, are included in the training program giving each technician, secretary, assistant manager and so on the opportunity to visualize what is happening from the appropriate perspective.

"The audio format allows companies to train their employees in a manner that doesn't interrupt the flow of work," said Barry Troutman, director of training

(continued on page 14)

TEST YOUR EMERGENCY SPILL SKILLS

IF THE POLICE CALLED RIGHT NOW to report an accident which involved one of your trucks, who could tell them exactly what materials had been spilled?

a. you
b. your secretary
c. you and any of your technicians
d. anyone in the office

If a hose breaks, what equipment do you require on your trucks to clean up spills?

a. a bucket
b. absorbent pillows
c. trash bags
d. all of the above

Which of the following spills must you and your company report to the National Response Center?

a. 10 pounds of 14 percent diazinon granules
b. 25 gallons of dilute 2,4-D in a stream
c. 150 gallons of dilute tank mix containing 1 percent diazinon
d. all of the above

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for PLCAA.

Knowing the answers to the three test questions doesn't ensure spill readiness, according to Troutman, it just brings to mind what has to be done in the event of a spill.

To order a copy of PLCAA's spill readiness guide contact: PLCAA, 1000 Johnson Ferry Rd., N.E., Suite C-135, Marietta, Ga. 30068-2112; 800/458-3466. The program is $60 for members and $80 for non-members.

PLCAA PRESIDENT ATTENDS SPECIAL OLYMPIC WINTER GAMES

Professional Lawn Care Association of America President Bob Parmley witnessed the skill, courage, sharing and joy of more than 1,200 athletes with mental retardation who participated in the International Special Olympics Winter Games in Reno, Nev., in April.

Parmley, along with Ken Ablard, marketing manager of The Dow Chemical Co., attended the opening ceremonies, met with celebrities and went to a special brunch hosted by Sargent and Eunice Kennedy Shriver, founders of Special Olympics.

"I was proud to be a part of it all," Parmley said. "By attending the games I realized the needs of the Special Olympians, and saw in their eyes the excitement of participating."

Athletes from all 50 states and 16 countries competed in alpine skiing, figure skating, floor hockey, cross-country skiing and speed skating. More than 8,000 volunteers assisted in making the games a success.

The lawn maintenance industry was named an Official Bronze Medal Sponsor of the Winter Games after Dow contributed $125,000 on its behalf.

"Our involvement with Special Olympics has generated some much-needed positive publicity," Parmely added. "It's a tremendous gesture on Dow's part, and we thank them."

BRITISH INVASION TO IMPACT LOUISVILLE EQUIPMENT EXPO

Members of the British Agricultural and Garden Machinery Association Ltd. are scheduled to visit EXPO '89 in Louisville. The GMA is, in effect, the Outdoor Power Equipment Institute's British counterpart.

With a rise in outdoor power equipment exports overseas and an increasing number of foreign manufacturers exporting to the United States, there's more industry interest in working with European associates.

NEW COMPUTER SYSTEM SPEEDS PRODUCT DELIVERY

Century Rain Aid is nearly doubling the size of its Madison Heights, Mich., headquarters to accommodate a new computer system which cuts delivery time and improves customer service.

"The computer will allow us to provide our customers with faster over-the-counter service and immediate access to merchandise from any of our 14 locations," said Century President Ernie Hodas. "Delivery will be faster, with next-day service in many cases."

The system's software, an application specialized to the distribution industry, links all of Century's locations. It gives customers instant inventory information on the availability of the desired merchandise.

The addition opened March 1.

Century's expansion also includes new outlets in Ann Arbor, Mich., New Berlin, Wis., and Downers Grove, Ill. ■

ASSOCIATION NEWS

THE **ASSOCIATED LANDSCAPE Contractors of America** will hold its four-day Interior Plantscape Division Annual Conference and Trade Show at the Boston Park Plaza, Boston, Mass., Oct. 8-11.

The IPD Conference and Trade Show, "Rocket into the 90's," attracts interior landscape owners and decision makers from around the country, and will feature educational programs, social events and an exhibition of the industry's products and services.

The trade show offers the exhibitors and attendees a number of scheduled demonstrations and exclusive trade show hours from 11 a.m. to 2 p.m. and 4 to 8 p.m. Monday, Oct. 9, and from 9 a.m. to 1 p.m. on Wednesday, Oct. 11. The show will feature a cocktail reception Tuesday evening. The event will close with the division's annual awards program and banquet on Wednesday.

Educational sessions during the conference will focus on sales, service and installation.

The revised edition of the "Grounds Maintenance Forms & Job Descriptions Guide" is now available from the **Professional Grounds Management Society.**

The expanded 48-page edition includes eight additional pages with two more job descriptions, a detailed employee evaluation sheet and a truck maintenance and load schedule. The manual is free to PGMS members upon request, and $12 for non-members ($15 if billed).

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In the interest of improving environmental quality and the preservation of trees in the urban forest, the **National Arborist Association** is developing plant health care strategies to allow practitioners to select the most environmentally sound and economically viable methods of controlling insects and diseases in the urban environment.

According to the association, there are a number of resources containing IPM technology, but there is little information about the practical application as well as the economics of its use in urban environments.

The association's IPM/plant health care system may include marketing and sales strategies, information management systems, field operations and a collection of technical resources.

Financial support for the project comes from The Paul Tilford National Arborist Foundation, The International Society of Arboriculture Research Trust, various suppliers to the industry and other resources. The project is to be completed by Dec. 1, 1990.

Anyone interested in presenting proposals for the project must submit them in writing to the NAA.

The 29th Annual **Virginia Turfgrass Conference and Trade Show,** attracted 1,139 participants to three days of varied educational programs. More than 115 exhibitors and 246 booths highlighted the show.

Donations included $5,000 to the Virginia Turfgrass Council to be used for scholarships and research, as well as $2,700 to the newly formed Virginia Turfgrass Foundation.

The "Virginia Turfgrass Council Award" was presented to Jack McClenahan for his dedication to the improvement and advancement of the council. Reelected President Dick Fisher gave the "President's Award" to Sam Kessels, recognizing his long service to the turfgrass industry. Robert Ruff Sr. was awarded with lifetime membership to the Virginia Turfgrass Council.

1990 marks the 30th anniversary of the Virginia Turfgrass Council. Plans are being made for an anniversary show Jan. 15-19.

"Panning For Gold" is the theme for the 1989 Trophy Awards competition sponsored by the **California Landscape Contractors Association.**

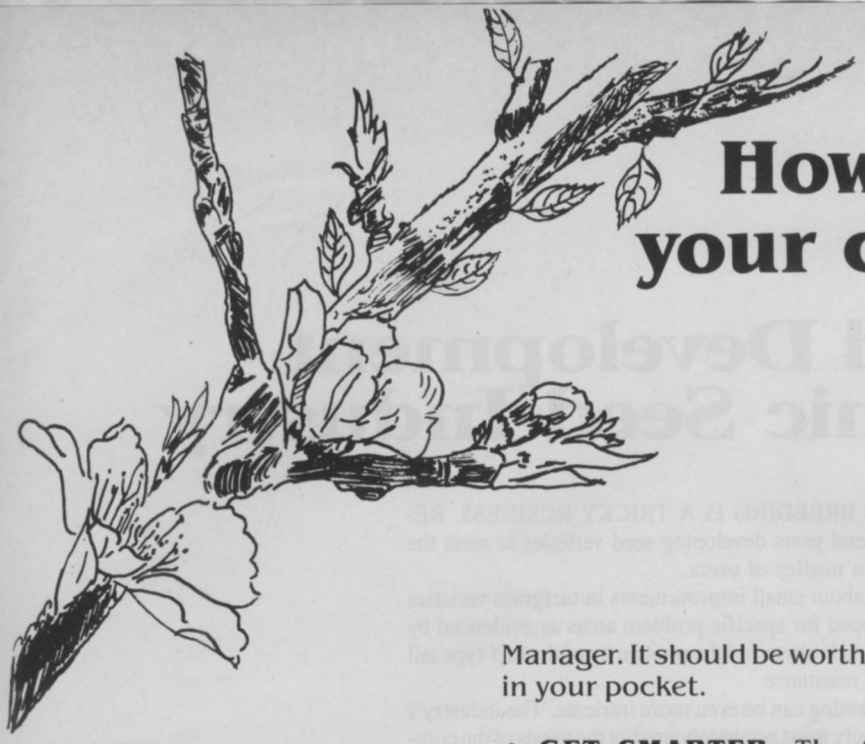
This year CLCA announced two changes to the program which recognizes excellence in the landscape industry. The first is a new category, "medium commercial industrial," for projects with landscaping costs ranging from $125,001 to $300,000. In addition, all entrants are required to submit six slides instead of three.

This year's program gives contractors a choice of 29 categories — 21 in landscape installation and eight in landscape maintenance. Seven special awards are also offered for best overall projects.

Entry forms and brochures will be sent to all regular members early this month. Entries must be received no later than Aug. 1 to avoid a $50 late fee. No entries will be considered after Aug. 10. Judging will begin Aug. 28, and awards will be given Nov. 3 during CLCA's annual convention at John Ascuaga's Nugget in Sparks, Nev.

The **Illinois Landscape Contractors Association** elected officers and board of directors at its recent annual meeting.

Bill Davids, Clarence Davids & Sons, Blue Island, was elected president; Peter Grathoff, Thornapple Nurseries, executive vice president; Frank Mariani, Mariani Landscape, Lake Forest, vice president; Scott McAdam, McAdam Landscaping, Forest Park, treasurer; Scott Byron, Scott Byron & Co., secretary; and Bill Muehlenbeck, Muehlenbeck Landscape, Des Plaines, sergeant at arms. ■



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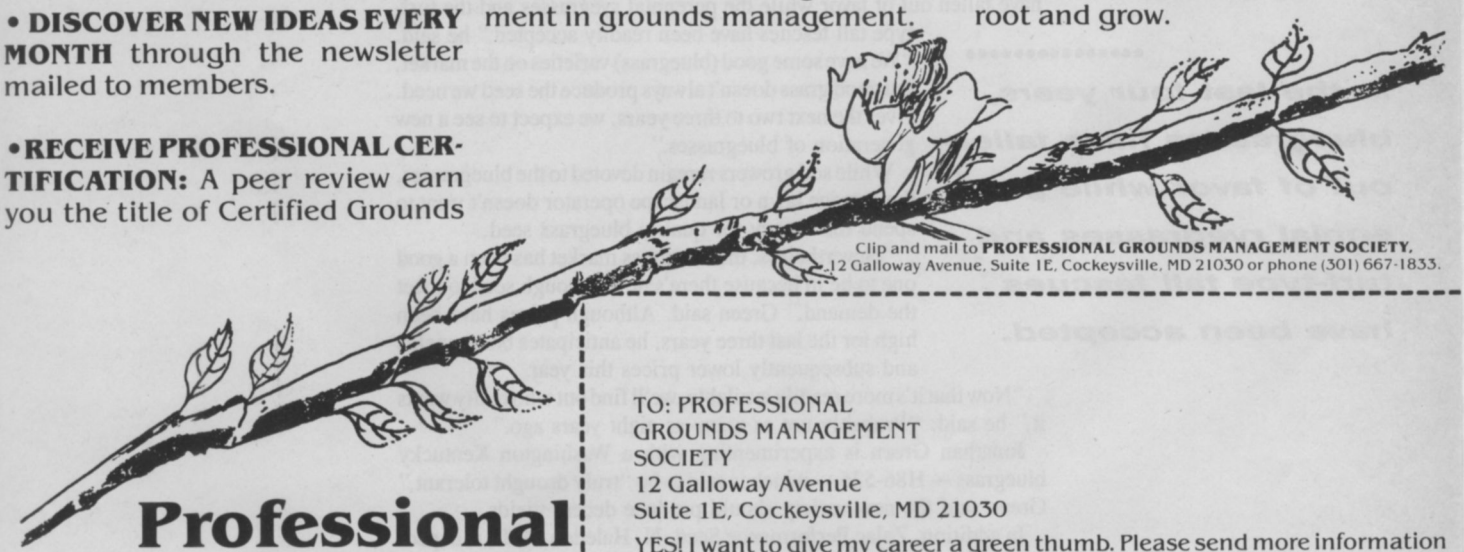

Clip and mail to **PROFESSIONAL GROUNDS MANAGEMENT SOCIETY,** 12 Galloway Avenue, Suite 1E, Cockeysville, MD 21030 or phone (301) 667-1833.

Professional Grounds Management Society

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Research and Development in the Dynamic Seed Industry

TURFGRASS BREEDING IS A TRICKY BUSINESS. RESEARCHERS spend years developing seed varieties to meet the particular needs of a medley of users.

Each year brings about small improvements in turfgrass varieties and products developed for specific problem areas as evidenced by the increased use of endophyte and the popularity of the turf-type tall fescues for drought resistance.

But turfgrass marketing can be even more intricate. The industry's seed producers not only must accurately predict the needs of the commercial seed market, but must play second fiddle to the variable weather.

Industry experts agree to a point that seed challenges of recent years — drought-tolerance, disease-resistance, deeper color and reduced mowing requirements — have been successfully untangled.

But as this dynamic industry looks to its future, new questions will invariably arise.

"The greatest challenge as I see it is trying to produce varieties which perform in the hot and humid regions of the Northeast and Mid-Atlantic states, but will yield enough out West to make it available to buy here," said Barry Green Jr., vice president/sales, Jonathan Green, Farmingdale, N.J.

A bluegrass variety would be the most logical choice to meet that challenge, Green said, despite misconceptions people have had about bluegrasses in recent years.

"Over the last four years what's really happened is that the bluegrasses have fallen out of favor while the perennial ryegrasses and the turf-type tall fescues have been readily accepted," he said. "We have some good (bluegrass) varieties on the market, but good grass doesn't always produce the seed we need. Over the next two to three years, we expect to see a new generation of bluegrasses."

In the last four years, bluegrasses have fallen out of favor while perennial ryegrasses and turf-type tall fescues have been accepted.

While sod growers remain devoted to the bluegrasses, the average lawn or landscape operator doesn't want to spend the money for quality bluegrass seed.

"Nevertheless, the bluegrass market has been a good one to be in because there's never enough seed to meet the demand," Green said. Although prices have been high for the last three years, he anticipates better yields and subsequently lower prices this year.

"Now that it's more readily available, we'll find out who really wants it," he said. "Probably not as many as eight years ago."

Jonathan Green is experimenting with a Washington Kentucky bluegrass — H86-526 — which is said to be "truly drought tolerant." Green said the new variety should produce decent yields.

In addition, Zajac Performance Seed, N. Haledon, N.J., is expecting to market several bluegrasses next year with improvements in texture and disease resistance. The company is also looking at improving the species from a production standpoint.

"We're looking at changes in the plant to enhance its ability to be efficient and produce more, because production land is scarce and at a premium," said owner John Zajac. "Bluegrasses fell out of favor because of pricing and availability, but they will always be an important part of the landscape."

Zajac, formerly president of Garfield-Williamson, recently started

Photo: Jacklin Seed Co.

his own company and acquired the rights to Eclipse, Jaguar, Jaguar II and Omega II among others, which he developed while at Garfield-Williamson.

Garfield-Williamson will continue to distribute the products, but Zajac will now develop new varieties through Zajac Performance Seed.

Jaguar II will be available in good quantities this year, and Vista red fescue will be available in limited quantities.

Lofts 1757, a new Kentucky bluegrass from Lofts Seed Inc., Bound Brook, N.J., will be commercially available this fall. The new bluegrass was highly rated in national bluegrass trials.

"It's a real challenge, those varieties which perform well in the trials do not produce good seed yields," said Richard Hurley, product manager. Lofts 1757 is not expected to produce a good yield. "There's good bluegrasses on the market, the problem's been with the yields."

BREEDER CHALLENGES. Although the industry has made great strides in improving turf characteristics such as texture, color, disease resistance, vigor and overall turf quality, turfgrass breeders continue to make adjustments in these areas.

In addition, breeding programs are stressing drought and heat tolerance in new warm season turfgrass releases as water quality and supply concerns increase. Also, several breeders are researching cold tolerance to help extend the growing season of warm season turfgrasses, and to extend their zones of adaptation further North into the transition zone.

Breeding for drought resistance will be very important over the next few years as water conservation becomes a larger issue. "We must develop those (turfgrasses) that can develop on inferior water or at the very least, less water," said Tom Stanley, marketing manager, Turf-Seed Inc., Hubbard, Ore.

Both turf-type tall fescues and fine fescues are two species de-

signed to handle drought stress, although the way they handle dry conditions differs.

The turf type tall fescues have the ability to develop deep root systems — three to four feet into the soil — tapping reserves unavailable to other turf varieties. Fine fescues, on the other hand, go dormant under drought stress and revive themselves in the fall when cooler temperatures return.

Bluegrasses and ryegrasses have varying degrees of drought resistance and breeders are looking at other species of grass, such as buffalograss and zoysiagrass, that can be inproved for commercial turf use.

"They (buffalograss and zoysiagrass) have limitations. Very little of either is being used commercially, but breeders are working on them," Stanley said.

In general, perennial ryegrasses are bred to a fairly advanced state; differences in varieties among the top products are relatively few. Breeding is now concentrated on producing varieties to meet specific market needs. For instance, developing a ryegrass more tolerant to the cold, working on varieties to solve rust problems in the Southwest and continuing to look at varieties that are slower growing, are a few examples, according to Zajac.

"There's been an awful lot of work done on tall fescues in the last several years, but we're still learning," he said.

Cool and wet weather across the United States this spring brought seed demand down for the first time in three years, but expect interest to go back up this fall.

"It was an unusual spring for seed in the East — there was too much precipitation and landscapers weren't able to get their work done," Zajac said. "(Seed) disappearance wasn't as good as it should have been, but we (industry) started pretty short to begin with."

CROP REPORT. General consensus indicates that there will be enough proprietary perennial ryegrass and Kentucky bluegrass to meet this year's demand, but the turf-type tall fescues will still be short. Strong demand for the turf-type tall fescues still outweigh the industry's ability to supply.

According to a Jacklin Seed crop report covering Northern Idaho and Eastern Washington, there is a reported 15 to 20 percent increase in the total common Kentucky bluegrass acres over last year. There is some damage in Washington due to cold temperatures and winter kill, however, the Idaho common acres are average overall. Quality should be good.

Great care is used in planting the Zoysia mother plants in northern Idaho. Photo: Jacklin Seed Co.

The overall proprietary Kentucky bluegrass crop should run about average. There will be selected shortages on some of the lower seed yielding varieties.

The tall fescue and perennial ryegrass crop in the Columbia Basin, Eastern Washington, suffered considerable damage. Most of the damage was seen on late fall plantings. With wind chill factors running as low as minus 60 degrees, no snow cover and cool winds, there was almost a complete crop failure on most of those acres.

SEED RESEARCH. Seed companies are interested in breeding new warm season turf varieties that have good yields of high quality seed in order to reduce production and supply problems. Good production on seed farms will help keep prices competitive, especially when compared to vegetatively propagated varieties.

Farmers Marketing Corp. of Phoenix and Yuma, Ariz., is extensively involved with variety improvement in warm season turfgrasses.

To date, FMS's breeding program has resulted in the release of a new and improved seeded turf-type bermudagrass — Numex Sahara. Seed production is under way and a limited supply will be available in August.

Several more high quality bermudagrasses are expected to be produced in the next few years under the direction of Arden Baltensperger, of New Mexico State University.

In national turfgrass evaluation reports, Numex Sahara was said to have fine or finer leaf texture than other seeded bermudagrasses, rated noticeably better in summer density than common and showed greater levels of disease resistance in leafspot *(Bipolaris Cynodontis)* ratings than other seeded bermudagrasses at at one location.

The new seeded turf-type bermudagrass will be available for shipment in August/September.

FMC is also the distributor of Guymon bermudagrass, a cold tolerant bermudagrass often used for low-maintenance turf areas such as roadsides, golf course roughs and parks or other turf areas where cold tolerance in turf is important such as the transition zone of the United States.

Seed production for Guymon is being tested in Arizona now, but seed production fields are already established and growing in Oklahoma where the variety has its origin. Good quantities are available through spring 1990.

A major expansion program will take Jacklin Seed Co. into the Southwest with its recent establishment of a Phoenix, Ariz., office and a research station in the Yuma and Imperial Valley areas.

The Arizona facilities will concentrate on warm season grasses, particularly the improved and newly released burmudagrasses and zoysiagrasses. Company plans call for doubling the Arizona acreage this year and next.

The expansion marks a remarkedly different approach for the Post Falls, Idaho-based company which to date specialized in cool season turfgrass. The decision to venture into warm season turfgrasses was made possible through Doug Brede, the company's director of research. Brede, who has been with the company for about three years, brought to the company his specialization in warm season turfgrasses, according to Gayle Jacklin-Ward.

Jacklin has already released a new bermudagrass to Pennington Seed called Cheyenne, showing improved cold tolerance over existing bermudagrasses.

The company expects to release three new bermudagrasses within a year, as well as a new zoysiagrass — Dash 107 — this fall for experimental purposes only. The zoysiagrass is expected to be available in limited quantities in 1990 and good quantities in 1991.

"Our capability of growing zoysiagrass from seed, rather than the old slow method using plugs or sprigging, broadens the market for Zoysia," Jacklin-Ward said.

The Arizona facilities will also enable Jacklin Seed to grow and further develop new bermudagrass varieties which are more cold tolerant. These releases have a shorter dormancy period with a uniform growth habit and dark green color.

In addition to well-publicized trends, the seed industry will take a closer look at production practices. For example, an effort is under way to discover why some bluegrass varieties are resistant to ergot and why some are not.

Jacklin-Ward said ergot infects certain varieties, beginning in the base of the plant and moving to the seed head, leaving the plant completely black and non-viable. No correlation of the disease has been determined between the proprietary and common varieties.

PERENNIAL RYEGRASSES. Perennial ryegrass seed production has become a huge growth industry in Oregon's Willamette Valley. Seed sales of perennials have expanded from 42 million pounds in 1981-82 to 85 million pounds in 1987-88, according to the Oregon Ryegrass Growers Seed Commission report.

Revenue from these sales has more than doubled since 1984 with a farm gate value of more than $52 milion reported in 1988, according to the OSU Extension Service. Acreage dedicated to

perennial ryegrass seed production has doubled from 44,000 acres in 1977 to 90,780 acres in 1988.

The remarkable growth expands the market for ryegrass seed and gives hope for continued growth in sales.

In conjunction with Cascade International Seed Co., Salem, Ore., Jonathan Green will jointly market a new perennial reygrass. Sherwood, developed by Reed Funk in cooperation with the New Jersey Agricultural Experiment Station, is said to maintain a dark green color and is known for its ability to tolerate heat and drought stress.

The seed was available in limited quantities last year, but will see good quantities this year.

The new perennial ryegrass ranks highest in endophytic content — 96 percent — according to Green. Endophyte is the by-product created by plants which are cross-bred. The fungus lives inside the seed, but is beneficial rather than dangerous to the seed, enabling turfgrass to resist a number of harmful insects such as billbugs and sod webworms.

To keep the high endophyte content, it's necessary to go back to the original seed stock field where the seed was created and grown. This way the endophyte-filled plant keeps producing generation after generation.

Endophyte was first discovered in ryegrass, but it can be bred into varieties requiring crossing. Because bluegrass reproduces itself exactly, edophyte cannot be bred into it.

Sherwood is one among several new perennial ryegrasses that have created a revolution in the turfgrass industry, according to Jonathan Green. These new dwarf plants are often referred to as "baby perennials" because of the low over all plant height and reduced mowing requirements.

Sherwood is a high seed yielding variety with showing resistance to the rust fungus that limits seed production.

NEW RELEASES. Lofts Seed Inc. will release Rebel Jr., a dwarf type tall fescue in limited quantities this year and a new creeping bentgrass for experimental use.

Turf Merchants Inc., Tangent, Ore., will be marketing Bonsai this year. Bonsai Dwarf tall fescue has a high level of endophyte for added protection from insects, and will be released through selected distributors in July.

The tall fescue forms a very dense sod due to the profusion of tillers at low angles. In addition, seeding rates do not have to be as heavy to achieve the same density of older turf fescues.

Bonsai exhibits excellent mowing qualities and has shown strong evidence of drought tolerance.

FMC has granted funds to several institutions across the United States to further their research efforts on warm season turf species such as cold tolerant bermudas, buffalograsss and zoysiagrass.

Zoysia has been used as a turf for some time now, but most commercial varieties are grown from stolons or plugs since they do not produce seed or produce so little seed that prices are quite high. New seeded varieties will be in high demand, especially if they establish and spread more rapidly than the current varieties.

Jacklin Seed will introduce three Kentucky bluegrasses — Test Code #229 offering good resistance to stem rust and leaf spot; Summit, to be released in 1990, offers is rated high in overall leaf spot resistance and exhibits excellent resistance to melting-out; and JSCO-W-1, offers resistance to powdery mildew, melting-out and stem rust.

The company will also be offering three new perennial ryegrasses — PJC, APM and SYN-P.

Turf-Seed Inc., Hubbard, Ore., will release Silverado in limited quantities this fall. The dwarf-type tall fescue produces a darker blue-green color with reduced top growth and clippings.

"One of the problems with the first generation of tall fescue was that it had to be mowed often, but turfgrass managers want to do less maintenance," Stanley said, marketing manager. "Silverado rose out of efforts to help the turf managers develop good turf."

The company will also release Murietta, a dwarf turf-type tall fescue with improved Pythium, crown and stem rust and powdery mildew resistance, and Charger perennial ryegrass. Charger is an advanced variety with selections from Citation II. It is said to have a darker green color and produce a dense, fine-textured turf. It's designed to be an improvement for winter overseeding in the South as well as for athletic fields and other hard-use areas. — *Cindy Code* ■

The author is editor of ALA/Maintenance *magazine.*

NOXIOUS WEED DISCOVERED IN IMPORTED TURFGRASS SEED

STATES FROM ALABAMA TO WASHINGTON ARE RUSHing to slam the door on a noxious weed being discoverd in samples of imported turfgrass seed.

Serrated tussock, a toxic perennial weed with unusual drought and herbicide resistance, is already considered a problem in Australia, New Zealand, South Africa and Argentina. It has shown up in the United States recently in foreign-grown tall fescue, ryegrass and bermudagrass seed. In emergency legislation, at least seven states have placed it on their prohibited weeds list.

The grass weed, *Nassella trichotoma,* has the potential to be a particular threat to U.S. turf managers, according to Dale Kern of Seed Technology, an independent seed testing laboratory specializing in turf.

Serrated tussock's aggressive, clumpy spread under dry conditions is bad news enough, Kern said. But research has also documented that tussock is fatal to sheep and causes stall-out in cattle.

"Turf managers might be concerned about this even if they aren't anywhere near a farm because the weed's toxicity to deer, rabbits and other wild animals is uncertain," he said. "No selective control is known."

In recent weeks, serrated tussock has been classified as a noxious weed by Maryland, Mississippi, Illinois, Washington, Oregon, Tennessee and Alabama. Most major seed manufacturers have placed a strict quarantine on questionable imported seed.

"Unfortunately, as we see more and more imported seed enter the country, serrated tussock may only be the tip of the iceberg," warned Kern whose Marysville, Ohio, laboratory tests seed samples for many major manufacturers as well as for individual turf mangaers.

There are several million pounds of turfgrass seeds imported by seed companies annually of variable qualities. The quality can be as high as the buyer demands.

He pointed out that in Australia alone, 184 potentially serious weeds are known which do not appear in U.S. noxious weed classifications. Argentina lists 60, South Africa 79 and New Zealand up to 50.

"Because of burning bans in the Pacific Northwest, seed producers have had to turn overseas to get the growing flexibility and economic advantages they need," Kern said. "It's hard to quarrel with that if it keeps quality seed affordable." He foresees a fivefold increase in imported seed over the next three years.

"That means it's more important than ever to keep prohibited weeds lists updated in a timely way," he said.

Turf managers have several options in addition to keeping noxious weed lists updated. They can buy certified seed, specifying that the tagged analysis still be on the bag. If they choose instead to sample their own seed, they can have it tested for contaminants by a state lab or by an independent testing laboratory.

"Some of these weeds may be difficult or impossible to eradicate once they're in your turf," Kern said. "Nine-tenths of the battle is prevention."

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Field Burning Meets Stiff Opposition in Northwest

THE HOTTEST TOPIC in Oregon politics today, and one which has proved to be inflammatory in more ways than one, is field burning.

The seed industry's practice of routinely burning its fields after harvest to clean out the soil and get rid of unwanted debris has had the undesirable side effects of air pollution, acrid odors and the hazing out of sunsets. These have put the industry at odds with many sectors of a very environmentally conscious state.

But what has ignited this smouldering issue into the full flame of an impassioned public debate was an accident which took place last August. The fire from a burning field spread to a field next to Interstate 5, and the blinding smoke which drifted across the freeway resulted in a 23-vehicle pileup in which seven people were killed.

This incident served as an environmentalist flash point. Eugene Democratic Senator Grattan Kerans orchestrated an anti-burn movement which culminated in his proposed Senate Bill 452 stipulating an immediate and total ban on field burning.

A search for alternatives has been ongoing, but no viable solutions have been found.

At the first public hearing before the Senate Agriculture and Natural Resources Committee, the most emotional testimony came from a Tigard lawyer, Richard Humphreys, whose wife, Tamara, was caught in the August pileup. Her back was broken, her intestines were ruptured and her face smashed into her steering wheel. "She watched the windshield shower outward, followed by blood, teeth and bone," Humphreys told the committee. His wife is at home and can walk, but cannot return to work.

Humphreys and other anti-burn activists argued that the seed industry should be required to follow in the footsteps of other industries which have been forced to pay expensive remedies for dangerous practices.

"Do we permit smoke stacks to belch forth industrial pollutants? Do we allow machines to be unguarded or products made with disregard for safety?" he asked. "Once we recognize the danger, we have told our industries that we will not tolerate innocent people being harmed simply because it may be costly to find a non-injurious method."

The initial environmentalist insistence upon a total fire burning ban left no room for compromise. The implicit ultimatum was find an alternative or go out of business. But David Nelson, lobbyist for the Oregon Seed Council, argued that for the industry to agree to a ban — even an eventual one — with no alternative available, was like asking a man to jump off a roof, telling him to hope that someone would give him a parachute before he landed.

Actually, a search for alternatives has been going on for some time, but most industry observers maintain none represent a viable substitute for burning. The field burning practice dates back to the early 1940s when diseases decimated entire crops in the Willamette Valley, which is the center of the seed industry. Ironically, burning had been practiced by the first ecologists, the Indians, who regularly burned the valley floor to maintain better grasslands for game.

In 1969, the city of Eugene, at the southern end of the valley, and receiving the most punishment from the smoke, demanded a ban on field burning. In 1971, the seed industry went to the legislature with a proposal for seed growers to pay for a consolidated research and development program designed to find solutions to this controversy. But not much money went into research, and the industry came up with neither an effective field burning machine nor a market for the straw.

Some stopgap measures were initiated, such as night burning or burning on windless days. Smoke was generally diverted from Eugene, but only ended up blowing through smaller towns. Meanwhile, the number of acres burned each year has been gradually reduced. Acres burned has dropped from 320,000 in 1972 to an average of 200,000 in 1986 and 1987, and 157,000 in 1988.

But, for many in the industry, there is a limit to how much burn acreage can be reduced, and there are no really acceptable alternatives. George Burlingham, president of E. F. Burlingham & Sons, Forest Grove, Ore., spoke for many in the industry when he said, "Field burning is essential for our business and our livelihood. There are no other means of controlling diseases, especially blind seed disease."

The Oregon Women for Agriculture, Silverton, Ore., has published a pamphlet listing other fundamentals of burning, including weed control; straw removal; a higher quality and higher yielding seed which is stimulated by burning, plant nutrient recycling of potassium, phosphorous and other minerals from the ash; and genetic purity since burning destroys shattered crop seeds and prevents them from entering into the next crop.

The cessation of burning, it is predicted, would result in lower seed quality; land in grass seed fields becoming dusty, weedy and

An experimental burner that never came on the market because it burned itself up in experiments (above). Glade Kentucky bluegrass (far right). The front is a non-burned portion and the back shows a burned portion. Field burning on the Rathdrum Prairie, Idaho, (right). Photos: Jacklin Seed Co.

untended; strict quarantine laws on many imported seeds and plants; and the release of some fungus spores such as ergot, harmful to humans and livestock, which are currently eliminated through burning.

Then there is the negative economic impact which the industry maintains will result from the stoppage of burning. Nelson told the legislators that the seed council regretted the accident, but that the accident should not be the occasion for a penalty on the entire industry.

The Willamette Valley, due to its favorable soil and climate conditions, is recognized as the seed producing center of the world. The approximately 1,000 farms that grow grass seeds pump an annual $300 million directly into the economy. With its ripple effects, including related businesses, tax dollars and export dollars, it adds up to a total contribution of an annual $750 million.

A worst case scenario is put forth by Craig Edminster, director of research, International Seeds Inc., Halsey, Ore. "This is a unique farming community in that there are many small farms, many century farm families. But with a no burning policy, only the wealthy would survive and there would be a consolidation into a few corporate farms. Quality would be reduced, along with increased costs and many species now grown would be eliminated. Within a very short time, the Willamette Valley would be reduced to a minor player in the international seed market."

Besides, as points out Don Mears, Pacific Northwest Production Manager, Northrup King Co., Tangent, Ore., an accident such as the August pileup is not likely to occur again, for, since that time, new regulations are in place. Currently, any field within a quarter of a mile of a freeway, and an eighth of a mile from other major highways, must be plowed or propaned into a nonburn condition. "Just this change took about 50,000 acres out of production of the burn program," he said.

But none of this elicits much sympathy from the environmentalists. John Charles, executive director, Oregon Environmental Council, Portland, Ore., said the roadside regulations, "may diminish, but won't necessarily eliminate the possibility of another accident. It's basically window dressing, and doesn't address the basic problem of people making a profit by dumping their garbage into the atmosphere."

Charles added, "I don't accept the assertion that there are no alternatives. There are alternatives. They just happen to be more expensive. But that's not my concern. I think the industry has put up artificially high standards to justify burning." Charles points to the fact that "218,000 acres are burned annually, but 350,000 acres are registered for growth and this number is expanding. That means 130,000 acres a year are not getting burned, but are producing. So somebody's fooling somebody when he says burning has to occur."

Edminster said the situation is not quite so simple. "There are a wide variety of species." he said. "For example, if you want to grow Kentucky bluegrass in the Wil-

lamette Valley and can't burn, it is unlikely you will be able to produce a viable seed crop over a period of time. On the other end of the spectrum there is hard fescue, which is a type of grass which does not like to be burned, and dies out if you burn it. These two grasses do not represent the lion's share. Rather there is a large variety of grasses in between. And if you simply stop burning, the economic impact will be serious."

Edminster said that some of the alternatives being offered are not environmentally sound. "There's talk about chemically oxidizing straw on the fields," he said. "But no one knows how those chemicals might seep into and affect the water supply."

At this writing the controversy is being debated in the Oregon legislature, but there is, as of now, no definite policy. However, Oregon Governor Neil Goldschmidt has come out with some recommendations which might indicate the direction the new laws might take. Goldschmidt doesn't favor an immediate ban, but does propose setting a deadline for a ban on open field burning that could be between three and 10 years.

Inside observers suggest that a five-year phaseout period might be in the works. The governor also recommends reducing acreage limits for open burning from 250,000 in 1989 to somewhere between 125,000 and 168,000 acres. Open burning would be allowed only in the face of "a serious disease infestation" or on limited step acreage that would erode without grass crops on it.

Some of the alternatives that are being offered are not environmentally sound.

In addition, the burning fees would be increased from the current $2.50 an acre to pay for increased research and development into alternatives to field burning. The bulk of this fee money, originally earmarked for research, now goes into the administration and regulation of burning.

Although the political hot potato has not bounced into Idaho and Washington, those two field-burning states are sure to feel the fallout of any legislative action.

Seed growers in Idaho and Washington have anticipated the time when burning may be eliminated in their states and have actively supported Oregon seed growers in their battle. Washington and Idaho growers also use the Intermountain Grass Growers Association, an organization set up to continue burning in an orderly fashion, to manage and control their programs.

The governor also recommends regulating propane burning to be sure excess smoke isn't created. Currently, there are no laws regulating propane burning, but this is one alternative that many (though not all) environmentalists accept.

As opposed to simply lighting a match for open field burning, propane burning basically involves moving a machine over the field using propane to scorch off the top layer. This alternative greatly reduces the smoke, but the problem, explained Edminster, "is that propaning is a very expensive proposition. You have to pay for the machinery and the propane and spend innumerable hours working the machine. This limits the viability of propaning to only a few species which are very lucrative. Only a small group of people can afford it. And propane burners can be used in only certain areas because of the topography."

The main problem, however, results not so much from the cost of propaning, but the disposal of straw which must first be removed from the fields in preparation for the propaning.

One practice is called stack burning. Machines are needed to remove the straw into "loafers," so called because the straw is compressed into shapes that look like loaves of bread. "Stack burning is the best alternative," said Jerry

Pepin, director of research, Pickseed West, Tangent, Ore. "For you're dealing with big piles of very dry, compressed straw. When they're set on fire, they burn very hot, and there's not that much smoke."

John Powell, a lobbyist for the Oregon Seed Trade Association, points out that a Department of Agriculture Report, November 1988, shows that the smoke factor for stack burning is 75, or about half the 160 factor (of pounds per acre) for open field burning. "Clearly, our efforts to manage the purity of the crop is in danger," he said, "and we hope to show that we can maintain our standards, yet still show a reduction in emission to be good neighbors."

The problem is, as Powell acknowledged, that the environmentalists will have none of it. "They call it 'garbage burning,'" he said.

Bill Meyer, president of Pure Seed Testing Inc., Hubbard, Ore., as well as the president-elect of the Oregon Seed Trade Association, said that there are some alternative developments in the works. One is a "mobile field sanitizer, basically a moving firebox, a more sophisticated propaner which moves the flame forward as opposed to just lighting strips."

The problem with this machine, called the Phoenix, is that it costs about $50,000. Another possibility is a Rears machine, manufactured in Eugene, which "is basically a vacuum bagger which gives the field a closer haircut. There are 19 of these being made. They have potential for some crops, though not all of them," he explained.

Meyer said machines like these are in the future, yet still only partially address the problem. "If we had alternatives, we would switch, but we don't feel that we do. All the alternatives require that we get rid of tons of straw. The farmers have been feeling the pressure over the past few years and have been building storage barns. But there are tons of straw, and there's no good way to get rid of it without stack burning."

There have been some attempts to compress the straw into fireplace logs or bricks for houses, but there's little concrete evidence that there might be a market for these products. The straw itself, high fiber and low protein, is useless in itself as feed. But there is some market for this material in Japan, Korea and other Pacific Rim countries that put the straw through a process which incorporates higher protein levels into it.

But Meyer said this market isn't nearly big enough. "We produced 600,000 tons of this straw, but only shipped 140,000 tons overseas."

Yet Senator Kerans has pointed out that the export market has been doubling every year and is expected to double again this year. And, regarding the failure of other alternatives, Kerans has argued that research money has rewarded researchers irregardless as to whether or not they've produced viable alternatives. He added this money would be better spent if it was directed to rewarding results.

In any event, Kerans has acknowledged that his absolute and immediate ban on field burning is not likely to pass, and that there has been "some softening on both sides."

What the specific political solution will be is hard to say. But the general direction does seem to be giving the growers a breathing space of about five years to come up with alternatives, accompanied by a phasing out of open field burning.

Art Wick, vice president of research and development, LESCO Inc., Rocky River, Ohio, said, "We think there's a middle ground to be reached between the extremes of the environmental lobby and the growers. We believe the middle ground will be closer to the growers' needs in the short term, but over the long-term we have to look at alternatives. It's going to be expensive. But I'm a pragmatist, and I see a simple rule of business at play here. If it costs me more, it's going to cost you more, all the way down the line." — *Michael Major* ■

The author is a free-lance writer based in Port Townsend, Washington.

Stop Water Shortages From Evaporating Your Landscapes

WHAT IS THE BEST WAY TO MANAGE AMERICA'S growing water crisis? Attempts to conserve water, especially during the Drought of 88, seem as numerous as answers on a multiple choice test.

Some choices are partly right and some are all wrong, while other responses hold the key to water conservation and the preservation of plant life. Passing this quiz may be one of America's most critical challenges. Making correct decisions will determine whether our lifestyle endures. Test your understanding of water conservation and circle one or more answers from the following choices:

A. Governments must intervene quickly with restrictions and bans on the use of automated irrigation systems for landscapes and lawns, while allowing hand watering.

B. The lawn and landscape maintenance industry should rely on continued development and greater use of advanced water management technology, such as digital and microprocessor control systems, computerized management, moisture sensing devices, superabsorbent polymers in soils, as well as underground and drip irrigation systems.

C. Increased government funding is needed for research and development of water management, particularly in rapidly growing urban areas.

D. Landscapers should be more careful in planting and avoid using imported materials.

E. Restrict the development of golf courses, reduce landscapes in commercial developments and promote the use of lifeless rock gardens for home lawns.

F. Increase the knowledge and practice of proven water management techniques and improve the standards for purveyors of water.

G. Don't worry, droughts come and go.

Native plant materials are used to meet the arid landscaping needs of the Hallick residence in the Phoenix, Ariz., area. Photo: W. Scott Mitchell.

Those who circled A or E are all wet in their water crisis thinking. First, automatic irrigation systems are more efficient than hand watering, and withholding water for more than several weeks during drought conditions will severely shock turf and plants accustomed to regular watering. Planted landscapes help capture and filter water to replenish underground water supplies and improve air quality.

In addition, golf courses are among the better managers of water use. Greater attention, however, is needed in commercial landscaping to conserve water and improve the environment. Rock gardens actually increase water runoff into sewers rather then replenish underground water supplies.

Those circling B and D are partly right, but should be cautious about seeking simple solutions. Technologies to improve water and soil management are helpful and improving, but no panacea. Careful planting techniques go a long way, but some water efficient plants from the deserts of Australia, Africa and Asia are doing quite well in the American Southwest.

Bad news for anyone who chose G. Yes, droughts come and go, but think again. Experts point to a critical need for continued attention to the science of water and soil management. Knee-jerk reactions

Like many Southwest homes, the Larson residence incorporates granite and other native plant materials in the landscape to preserve water. Photo: W. Scott Mitchell.

in a crisis are too plentiful and can produce monumental mistakes.

Finally, those circling F as their single response get a perfect score. Education and attention to the basic principles of managing water and plant and soil management, experts agree, is the single most important step to conserve water. Adhering to good water management practices brings an environmental double play of improved water and air quality.

And those who circled C in addition to F go to the head of the water management class. A little of the right assistance from governments goes a long way, according to plant scientists.

The heart of America's misunderstood water crisis is perhaps best portrayed in a brochure introducing a major water conservation and management program of the 1,200-member Irrigation Association. The preface of the recently published brochure, "No Water ... No Future," states:

"Across our country, Americans are facing the inconceivable. For perhaps the first time in memory, we are confronting the harsh consequences of dwindling water supplies.

The Irrigation Association formed its Water Conservation Development Committee a year ago, according to Bob Sears, executive vice president, due to "the continued drought and failure of urban planners to recognize their future water needs. Water conservation is a vital issue."

The near national drought last year, according to William Pogue, chairman of the Water Conservation Development Committee and IA immediate past president, "was probably on par with the drought suffered in the 1930s during the dust bowl. People became aware that water could not be taken for granted."

In some cases, government bans on lawn and landscape irrigation and sod installation, Sears pointed out, are shortsighted and harmful to the environment. "We recognize that viable landscapes are essential to the community not only from the aesthetic value, but because turf has a vital part in keeping the environment clean." In addition, urban decisions have created seas of asphalt, burdening sewer systems in heavy rainstorms. Turf is needed to replenish the underground water supply, he added.

Through its water conservation development program, the IA will make its experts available to local decision makers.

"It (water conservation) has become a hot issue because of two

INCREASING WATER CONSERVATION IN THE LANDSCAPE

AS FAR AS MAKING PROGRESS IN WATER CONSERVATion "there's no cure-all product," a manager with an irrigation equipment manufacturer candidly observed.

Though agreement with this observation is universal, there's a flurry of interest in products designed to conserve water and improve the efficiency of lawn and landscape maintenance companies.

"A lot of people think drip (irrigation) is the answer. It may be the answer in some areas or with specific plants on a landscape," said Kevin Gordon, district specifications manager with Dallas, Texas-based Weather-Matic, "but water conservation really boils down to proper design and application of materials."

However, the use of microcomputer-based controllers which automate irrigation "enhance water conservation," Gordon added. "It takes the human error factor out, but if you program the controller wrong, there's still a problem." Weather-Matic makes a series of Mark controllers.

Coupling automatic systems with irrigation by zone, according to plant types, further enhances water conservation. The complex digital control system allows versatility in cycling water based on soil conditions.

After more than 40 years of use in agriculture, moisture sensing devices are being adapted for use in the lawn and landscape maintenance industry. One such device, the Irrometer, made by The Irrometer Co., Riverside, Calif., is imbedded in the root zone and linked to an irrigation control system. The Irrometer, much like a thermostat, continuously measures soil moisture and signals the controller when a water application is desirable, or prevents its operation if water isn't needed.

In a two-year study by the Desert Water Agency in a Palm Springs city park, the Irrometer reduced water usage by 54 percent.

Another soil moisture control system, Moist O' Matic made by The Toro Co., showed 50 percent water savings in turf watering testing by the Turf Research Center at the University of California, Riverside. The company reports that the devise typically provides savings between 30 percent to 70 percent of previous water use.

Another water conservation tactic of growing interest is the use of porous rubber pipes buried five inches underground to irrigate lawns and landscapes. In the past year, demand for the irrigation system made by Porous Pipe Inc., Cleveland, Ohio, has increased by 220 percent.

"We are so packed up we can't put systems in the ground fast enough," said company president Stuart Ramsay.

When the Porous Pipe system is coupled with a moisture sensing device, water use can be reduced by 30 percent to 70 percent, Ramsay said. "The system puts water in at a very low pressure, very slowly. So there's no excess water to run away or evaporate. Since no water is above ground, none is blown away," he explained.

Ramsay said the system also reduces labor costs because its virtually maintenance free. The system isn't subject to freezing and is effective in cold climates.

Use of superabsorbent polymers to manage the delivery of water to the root zone has grown rapidly in the past three or four years, according to James Quinn, president and chairman of Industrial Services International Inc. of Bradenton, Fla. The company pioneered the development of superabsorbent technology in 1976 and makes the Terra-Sorb family of these polymers for lawn and landscape use, he said.

"In the year 2000 every landscaper who wants to influence how water is used in the root zone will use it," he predicted. "The utility has global appeal. Our business is about 20 percent export."

Some plant scientists and landscapers, though indicating the use of polymers is sound, caution that it shouldn't be a substitute for decent soil, use of proper soil amendments and effective soil management.

Another product used to aid water penetration to the root zone is soil wetting agents. The agents break down the tension between soil particles and water.

reasons — the drought and urban sprawl." Sears said. "The growth of some of our cities has become far more than planners have projected, and some didn't consider the expanded need and demand on our water supply."

The industry, Pogue explained, "can produce technologically sound products and system designs. The problem comes down to the education of the user so he doesn't waste water."

David Zoldoske, hydraulics laboratory manager at the Center for Irrigation Technology, California State University, Fresno, said "the technology is here" to conserve water. "That's no secret."

What's too often missing in lawn and landscape irrigation, however, are "better designs and maintenance. Schools, parks and homeowners just don't maintain their equipment and tend to over irrigate," he said. The ABCs of proper irrigation are "good design, proper maintenance and good scheduling."

Texas A & M University plant research scientist Garald Horst agreed. "Most landscape installers take the irrigation system for granted, kind of like they do turning on the water faucet. They should pay more attention to the design and installation and maintenance and management of the irrigation system. Apartment and office complex developers tend to try to save money on the landscape," he said.

Horst, associate professor of turfgrass physiology, warned against "doing what's expedient for the budget at the time. Do part or in phases, but don't short change it."

Landscape architects overemphasize aesthetics, Horst said. "Designs are contributing to runoff rather than capturing the water from the irrigation systems. If there is a little over irrigation, capture it rather than let it run down the street."

Western states lead the way in water conservation, Horst explained, "because water has been near and dear to them for a long time. Eastern states are now looking to the West."

The nation can do better in its attention to water conservation and management. "Water always seems to be a priority, even when it comes to national research. But when it comes to funding a lot of that, we just don't see it," he said.

Agriculture leads urban areas in its understanding of the energy and money it takes to deliver water, Horst added. In urban areas, customers pay their water bill but "don't separate what goes to everyday use and what goes to the landscape."

Urban areas, with the exception of some regions, take water for granted. Horst said he thinks too many Americans don't understand what's at stake.

"Water is biologically important and without it there wouldn't be life. We've taken it for granted because it's been so plentiful. Plants are the filter out there. Water and plants go hand in hand in the quality of life."

Horst takes a plant's eye view in his approach to the basic principles of water conservation and management. Here are a few water conservation tips:

- When you water, water well and infrequently. Try and fill the profile of the entire root system but don't over water.
- Light, frequent watering is stressful to plants. Pay attention to the relationship between watering and the root atmosphere. Under extremely high evaporative conditions, for example, plant

roots won't grow into the entire soil profile.

• Mow turf as low as a particular variety will handle. (In general, bermudagrass, one inch or less; bluegrass, 1½ to 2 inches and tall fescue, 1½ inches). Fewer leaf surfaces reduce water loss.

• Tall fescues are more drought resistant than bluegrass, have deeper roots and handle higher temperatures better.

• Pine trees, low-growing type junipers and evergreen bushes tend to be more drought resistant.

• Water between midnight and 8 a.m. This is the coolest time of day with relative humidity at its highest and water loss at its lowest. The less time foliage is wet, the better.

Though the nation's water problems — waste, drought and contamination of underground supplies — loom large and require long-term solutions, water experts believe the trend toward water conservation and wiser water management is now here.

"A revolution in landscape concepts and techniques has begun, especially in the Southwest," said water conservation author Ronald Baetz, administrative services officer of the Desert Water Agency. This public agency supplying water to the Palm Springs, Calif., desert area is recognized for its award-winning water-efficient landscape program.

"If it will work in Palm Springs, it will work everywhere," said Baetz adding that the water conservation effort in the desert area is "a voluntary, non-crisis approach."

Desert Water Agency is experimenting with techniques in the use of "new leading edge plant materials" in a 12-acre landscape project.

Baetz described water efficient landscaping as a four-point program: use of water efficient plants, intelligent site design, appropriate irrigation systems and well-informed maintenance. In the West, water efficient landscaping is widely known as Xeriscape, a term coined by the city of Denver and taken from Greek for dry landscape. Xeriscape conferences are spreading across the West.

In its effort to promote water conservation, the Desert Water Agency targets professionals in the landscape industry, including architects, designers, planners and maintenance employees. "The bottom line," Baetz pointed out, "is you may hire the best landscape architect, contractor and components and then have it all turned over to a minimum wage employee."

To illustrate this bottom line concern, golf courses, often accused of wasting water resources, are actually most efficient in the use of water, Baetz said. "This is largely because a golf course must be efficient to be profitable and employ better paid staffs."

Condominiums, even without retrofitting technology, he pointed out, have reached 35 percent water savings sustained over four to six periods by paying attention to a few simple details.

Baetz looks for the water conservation revolution to take hold in the next century. "In the water business it takes decades to get things done in building projects, making major changes and dealing with environmental issues, financing and public support," he explained. Despite this, he remains excited and optimistic. He is seeing water efficient plants, such as the Chinese date tree, once popular in the early part of this century, returning to widespread use. And landscapers are using the more water-efficient trailing indigo bush as ground cover in place of lawns and shrubs.

Water conservation efforts are, however, not entirely confined to the West. For example, the Irrigation Association of New Jersey, founded in 1974, conducts extensive research and education programs. To aid urban landscapers, the 166-member group published a 14-page brochure, "How to Save Water Sensibly: A Common Sense Approach to Water Conservation Programs."

And the water conservation movement is spreading. The Irrigation Association of New England, patterned after the New Jersey group, met for the first time in March and already has more than 60 members.

"We are trying to make cities and towns in Massachusetts as well as Rhode Island and New Hampshire aware of water conservation," said Brian Vinchesi, president of Eastern Irrigation Consultants, Pepperell, Mass. and the group's secretary/treasurer. Bans on the use of automatic irrigation systems, while allowing less efficient hand watering initiated by some local governments during last summer's drought, spawned formation of the group.

"Smaller towns are doing things to conserve water. The trouble is they aren't educated and we are trying to educate them. They are panicking," he explained. The group plans to educate its members on how to design irrigation systems to save water. It recommends using automatic irrigation system controllers and devices which shut off the system if sufficient rain falls.

Irrigation experts fear that if drought conditions continue, governments may react by total lawn watering bans. In a recent study, the Irrigation Association of New England estimated such a ban in Massachusetts would cost the state $1 million in payroll taxes as the ban impacts 2,000 jobs, a $40 million payroll and $75 million in sales in the irrigation industry statewide.

Irrigation equipment manufacturers, such as The Toro Co., Riverside, Calif., are also offering leadership in water conservation. In a major advertising and communications campaign, Toro "calls upon the irrigation industry to be more aggressive in the quest for efficient use of our nation's limited water resources." In its 1988 annual report, the company cautions that "warning signs are clear: increasingly frequent droughts, depletion and pollution of our ground water resource, new government regulation of water resources and increasing friction over water rights and usage."

Toro encourages its specifications managers, such as June Dobbins in the Midwest region, to become certified irrigation designers and educate others. Dobbins said one of her major functions is to teach design schools proper irrigation system design to avoid wasting water. She teaches at nine universities with accredited landscape architects. All together, company staff members are teaching at nearly 50 universities across the country, she estimated.

Proper soil management, according to scientists and lawn and landscape industry experts, is crucial in achieving progress in water conservation. Highly compacted soils won't allow adequate penetration of water. As a result, considerable water is wasted as runoff.

Daniel Pellegrino, president of J & D Landscape Contractors Inc., Newton, Mass., emphasized the importance of good maintenance practices, such as aeration, so water will enter the soil more effectively.

He also recommends a regular program of dethatching and overseeding to promote healthy soils. The company designs, installs and maintains landscapes, including irrigation systems.

Other ways to promote healthy soils and conserve water, Pellegrino pointed out, are:

• Zoning irrigation systems according to sun, shade, turf and plant areas. Though more costly, this practice conserves water.

• Cultivate deeper and heavier around plant materials in garden areas, creating a saucer around the plant's base to capture the water.

The water conservation movement will spread, Pellegrino said, partly because of the "back to nature trend over the past 10 to 15 years. People are putting more priority into their homes and the days of asphalt jungles seem to be disappearing."

Desert Green, Phoenix, Ariz., continually facing the challenge of growing turfgrass in the desert, places considerable emphasis on water conservation and soil management.

Marc Gillette, president of the three-year-old company, places heavy emphasis on education of its customer base. "We explain to them in detail the whats and whys of water management through a series of education pieces." He said this also "develops a much stronger bond and partnership with our customers."

The second part of the water conservation effort is to "manage the turf to its most healthy state. Healthier turf requires less water than unhealthy turf. In its soil management program Desert Green recommends services to reduce compaction, such as core aeration, and alkalinity problems."

In relating to its 2,500 customers, Desert Green, he said, "is very conscientious in its consumer awareness programs. People understand how shameful it is to waste water." — *Michael Marcellino* ■

The author is a free-lance writer based in Cleveland, Ohio.

Understanding the Basics of Landscape Irrigation

THE BASIC PURPOSE of turf irrigation is to duplicate rainfall. Rainfall, in a no-wind situation, is highly uniform. Consequently, with irrigation systems we are striving for a high coefficient of uniformity (CU): the higher the CU, the higher the uniformity of water application.

Two facts to consider about landscape irrigation: the way to achieve a high CU is by correctly spacing sprinkler heads, and the most cost-effective and most efficient way to operate the irrigation system is to make it fully automatic.

THE OBJECTIVE. Simply stated, the basic objective of a sprinkler irrigation system is to attain and maintain healthy plant growth. Ideally, this can be accomplished with a system that is well-designed, correctly installed and properly managed.

THE DESIGN. There are two phases in preparing an irrigation system design. The first phase, the *planning* phase, is the most important. This is the information gathering phase. All future decisions about the actual design will be based upon the data gathered at this time. (This work is different from irrigation master planning — an often vital, but totally separate function.)

Important areas of consideration during the planning phase include:

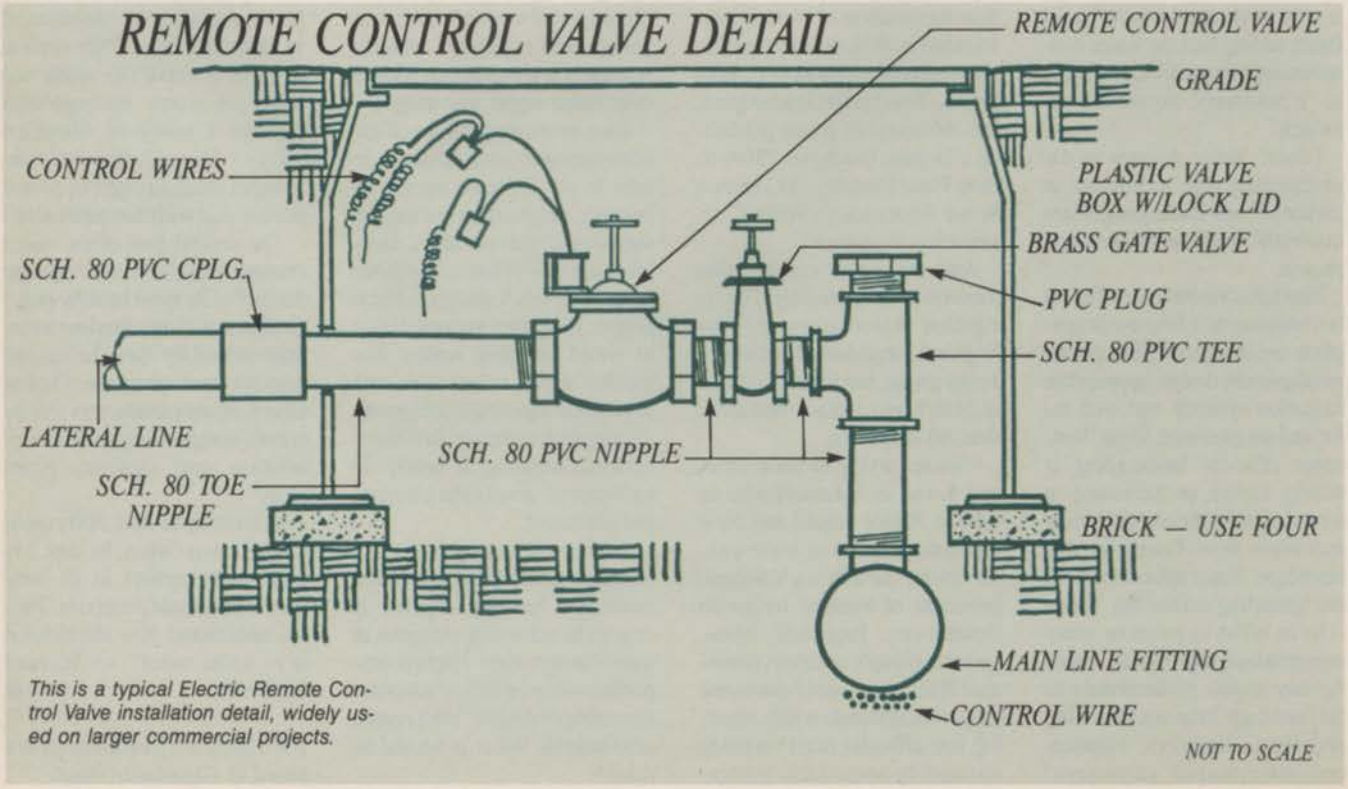
- available site utilities (water and power),
- planting, grading and hardscape plans,
- project phasing,
- site usage,
- product preferences, if any,
- sleeve locations,
- irrigation operating time constraints,
- water quality,
- budget constraints, and
- level of commitment to system management.

If system planning is thoroughly done, then the actual irrigation system design should be a highly workable, practical and affordable site specific document.

The second phase is the actual preparation of the design. Most irrigation system designs involve a series of compromises that generally revolve around material selection and system sophistication. What is hoped for is that these compromises will not adversely affect the basic quality and integrity of the system — this is a fine line.

In many designs such features as air relief valves, isolation gate valves, check valves, maximum backflow protection, drainage valves and swing risers, if determined to be essential, should be provided. Other optional items that might be considered include: a moisture sensing device, rain gauge, flow sensor and specialty valves. The merits of their use should be determined by their potential for enhanced system performance and increased system life.

Full knowledge of all of these components is essential if one is to determine when and where they should be included in the project. Also, the client will often want to know why he is being asked to buy these items. The client



This is a typical Electric Remote Control Valve installation detail, widely used on larger commercial projects.

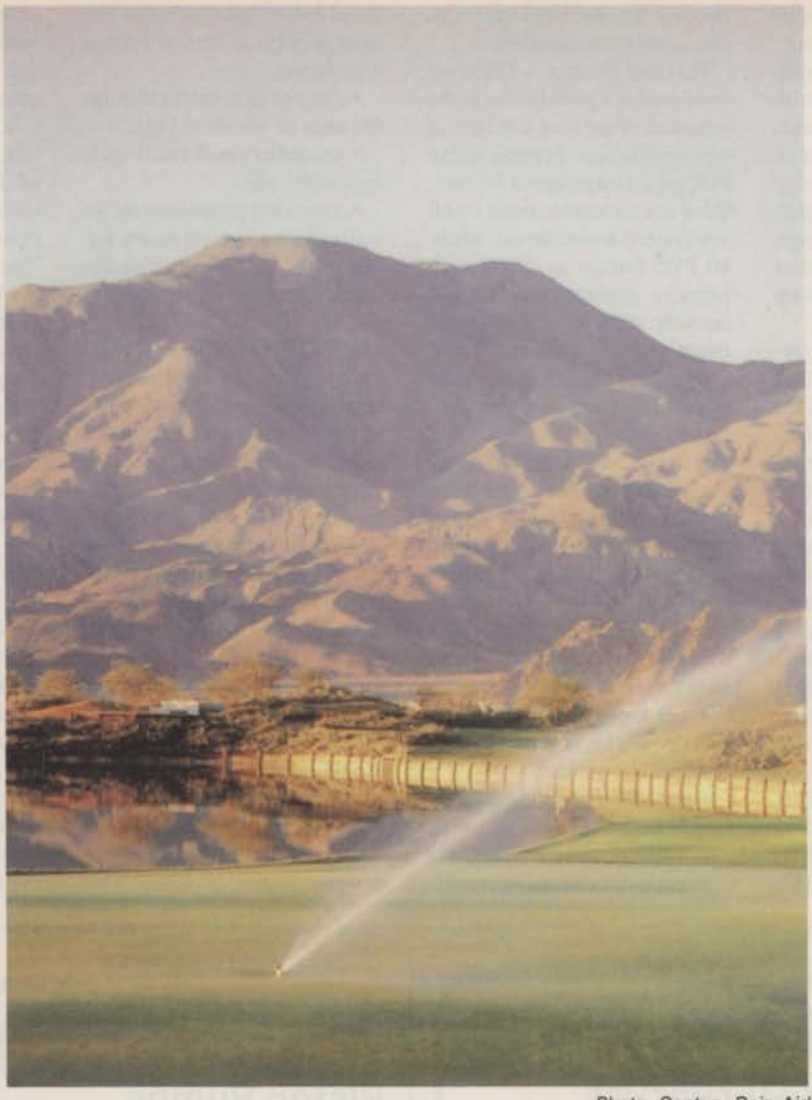


Photo: Century Rain Aid

always deserves a knowledgeable explanation.

Contractors must remember that they have some responsibilities when working with an irrigation design prepared by a design professional. An irrigation system design is, by necessity, a flexible document; it is not chiseled in stone. The knowledgeable designer knows that there are site conditions and circumstances that will require the system design to be changed or modified — hopefully only slightly.

To be on firm legal ground when changes are required, it is the contractor's responsibility to communicate any changes to the irrigation consultant, and to secure written or verbal approval prior to making the changes.

It must be remembered that there is a huge difference between *changes* and *improvements*, and that the *real* cost of a sprinkler irrigation system is not the initial cost. The *real* costs are those associated with maintaining and managing the system.

If a person has not been involved in the decision making and planning process leading up to a particular design, then it is not reasonable for that person to make after-the-fact, unauthorized design changes. However, constructive suggestions by the contractor are *always* welcome by a responsible irrigation consultant.

The irrigation consultant and the irrigation contractor are part of a team focused upon maximizing the benefits of the irrigation system for the owner. The closer these two work and communicate, the greater the possibility of a satisfactory system and a satisfied client.

THE RESOURCE. Of course, this discussion would be pointless without the essential resource of water. In many areas of the country this resource is scarce, dwindling and/or rationed. Also, in all areas of the country this precious resource is being wasted.

We are surrounded by the evidence — water sheeting across large expanses of asphalt, water running down the street gutter, sprinkler heads operating as "fountains" due to breakage or vandalism, systems totally unmanaged on a seasonal basis and water puddling in turf areas. In Phoenix, flood irrigation of major turf areas is still practiced, applying about 90 inches of water to turf that would survive nicely on 45 inches of water per year.

Conserving water in the landscape is essential. The interest in doing so is in direct relation to the cost and availability of the resource.

Many communities in Arizona and California, are already exerting influence over how landscape planting schemes are determined and how those plants will be irrigated. Micro-irrigation — low flow and drip — is required for planting areas in many locales. Drip irrigation is here to stay. We should embrace this method of irrigation for the ornamental landscape.

THE PRODUCT. The end product — the installed system — must be thought of as a permanent fixture that has the capability to be amortized. That is, its original investment cost is returned to the owner in the form of labor savings, water savings and minimized system maintenance costs.

An irrigation system may be the only turf maintenance tool that has the potential to pay for itself. The initial investment must be well thought out, with various options balanced against the long-term life of the system. Routine, scheduled maintenance is necessary to achieve maximum system use and efficiency.

Components requiring regularly scheduled inspection and maintenance include:

- filters and strainers,
- backflow prevention equipment,
- remote control valves,
- valve access box alignment and support,
- spray sprinkler heads for breakage and nozzle alignment,
- rotor sprinkler heads for breakage and correct arc of coverage setting,
- controller station operating times based upon predetermined seasonal requirements,
- drip emitters for proper flow, and
- all sensing and recording equipment for correct calibration and function.

THE EQUIPMENT. There is a tremendous range of types of equipment on the market. One of the real challenges is to select equipment designed and constructed for a specific application. Equipment that is intended primarily for residential use, particularly sprinkler heads, should not be used on commercial projects where the heavier maintenance equipment could destroy the product. A brief discussion of types of equipment follows.

Backflow Prevention — Become familiar with local codes that govern the type required for specific applications. Always attempt to locate outside of a turf

area, preferably within a shrub planting area, near a building.

Sprinkler Heads — All-plastic construction has proven reliable. Important features to consider: spring retract, built-in check valve, pressure compensating nozzles, ratcheting feature, built-in pressure regulating feature, matched precipitation rate nozzles and minimum three inch pop-up height for turf applications.

Remote Control Valves (electric) — All-plastic construction has proven reliable although, for many valid reasons, brass valves are still in wide use. Essential features for remote control valves on all size projects: manual bleed and a throttling stem. Preferable feature: internal downstream flow of manual bleed. Where required, pilot operated pressure reducing feature should be specified.

Access Boxes — All underground irrigation system components should be accessible for service and/or replacement.

Irrigation Controllers — Furnish with adequate features to suit the project. The solid-state type is more accurate and reliable. Become familiar with local codes that govern the installation.

Pipe and Fittings — There are valid regional preferences in the selection of the kind and type of pipe and fittings. In areas where PVC pipe is the preferred product, there is a noticeable trend on all size projects toward the use of Sch. 80 PVC fittings on all constant pressure applications. Become familiar with local codes that might call for a different kind and/or type of mainline pipe than is permitted for the irrigation system pipe.

Features — There are many features that should be considered that contribute toward a system that is a full landscape maintenance tool. A few of my preferences are:

- all sprinkler heads and quick coupling valves installed on full swing riser assemblies,
- quick coupling valves with vinyl covers located conveniently about the project,
- each RCV individually isolatable from the mainline with a gate valve or similar valve,
- one extra control wire (different color) installed to the furthest point(s) of the low voltage wire layout,
- a means (q.c. valve) to purge the ends of mainline pipe,
- controllers with multi-cycle capability, and
- controllers programmable for hours of running time on any station; this for micro-irrigation applications.

CONCLUDING STATEMENTS. We have all heard the phrase "... you get what you pay for." Within the broad framework of the client's needs, this simple phrase fully applies to irrigation systems.

A person's effectiveness within the irrigation industry depends upon one's attitude, level of commitment and knowledge. Attending seminars and schools is vital to one's growth, development and effectiveness within this industry.

The Irrigation Association should have in place within a year, a certified irrigation contractor testing program patterned after its well-received certified irrigation designer testing program. This comprehensive testing program will go far toward establishing a national minimum level of competency for irrigation contractors.

The Standards Review Committee of the American Society of Irrigation Consultants has authored the "Minimum Standards for Landscape Irrigation." The three-ring binder format is the third edition of this book. It contains three sections: design, installation and management. Readers of this article can order this publication for the special price of $25, postpaid from: ASIC Standards, 802 W. Comobabi Dr., Suite C, Tucson, Ariz. 85704. — *Jack Donis* ■

The author is a graduate of the University of Oregon School of Landscape Architecture, a Certified Irrigation Designer based in Tucson, Ariz., and a designer of sprinkler irrigation systems. He is currently first vice president of the American Society of Irrigation Consultants and recently accepted a three-year appointment to the Irrigation Association Certification Board of Governors.

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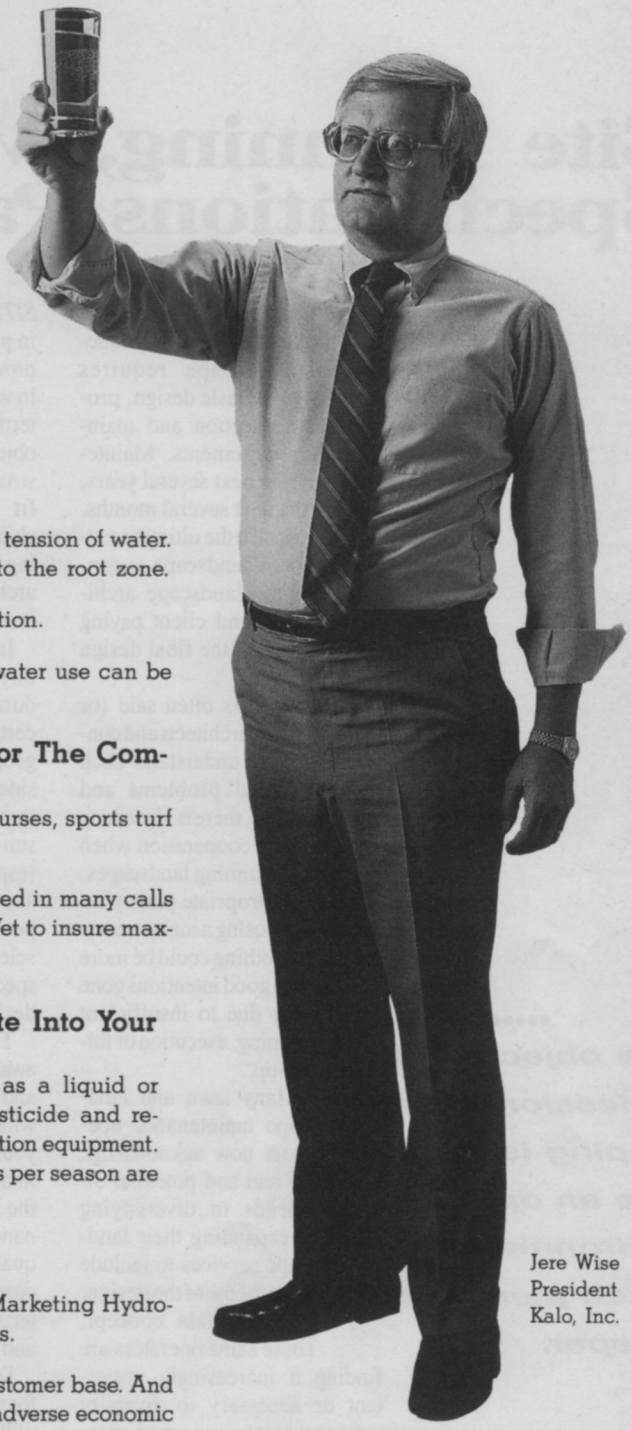

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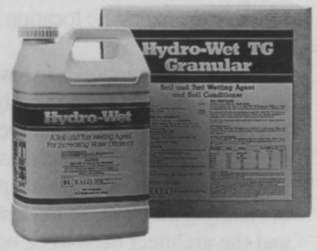

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Site Planning, Maintenance Specifications Pay Off

PLANNING, INSTALLATION and care of a successful landscape requires knowledge of basic design, proper plant selection and maintenance requirements. Maintenance for the next several years, not just the next several months.

It is critical to the ultimate success of a new landscape to consult with the landscape architect/designer and client paying the bill prior to the final design stage.

Although it is often said (or lamented) that architects and contractors don't understand each other's special problems and client relations, there is something to be said for cooperation when it comes to planning landscapes, selecting appropriate plant material and choosing a maintenance program. Nothing could be more painful than good intentions gone awry due to insufficient planning, execution or follow-up.

One objective in professional landscaping is to provide an optimum environment in which plants can prosper.

Many lawn and landscape maintenance operators now acknowledge the real and potential dividends in diversifying or expanding their landscape services to include some theme of the design/build/maintain concept. These same operators are finding it increasingly important or necessary to diversify into previously untapped markets of general landscaping and maintenance as a matter of survival.

To do so without a good understanding of some basics could prove to be a costly mistake. Let's take a look at some of the preliminary stage basics such as site planning and maintenance specifications, and how they relate to healthier plants and happy customers.

SITE PLANNING. One objective in professional landscaping is to provide an optimum environment in which plants can prosper long term. Site planning includes this objective, as well as deciding how structures and other amenities can fit in with the contour and characteristics of the land. Working hand in hand with landscape architects from the start will benefit both you and your client.

In order for plant material to thrive, not just survive for the duration of the warranty period, certain aspects of the site and geographic location must be considered. Climate and the interaction of natural elements such as sun and prevailing wind exposure (especially in winter), rainfall, snow accumulation and temperature extremes all affect the selection of plants and the final specifications associated with the design.

The contractor must also be aware of and sensitive to the needs and desires of the client — the one who is paying the bill. Most of your clients are not well-versed in architecture, arboriculture or the nature of landscape maintenance. Their perception of a quality landscape may not be compatible with site characteristics, plant material selected and maintenance demands.

Determining drainage patterns for specific soil types and how this will affect trees and shrubs is important for long-term health. It is true that it can take several years for a tree to decline and die from improper site selection or planting. Both long- and short-term results should be considered and provided for, not just the immediate aesthetics and function of a landscape.

Soil characteristics such as pH, salt concentration, fertility, organic matter content, texture and others must be determined and plants selected that will adapt to these conditions. Realistically, you may not be able to significantly alter the soil environment; therefore, you'll need to work with what you have. If the design specifications call for grade changes, no matter how insignificant they may seem, the effects of this could drastically affect the health of plants not resilient enough to adapt to changes in water and oxygen availability.

Another concern of contractors should be the mature size or height of the plant in the location desired. In getting caught-up in the excitement and promise of a new landscape, we sometimes forget to think about how large the plant will grow and if this is acceptable for the site or specific location it is planted in.

Even if the intention is to have the plant pruned periodically, many times this does not happen until it is too late, in which case pruning then destroys the shape or vitality of the plant. Your clients and the architect need to be educated along these lines. If dealt with professionally, both will listen and appreciate your input. Open lines of communication are very important from the beginning.

Most lawn and landscape maintenance operators know or will find out that the installation and maintenance of trees and shrubs requires at least a basic knowledge of woody plant anatomy, physiology, pathology, entomology and related disciplines that differs considerably from that of turfgrass. The easiest way to get into hot water with a client is to install and begin maintaining a landscape complete with trees

Overplanting can cause tremendous maintenance problems years down the road (above). Site planning should occur early and involve the client, contractor and architect (far left). Planting too high above grade can dry out roots leading to tree decline (left). Photos: Steve Day.

and shrubs, and not have answers to their simple questions that only require, on your part, basic diagnostic skills and knowledge of woody plant biology and pest control.

Other planting site considerations include how to plant, where to plant with respect to underground and overhead utilities, providing ample space for root growth and knowing when to plant with regard to the time of year and the stage of construction activity at the site.

I've often observed trees, shrubs and turf installed on-site before heavier construction activities, such as the installation of a rock wall or swimming pool, are completed. As a result, these plants are often needlessly injured by equipment and people, then decline, die or are otherwise stressed, holding out little hope for their long-term survival.

Installing plants too early in the landscape construction stage is often requested or required by the architect or client to provide for instant aesthetics or to accommodate optimum planting time.

Depending on the quality of care and monitoring one will provide for these types of plants, it may be better to wait up to a year before planting if there is reason to believe that a high percentage of plant material will soon die or suffer undue stress from factors outside of your direct control.

MAINTENANCE SPECIFICATIONS. Maintenance of landscape plants generally includes manipulation or management of the soil and its fertility, year-round irrigation practices, integrated insect and disease controls, proper pruning and repair practices and the ability to diagnose problems and differentiate them from normal and acceptable characteristics of specific plants.

Your involvement with the development of maintenance specifications starts with the architect or designer if one is involved. If not, it should start with the client before the plants are selected. Many clients wind up upset because their perception of maintenance requirements and associated costs were not what the landscape contractor had in mind. This can be a challenging task, but one which can pay big dividends in the long run.

Clients usually want large, fast growing, lush and relatively carefree plant material in their yards. Unfortunately, these characteristics are generally not compatible with hardy, pest resistant and available plant varieties in the quantities required. Most nurseries carry what sells — which is what is in high demand — and you can't blame them. But how does demand come about? From design specifications, from tradition, from client demands, from profitability and from a general lack of knowledge on the part of the purchasers, namely, contractors. This is understandable, but must be dealt with through education and patience if the problem is to change.

Clients must be educated as to the benefits of selecting plant material that is adaptable to the

site, and the growth and maintenance requirements of the plants. There is more to landscape life than honey locust, ash, maple, cottonwood, linden and Austrian pine. Of course, geographic location will dictate to a large degree what types of plants should be planted and what their maintenance needs are.

The best advice is to ask around — ask your colleagues, county extension service, local trade association executives and others for referrals to knowledgeable sources. Planting the right tree in the right location, during the right time of year, with professionally accepted maintenance practices will help ensure the life and vitality of the plant material. It will also prove to your client that you are serious about developing a long-term relationship with them and their landscape.

There are so many local requirements and nuances for maintaining plant health that one should take the time to investigate local sources of information rather than relying on information from generic specifications and maintenance charts developed for wide-sweeping geographic areas. In the long run you'll be happier and benefit from compelling yourself to learn specific maintenance needs of your plants on a local level.

Enjoy the benefits and profits that can come through developing a broader perspective of landscaping and the nurturing of relationships with other professionals.

For example, planting requirements are much different in Denver than they are in Phoenix or Seattle or Boston. The pests and appropriate control measures are vastly different around the country. The use of horticultural oils, for example, at label rates may be fine in Philadelphia, but could severely burn evergreen or deciduous foliage on plants in Cheyenne or Colorado Springs.

Winter watering is critical for certain plant genera in arid climates with desiccating winds, whereas it may not be nearly as important in wetter regions or in milder climates. This is especially true for new plantings until their root systems become established in surrounding, indigenous soil.

Start out by putting together a monthly maintenance calendar specific to your area and for the special problems affecting your plants. List pest control methods and alternatives known to work in your area with no phytotoxicity. Pass it out to everyone in the firm and encourage them to learn it.

Wherever your operation is and to whatever extent you wish to develop the landscape management and maintenance aspect of it, take the time to learn specific local requirements of your trees and shrubs from reliable local sources.

Try plants different from the "old standbys." Attend a few classes on woody plant biology and identification, pest control and similar subjects. Learn the costs of expanding into this segment of the green industry. And finally, enjoy the benefits and profits that can come through developing a broader perspective of landscaping and the nurturing of relationships with other professionals in fields you may not have been aware of. — *Steve Day*

The author is the owner of Landscapes Plus, a landscape consulting firm in the Denver, Colo., area offering management, technical and educational services to the green industry. Day has a bachelor of science and a master of science degree in plant pathology and botany and has been involved in arboriculture and landscape maintenance for more than 10 years. ■

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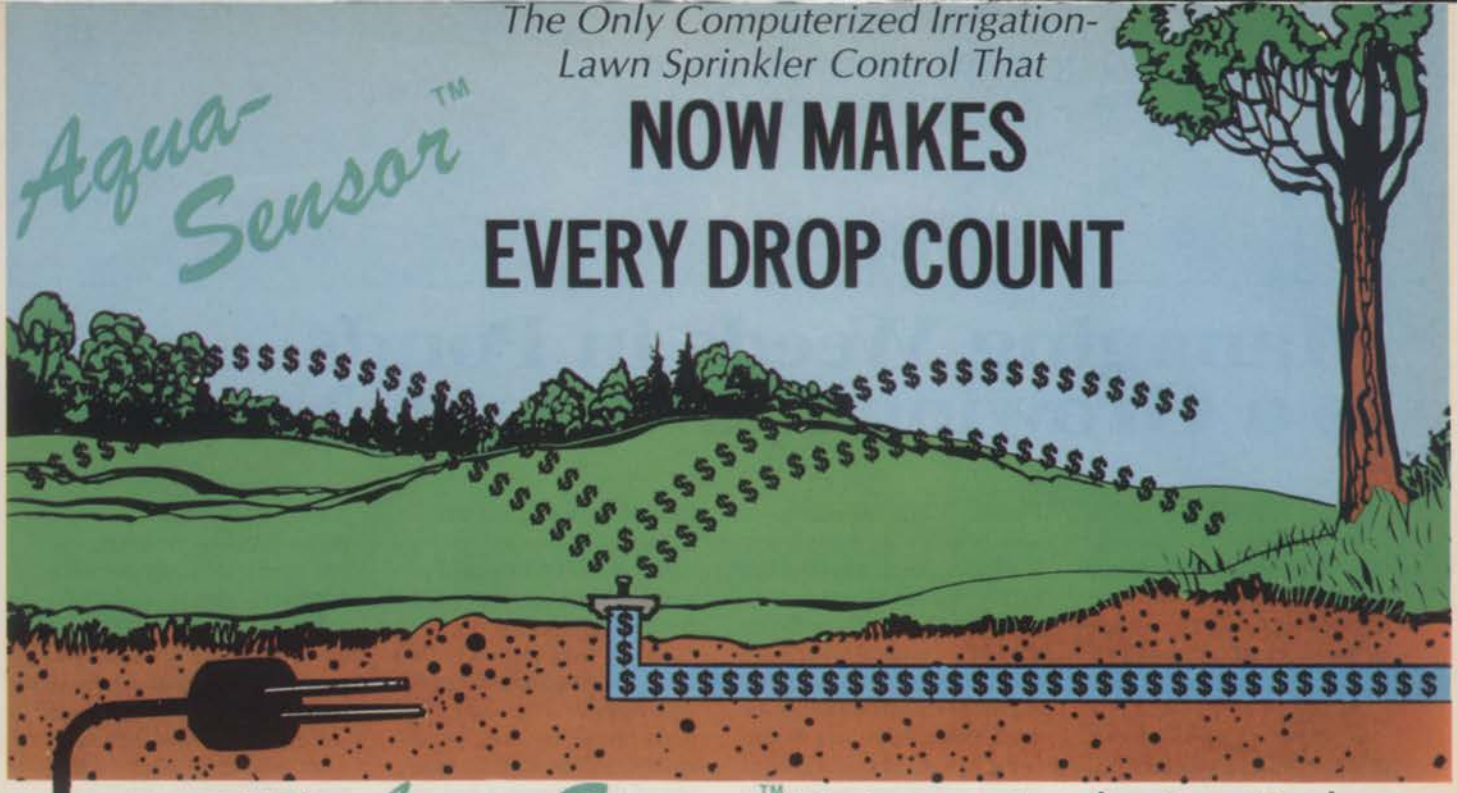

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Managing Weeds in Ponds Is a Growing Landscape Need

WITH THE GROWING interest in aquascaping — managing plants around aquatic sites — it makes good economic sense to investigate aquatic weed control as an adjunct to traditional landscaping services.

According to Jim Shue, product manager for Rhone-Poulenc Inc., aquatic weed control provides a good add-on service for lawn and landscape maintenance professionals. "The science is not new, there is not a great expense involved in entering the market and," he said, "if done properly, companies can pick up a nice piece of business."

Landscaping is a dynamic business, and Shue points out there are "now more lakes in these landscapes than ever before. And, while permits for application to bodies of water are required by many states, they are not too difficult to get. Just tell them (regulators) where, when and how" treatment will be accomplished.

Aquatic weed control methods span the spectrum of chemical, biological, mechanical and integrated methods. Currently, of all the herbicides registered for weed control, there are only 11 cleared for use in water, according to William Haller, professor of agronomy at the University of Florida. While 90 percent of aquatic weeds are controlled by herbicides, the niche is only a $100 to $150 million industry.

Chemical control is most often used in the form of a herbicide or a plant growth regulator. Application of chemicals for aquatic weed control dates back at least to the turn of the century, when copper sulfate was successfully used against algae, and sodium arsenate was used for vascular aquatic plants.

According to research by the Environmental Protection Agency, chemical controls are generally simple, inexpensive and effective. In addition, aquatic weed control products are considered environmentally safe when used correctly, according to label directions.

Biologist Bill Kraus, a consultant with Aquatic Management Services Inc., explained that "the chemicals available for use in aquatics are among the safest on the market."

In Michigan, where Aquatic Management operates, there are "only six products on the market, vs. about 3,000 for terrestrial lawn care, and these are thoroughly reviewed, at least every five years, by both the EPA and the state of Michigan."

Even though the chemicals for aquatic application are carefully balanced to be effective, but safe, licensing is required in most states, and often additional permits are necessary for specific types of application.

Sonar® from Elanco Products Co. is a broad spectrum chemical, with minimal water use restrictions, according to company spokesman John Rupp. It remains one of the company's best products for lake and pond use. A systemic herbicide, it is especially popular in Florida for controlling hydrilla.

Rodeo,® a Monsanto Co. product, is a glyphosate widely employed for grasses and cattails, and is generally cited for its ease of use and effectiveness. It has just been cleared for broader use for estuary clearance, according to William Gass, marketing supervisor for public/industrial markets.

Three factors govern the use of a chemical weed program: the species of weed in question, the time of year and the uses being made of the body of water.

The first step in control is identifying the species of weeds involved. Some weeds, for example, are more resistant and require higher concentrations of herbicides. Application time is critical. Proper timing increases positive results and reduces the hazard of fish kills.

Certain restrictions may apply, depending on the situation. Some chemicals are unsuitable for water used for human or animal consumption, for irrigation or spray water or where recreational swimming occurs, according to government documentation.

Timing of aquatic herbicide applications should be carefully considered. Generally, spring application is preferred because weed density later in the year causes poor chemical dispersion. Some products are more effective during the spring growth period, but, most importantly, there is a minimized chance during the spring that decomposing organic matter will increase oxygen levels enough to jeopardize fish.

Needed equipment varies with the product used and the area of water to be treated. Small ponds may only require hand-held, garden-type sprayers or small rotary granular spreaders. Extremely large areas may demand heavy industrial equipment, including helicopters, fixed-wing aircraft, barges and specially designed boats.

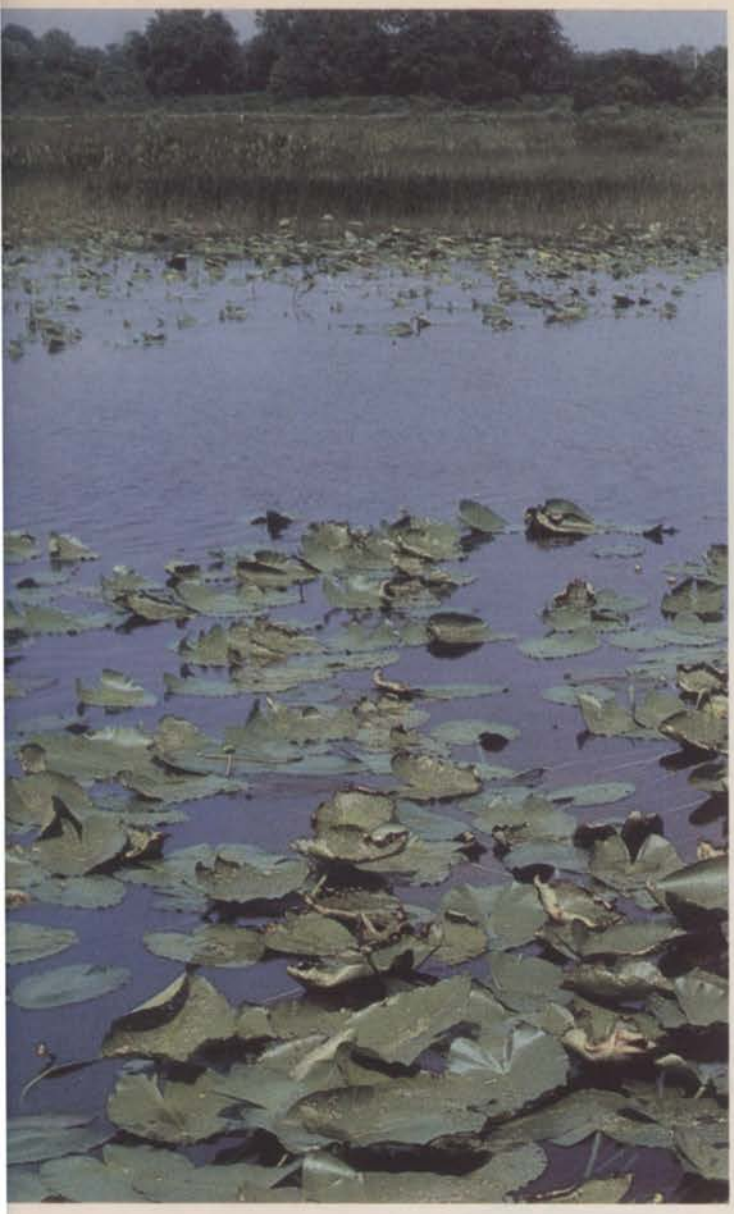
Large-scale operations may use liquid herbicides applied directly to the water.

For floating weeds, including water hyacinth, water lettuce, cattail or spatterdock, diluted herbicide can be sprayed directly on foliage. Water hyacinth (Eichornia crassipes), designated as one of the 10 worst weeds in the world, has been controlled in many areas of Florida through effective maintenance programs using 2,4-D.

Rhone-Poulenc's 2,4-D granular product, Aqua-Kleen, has been an industry staple. According to Shue, it "has done well because it just takes a boat and an electric or crank spreader." Because of the granular form, applicators can treat a piece of property along a shoreline with minimal danger of chemical trespass beyond the area treated.

Shue feels professionals shy away from the aquatic weed control market for fear the procedures are difficult or the equipment outlay is too high. "Most (landscapers) don't have the type of equipment they think they need." But application may not take heavy equipment.

For submerged vegetation,



Alligator weeds and cattails in ponds (p. 40) Interest in aquatic weed control is growing as more ponds are being used in the landscape. Photos: Elanco Products Co.

such as pondweeds, elodea, coon tail and hydrilla, diluted chemicals are injected beneath the water surface using a hose or a series of trailing hoses dangled from a boat.

While uniform distribution is essential for terrestrial applications, it is not critical in aquatic areas. The herbicide moves by diffusion and current action, becoming more evenly distributed.

When treating a large biomass of weeds, the danger to fish may be reduced by treating one-half or one-third of the area at a time, allowing the fish to move to an untreated section before completing the job.

Calculating application rates for streams, ditches and other flowing waters constitutes a significant problem, but aquascaping commonly concerns enclosed ponds and lakes.

Shading — reducing the light supply — has often proved successful in aquatic weed control. This includes use of plastic film, fiberglass mesh or dyes.

Aquashade, a chemical pesticide marketed by Aquashade Inc., is EPA-approved and registered in every state. The company is more than 18 years old and has grown chiefly through word-of-mouth advertising.

According to President Billie Wilson, the government "is looking at any product that goes into the environment, including the water, because of the possibility of misuse. Especially in New Jersey and New York, they are looking at how much, where and how chemicals are entering water.

The federal Clean Water Act regulates the industry to control ground water contamination, and regulatory bodies are becoming more strict than in the past.

Technically a chemical control, Aquashade is mechanical in the sense that it is introduced into the water from the edge and dispersed by wind and water action. Nontoxic and water-soluble, the compound turns the water bright blue. Because it must maintain the color, it is limited to contained bodies of water.

Aquashade enjoys a market share in lawn and landscape maintenance, agricultural farm pond maintenance and aquaculture (fish farming). According to Wilson, the product is "good because it's so simple, and it controls weeds and algae. Often used in combination with other products late in the year, Aquashade maintains the water for the balance of the season."

With any new enterprise today, the potential for liability is a prime consideration. According to Shue, there is "no more liability in aquatic application than for terrestrial, but there is a higher profile. A body of water is normally moving, and you have the problem of chemical trespass."

Kraus stressed, "We are basically talking about cradle-to-grave (liability) for chemicals. I want to be the first to know if there is a problem."

The negative public perception of chemical use, especially in a water environment, has led companies to explore more biological and mechanical means of aquatic weed control.

Leon Santamary, supervisor of grounds with the Cleveland (Ohio) Art Museum, uses biological and mechanical control for the 1.5-acre lake by the museum. The lake is 16 to 18 feet at the center, and is drained to seven to eight feet about once a year. Excess vegetation is removed at that time. For the balance of the year, Santamary relies on the large carp in the lake, as well as abundant flocks of ducks and geese, to keep weeds in check. He finds the geese, especially, very effective.

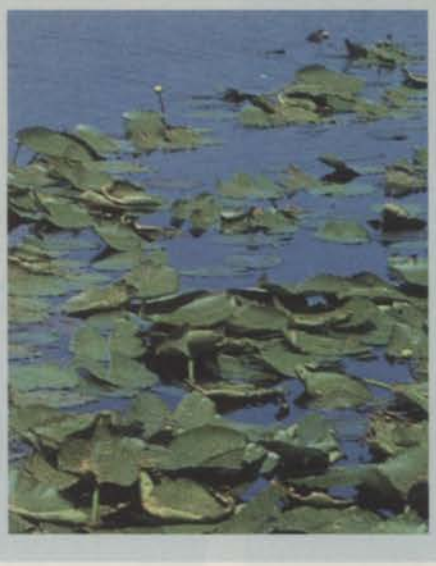
Legalization of sterile (heat-treated) grass carp added a new tool in the biological arsenal. The next step may be hybridization, crossing female grass carp with male bighead carp. Whereas the grass carp feed primarily on vascular plants, the hybrid offspring also control filamentous algae. According to one researcher, it has the greatest potential as an environmentally acceptable plant control method that he has encountered."

While Kraus agrees carp have their benefits, he cautions they may root up the bottom, be selective feeders or continue to decimate the plant population after eliminating the weed problem.

BIOLOGICAL WATER SYSTEMS MAINTAIN AQUATIC BALANCE

"A WATERSCAPE IS JUST LIKE A landscape, in that there are currents, movement and life," said Patrick Boehm, president of Aquatic Systems International. As a result, "a biological water system, should be started on the drawing board, otherwise many things aren't taken into consideration."

Boehm uses his biological system to maintain aquatic balance and return ponds to their natural state. Where practical and desirable, he installs his planting system in which four-by-four or four-by-eight plates are laid on the pond bottom, and water is pulled through at a very controlled rate. The system is 80 percent effective, compared to about 40 percent with traditional slit-pipe systems designed for under-gravel installation.



"Nature works to fill lakes in. When we deal with a lake, especially a man-made lake, we must understand that is the nature of the animal." Therefore, Boehm contends we must learn the inclinations of a body of water to change and to age, and work within parameters nature sets.

It's often "a very frustrating line of work, taking patience and desire," but it can be rewarding as well.

Boehm works with hotel and condominium construction firms, as well as landscapers, to aquascape naturally beautiful and environmentally safe pools and ponds. With a strong market building in aquascaping, biological water systems become increasingly attractive.

Because they may foul the water, he suggests that "in ornamental ponds, it might be better to add more Aquashade."

Patrick Boehm, president of Aquatic Systems International, draws on 19 years of experience in designing biological water systems.

"Water is alive," Boehm said. "It's a living entity, and it needs to be treated as such." He launched his Florida-based company in 1970 primarily as an alternative to chlorinating swimming pools.

Today he uses a system for small pools and lakes that resembles setting up a 20,000- to 30,000-gallon aquarium. The water is crystal clear, and aquascaping is accomplished with reefs, pools and plants — "lots of beautiful, flowering plants." The environments created can be adapted to most circumstances and to most weather conditions. Aquatic weed control can be a viable add-on business, and there is a groundswell of support building for aquascaping as a practical and aesthetic complement to traditional landscaping. — *Barbara Leffler* ■

The author is a free-lance writer based in Cleveland, Ohio.

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Reducing Nitrogen Loss, Increasing Efficiency in Soil

NITROGEN (N) IS ONE OF THE MOST IMPORTANT elements required for plant growth. It's part of many of the organic substances in the plant including chlorophyll, amino acids, proteins and vitamins. Even substances that do not have N in their structures require N somewhere in the reactions by which they are formed.

Nitrogen is one of the most abundant of the essential nutrient elements. It composes 78 percent by volume of the air we breathe and can be found in a variety of other forms in the environment:

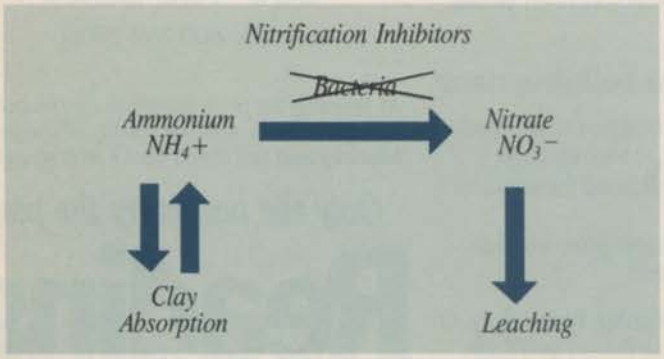
Atmospheric ..... *Nitrogen* N_2
Nitrate ..... NO_3-
Ammonium ..... NH_4+
Ammonia ..... NH_4
Nitrite ..... NO_2-
Oxides of Nitrogen ..... N_2O
Organic Nitrogen ..... *C-N*

Atmospheric N is not directly available for plant use, although it can be converted to these forms through naturally occurring processes such as lighting or through fixation by bacteria in the soil. Most of the N that is used for turfgrass fertilization, however, is produced synthetically by combining natural gas (methane), steam and air under controlled conditions to form ammonia (NH_3).

This NH_3, derived from the atmosphere, is then used to produce the wide variety of fertilizer products available on the market. Nearly all of the fertilizers used on lawns, with the exception of the natural organic materials, are derived from this synthetic N.

The total pool of N on the earth is in continuous transition through a variety of processes known collectively as the "nitrogen cycle." Nitrogen from the atmosphere is fixed in forms that can be used by living organisms, while at the same time, plant available forms are converted back into atmospheric N or are lost through leaching below the root systems of plants.

Even synthetic N fertilizers do not remain in that form indefinitely, but are in a continuous state of transformation that may lead to reduction in their effectiveness as fertilizer materials. An understanding



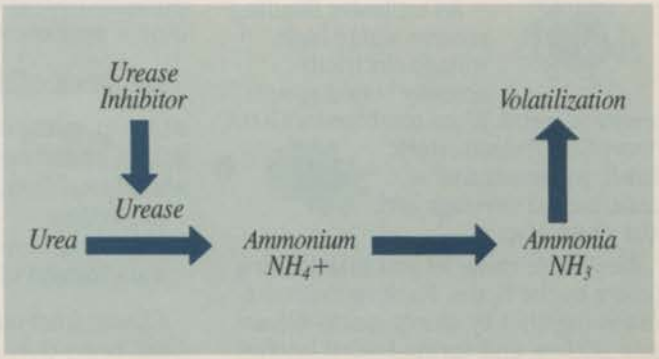


Figure 2. Nitrification inhibitors block the conversion of ammonium to nitrate (left). Figure 3. Urease inhibitors slow the conversion of ammonium to ammonia and can reduce the volatile loss of nitrogen (right).

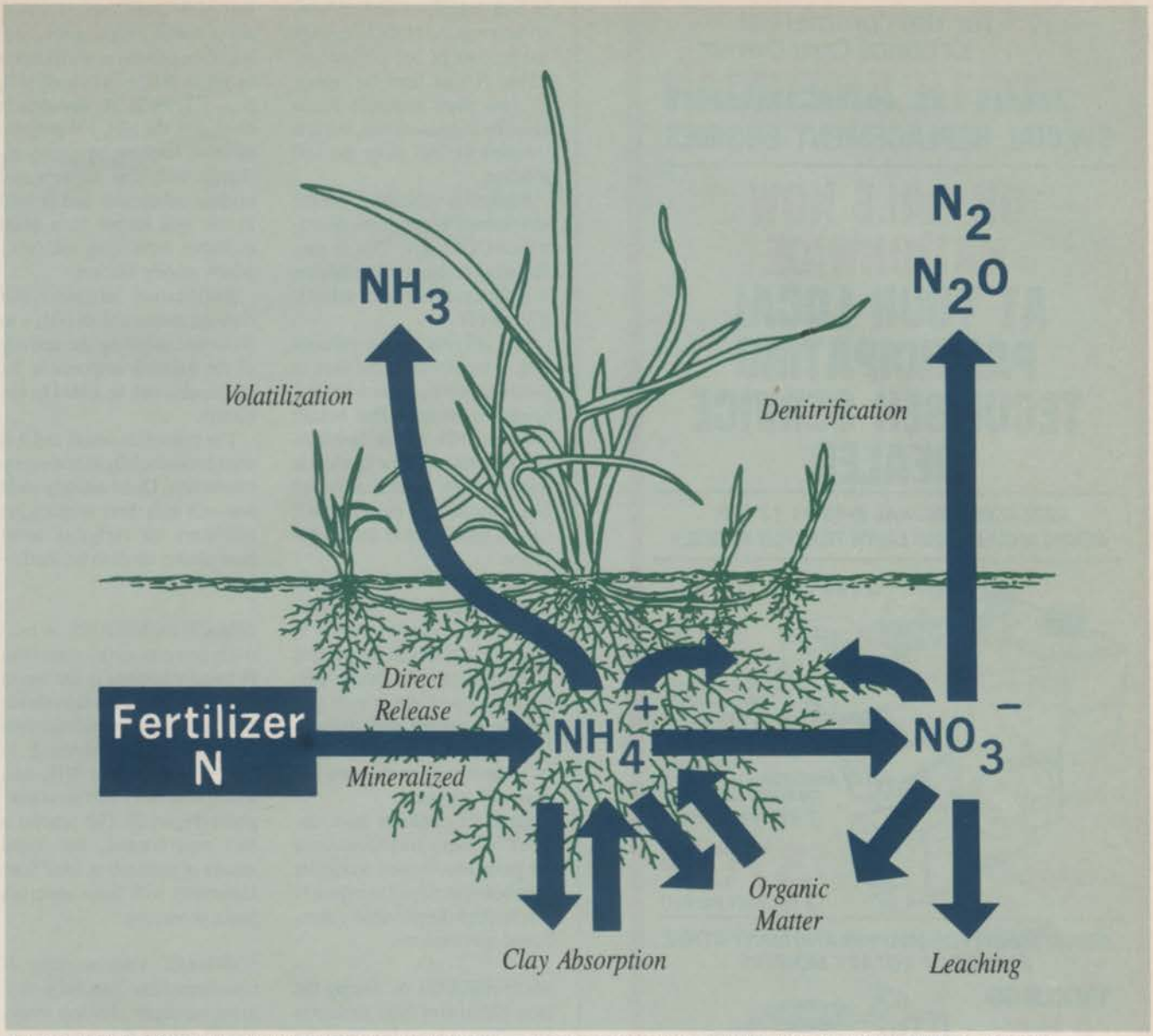


Figure 1. Understanding these transformations can also help lawn maintenance specialists design techniques to improve N use efficiency.

of these transformations has lead scientists to the development of techniques to reduce N loss. Understanding these transformations can also help lawn care specialists to design techniques to improve N use efficiency.

NITROGEN FERTILIZERS. Transformations of N fertilizer begin almost immediately after they are applied to a turf area (Figure 1). If the fertilizer material is inorganic, such as ammonium nitrate, it is released directly into the soil solution in the ammonium (NH_4+) and or nitrate (NO_3-) forms. If the fertilizer materials are of a controlled release, organic form, they are released as NH_4+ by soil microbes through a process called mineralization.

Nearly all N used by grass plants is taken up by the root system in either the NH_4+ or NO_3- form. These two materials are equally suitable for root uptake, however, NH_4+ is rapidly transformed through the process of nitrification to the nitrite (NO_2-) and then into the NO_3- form.

The NH_4+ and NO_3- have important chemical differences that affect their availability. The NH_4+ is a cation (positively charged ion) that can exchange with the negatively charged cation exchange sites on soil clays and organic matter, whereas the NO_3- is an anion (negatively charged ion) that is repulsed by the negative charges in the soil and readily leaches from the root zone.

Both NH_4+ and NO_3- can be removed from the soil solution

by soil organisms and converted into organic N form through the process of immobilization.

This N can later be released into plant available forms again by mineralization, but it is temporarily lost from the soil solution.

Some N is volatilized into the atmosphere in the form of ammonia (NH_3) gas. This is particularly a problem where the urea is applied to coarse-textured soils high in pH.

The enzyme urease releases NH_4+ rapidly from the urea in these conditions, ammonium carbonate is formed, that breaks down into NH_3 and carbon dioxide. Estimates of how much N is lost through volatilization of NH_3 vary, but it is evident that it can be significant in some situations.

Finally, NO_2- and NO_3- can be converted back into atmospheric N (N_2) or oxide forms of N such as N_2O through the process of denitrification. This is particularly a problem in soils that are low in oxygen, such as poorly drained, waterlogged soils or in turfgrass areas that are excessively irrigated.

Fertilizer chemists have understood these transformations for years and various strategies have been developed to reduce N loss through the previously mentioned mechanisms.

SLOW-RELEASE N. Among the most effective of these strategies for turfgrass areas has been the development of slow-release forms of urea.

Nitrogen release rates can be slowed by reacting urea with other organic materials, similar to how it's done in the formation of methylene ureas and IBDU or by coating urea with slowly soluble substances, much the same as is done in the production of sulfur-coated urea and plastic-coated urea.

The net result of both methods is that N is released slowly into the NH_4+ form as the plant can use it. Nitrogen is used in the NH_4+ and NO_3- forms by the plant, but the bulk of the applied N is held in the organic form to slow loss through leaching, volatilization and denitrification.

NITRIFICATION INHIBITORS. A second strategy to reduce the loss of N from applied fertilizer is based on an understanding of the process of nitrification by which NH_4+ is converted to NO_3- (Figure 2). As was already discussed, the NH_4+ is prevented from leaching by cation exchange with clay surfaces and organic substances and is held in the soil longer in a plant available form than the NO_3- which readily leaches.

Nitrification inhibitors that slow the conversion of NH_4+ to NO_3- by inhibiting the activity of the bacteria responsible for the process can be added to fertilizers.

The concept is sound and it is used commercially in grain-crop production. Unfortunately, most research with these nitrification inhibitors on turfgrass areas have shown them to be ineffective.

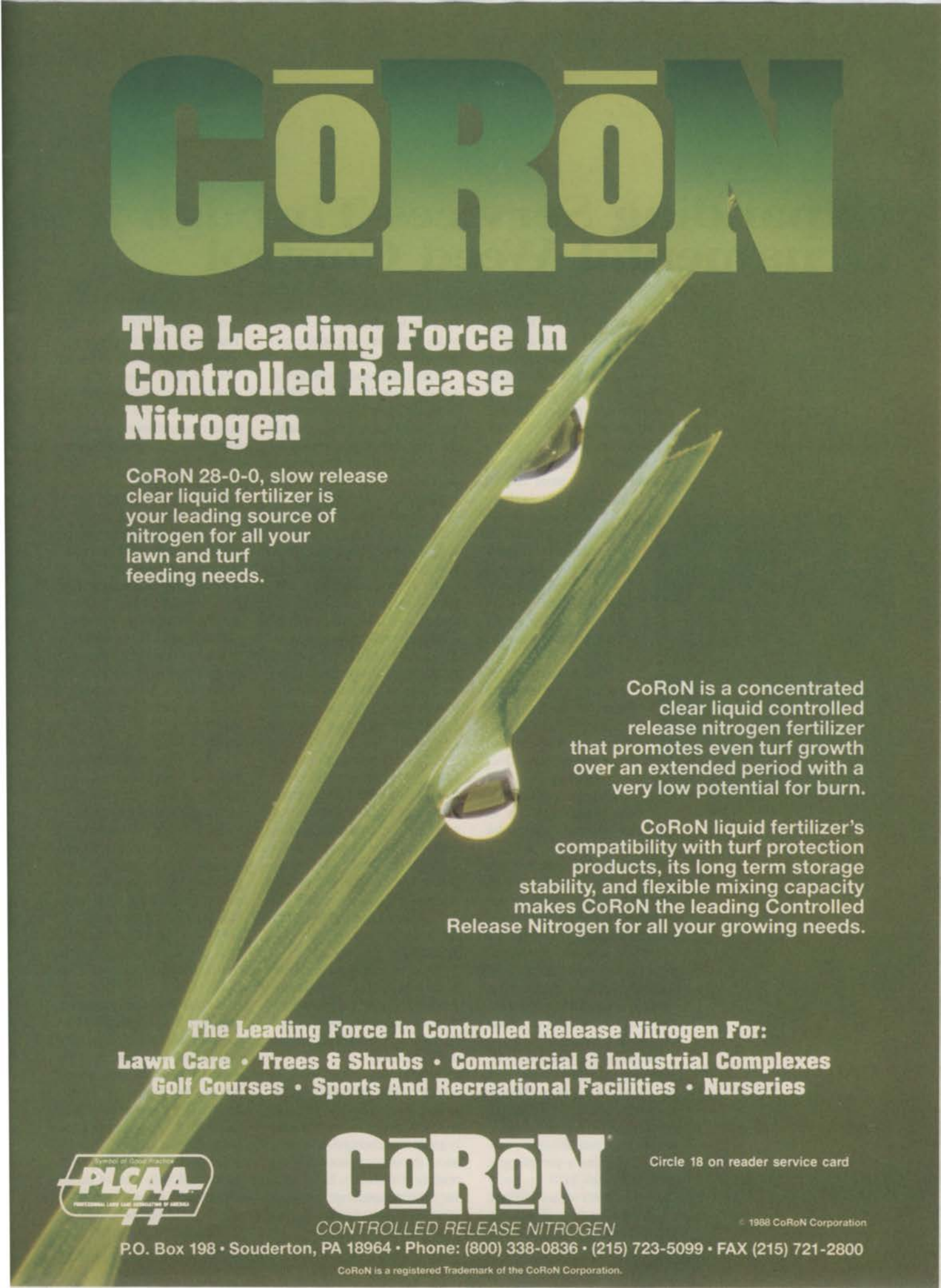
UREASE INHIBITORS. A relatively new concept in controlling N transformations is the use of urease inhibitors that slow the activity of soil urease and keep urea from rapidly converting to NH_4+ and then to NH_3 gas, which volatilizes into the atmosphere (Figure 3). This process is still experimental, but initial results of research at Iowa State University with these materials looks promising.

SUMMARY. Understanding N transformations can help turfgrass managers develop strategies to reduce N loss and to increase N use efficiency. The application of proper rates of fertilizers and the watering in of these materials is an important step.

The proper use of slow-release N sources can also help. Be careful not to overwater. Too much irrigation can increase leaching of NO_3- in coarse-textured soils and increase denitrification in heavier, saturated soils.

The proper use of N fertilizers is one of the more difficult aspects of lawn maintenance, and only through a clear knowledge of the transformations that N undergoes can an effective strategy for N fertilization be developed. — *Nick Christians* ■

The author is a professor of horticulture at Iowa State University.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Expanding Services Through Ornamental Weed Control

LAWN CARE COMPANIES looking for a way to expand their services might want to examine the option of offering ornamental weed control and maintenance as part of their total lawn care program.

Many companies are taking a serious look at ornamental care, not only from a weed control standpoint, but also from a maintenance standpoint, which includes insect and disease control. Some companies also have commercial or residential clients who request this service on a spot treatment basis or in a bid specification.

Maintaining ornamental beds is a logical add-on service.

What makes going into this aspect of lawn care desirable for lawn care operators? John Buechner, director of technical services for Lawn Doctor, Matawan, N.J., said his company is examining ornamental care as a possible option in the future for several reasons.

"I think it will give the customer the perception that we're a full-service company that they can call on to have both their shrubs and lawn taken care of," he said. "It's something that we've contemplated for a number of years, but weighing the pros and cons, it was never in our best interest to do it. But things change and we're taking another look at it."

James Hardin, president of J.H. Landscape, Cypress, Texas, said he's been taking care of landscape ornamentals for about seven years as part of his company's total maintenance package. He applies a preemergent to ornamental beds in early spring to control white clover and rough meadowgrass (Poa trivialis). Occasionally, he'll also apply a tank mixture which provides both pre- and post-emergence weed control.

Tom Hofer, president of Spring-Green Lawn Care Corp., Plainfield, Ill., said his company began controlling ornamental weeds last year. Although the company hasn't approached the concept aggressively, he said, they have put together some programs for their franchisees to offer residential customers.

"It's not a service that we've really pushed corporate wide," he said. "We've dabbled in it a little bit and made it available to our franchisees. The decision to offer this is usually based on the individual franchisee's preference. We're always looking for the kinds of additional services that fit nicely with the services we already offer, and that are profitable."

Hofer said he expects to see some geographic differences in customer receptiveness and that some areas of the country will probably be more "leading edge" in their receptiveness than others. He also said that targeting the service to specific neighborhoods, especially the more affluent ones, will be a factor in the success of this program.

"As residential customers become more aware of this alternative to pulling weeds on their own, they might become more interested in the benefits of the service," he said.

Hofer's advice to lawn care operators who are thinking about adding this service is to enter ornamental weed control cautiously and to avoid being overanxious about the service generating big revenue immediately. He said that most maintenance operators will have to actively market the service to their customers.

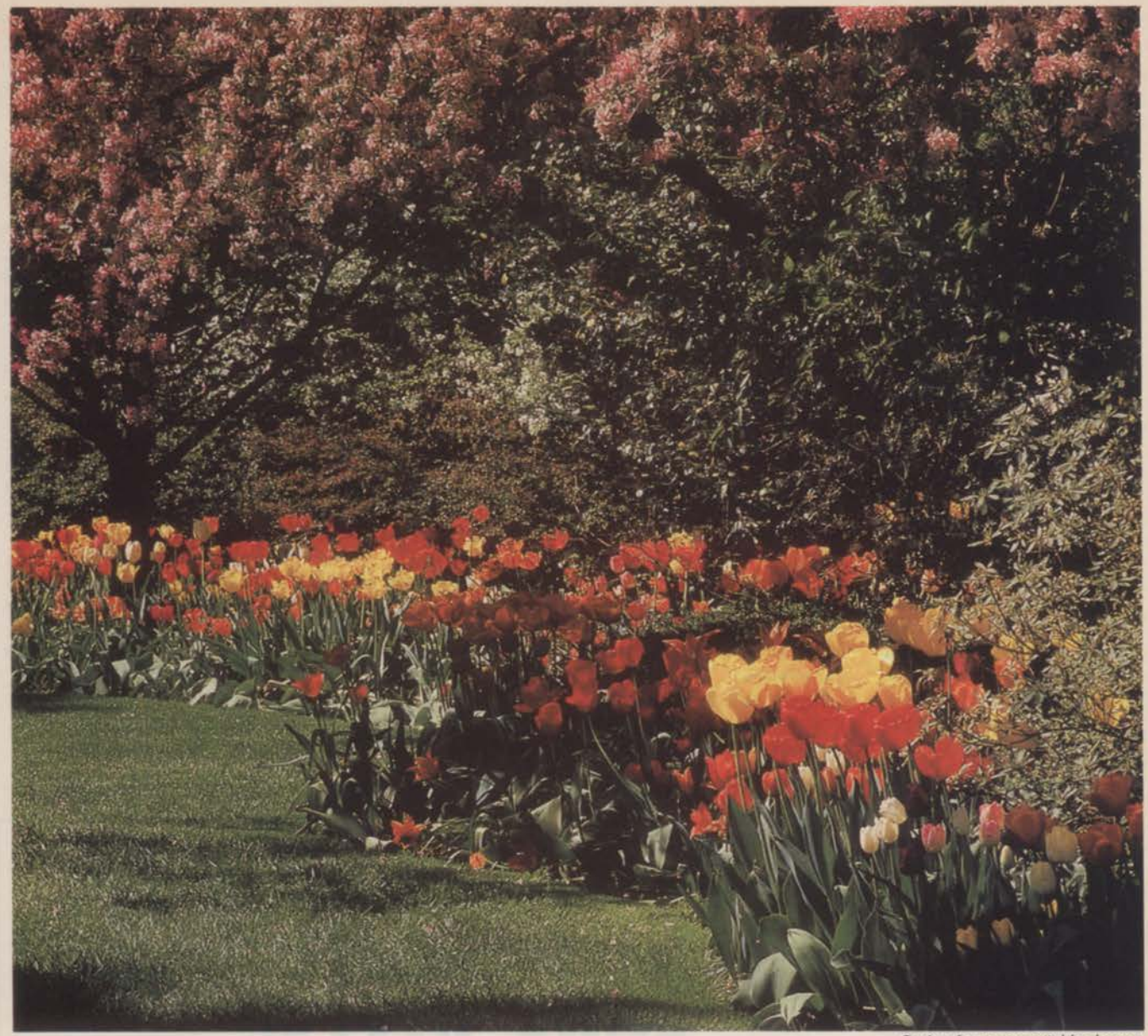
MARKETING THE SERVICE. The idea of providing one-stop lawn and ornamental care is not new. In fact, most landscape maintenance companies have included ornamental weed control in their maintenance contracts for some time. For them, taking care of ornamentals simply comes with the territory.

However, for people in the chemical application business, the concept of marketing ornamental weed control and maintenance services is rather new, and is mostly in the exploration stage. As with anything new, a boost in a company's full-service image with the possibility of increased revenue is exciting. However, there are some maintenance operators who prefer to take the "wait and see" approach before spontaneously adding a new service.

Probably the biggest concern maintenance operators may have is that they are dealing primarily with a segment of the population — homeowners — that does not have a weekly gardener or a weekly mowing crew maintain their property. The majority of homeowners mow their own lawns and weed their own ornamental beds. With this is mind, the ability to market ornamental weed control services becomes a key factor.

As Nate Robinson, vice president of Leisure Lawn, West Carrollton, Ohio, said, "Marketing ornamental weed control to this group will require an educational process that focuses on the fact that this is, indeed, a viable alternative to getting on your knees and pulling out the weeds by hand. And I think the idea will go over pretty well with a lot of people who actually get out there and do this on Saturday mornings."

Although Robinson's com-



Caring for ornamental beds can often take more time than mowing or other turf maintenance tasks. Photos: Elanco Products Co.

pany is basically a lawn care application firm dealing specifically with fertilization, weed, insect and disease control in turf, the company is seriously examining the possibility of becoming more involved with ornamental weed control as a way of providing an additional service to customers.

FACTORS TO CONSIDER. The following are some factors to consider if you are thinking about adding ornamental weed control to your service repertoire:

- If your primary function is lawn care, be sure you're established in this area before trying to diversify your options or your services. In other words, if you're not strong in basic lawn care, you are probably not going to be strong in ornamental care.
- Be aware that you must stay on top of your ornamental bed maintenance — you cannot let weeds get out of hand. Keep beds as clean as possible. This may require using a combination of mechanical control such as mulches, landscape fabrics or some hand weeding, as well as chemical control.
- Keep in mind that taking care of ornamental beds can often take more time than mowing or other turf maintenance tasks.
- If your employees have never been responsible for ornamental care, make sure they are properly trained to handle and apply chemicals. Require them to read and understand all label directions and precautions.

BASIC WEED CONTROL STEPS. The following are three basic steps in controlling ornamental weeds.

1. Eliminate perennial weeds at the site by hand weeding or using a postemergence herbicide. When using a postemergence herbicide on existing ornamental beds, be sure to keep all herbicide spray and drift off desirable plants. Read the label directions before using any herbicide.

2. Prevent new weed seed germination after you have controlled existing weeds. This can be accomplished using a mechanical method such as applying mulches, or by using a preemergence herbicide.

One drawback, however, is that it often takes a thick layer of mulch to effectively control weeds. This thick layer can decrease the amount of oxygen available to the plant, leading to fungus. In ad-

dition, some weed seeds can germinate in the mulch.

3. Control any weeds that escape the herbicide application. Do this by hand weeding or spot treating with a postemergence herbicide labeled for grasses and ornamentals present in the bed. Again, follow the label directions.

Preemergence herbicides need water to become activated. After an application, irrigate the area to achieve the most effective control. If you do not expect rain to come soon, rake the herbicide into the soil to minimize loss of activity.

PERSISTENT WEED PROBLEMS. Despite efforts to chemically control weeds in ornamentals, a few weeds can occasionally pop up even after you've sprayed an area. This may be due to an influx of new seeds carried by wind or birds. Or it could be that you simply missed a spot due to the expanse of the area that you have to cover.

"If you take care of commercial properties, you quickly discover that your clients want the property to look like Disneyland 24 hours a day with no weeds ever," Hardin said. "For example, I take care of some model homes that have to look good all the time. It can be a week before I get results from what I've sprayed, and sometimes I have to explain this to the customer so he understands why he's not getting immediate, same-day results with the herbicide."

Stay on top of ornamental bed maintenance or weeds can get out of hand.

Hardin said his ornamental weed control program at such locations involves about 30 percent chemical control and 70 percent mechanical control. He said he does a considerable amount of weeding to stay on top of the ornamental beds at all times.

Some preemergence herbicide failures could also be due to the following reasons.

- The weeds that have germinated are perennial weeds.
- The weeds were already germinated and emerged when the preemergence herbicide was applied.
- The herbicide was not incorporated or activated in a timely manner.
- The herbicide was applied at an incorrect rate. (Be sure your sprayer is properly calibrated to apply the correct amount of herbicide.)

ADDING THE SERVICE. Ornamental areas that are natural additions to your weed control program include ornamental beds; areas under fences; areas around trees, signs and poles; and in gravel drives and walkways. Caring for these areas of your customers' lawns can provide additional income to your business without increased capital investments for you.

The intent of this article is not to include everything you'll need to know about starting an ornamental weed control program. Rather, it provides some answers to many of the initial questions lawn care operators have about entering this program. — *Sean Casey* ■

The author is technical chemicals representative for Elanco Products Co., Indianapolis, Ind.

PROMOTING LANDSCAPES THAT CONSERVE WATER

A California Conservation Corps. crew digs a dry stream bed at the garden.

THE GRAND OPENING CELEBRATION of "Landscapes Southern California Style," will be June 24. The unique and timely one-acre garden is designed to showcase beautiful landscapes that conserve water.

The water conservation project is a joint effort of the Western Municipal Water District and University of California Cooperative Extension. The municipal water district donated the land for the garden, located adjacent to the water district's headquarters office at 450 East Alessandro Blvd., Riverside, Calif.

The garden includes areas of fire-retardant plants; California native plants; a microclimate/design demonstration (showing appropriate plantings for north, south, west and east sides of a home); home plantings for full, partial and no sun; an open amphitheater for educational programs; resource patios for sheltering the garden plant materials; and a maintenance yard. Also, 48 education stations have been established within the garden.

The demonstration garden's list of plant species includes more than 21 different ground covers, 45 shrubs, 30 trees, four palms, three turfgrasses and three mulches.

Tom Ash, director of the water conservation garden, said his first goal is to ready the garden for its grand opening and then to implement its educational program. A graduate in ornamental horticulture from Cal Poly Pomona, Ash has been a consultant to landscapers and architects, and is experienced in promoting the importance of landscaping.

The municipal water district has made a substantial investment in the demonstration garden project, and Ash estimates $100,000 or more has gone into it in donated materials and voluntary labor.

In a unique contractual agreement, Ash was hired as a University of California employee with the water district agreeing to provide his salary and stipulating that Chloe Beitler, cooperative extension director for Riverside County, be his administrator.

The municipal water district is funding the project's operation on a year-to-year basis through its annual budget process. The University of California Cooperative Extension office is responsible for developing and implementing the project with the water district being given the opportunity to provide input during all phases of the project.

The designed landscape has been completed and the irrigation system is 95 percent installed, according to Ash. Many volunteers have helped including Boy Scouts, master gardeners, high school garden classes and California Conservation Corps. crews.

"To date," he said, "all irrigation materials and 70 percent of all designated plant materials have been donated. The California Department of Forestry donated the use of trucks to pick up plants for the garden." Donors include more than 50 landscape industry businesses.

The garden reflects what contractors can do about some sobering facts facing them today: this area has a semi-desert climate, its population is growing, local and imported water supplies are limited and water delivery costs are increasing.

Objectives of the Landscapes Southern California Style project are:

- To develop an educational program on landscape water conservation for homeowners, commercial-industrial developers and students that explains why water should be used wisely, the benefits of water-efficient landscapes and how to create and maintain them.
- To plan and conduct a campaign to promote the project, garden and water-efficient landscapes to targeted groups.
- To strengthen the educational value of the project's garden and increase its use by encouraging community participation in its development and operation.
- To establish and maintain high standards for the garden's appearance and health.

The Western Municipal Water District is a member agency of the Metropolitan Water District of Southern California. Western provides supplemental water to some 375,000 persons with a service encompassing 506 square miles of western Riverside County.

The University of California's cooperative extension agency is the educational outreach arm of the statewide University of California Division of Agriculture and Natural Resources. Today the university's cooperative extension agency reaches thousands of Californians. ■

INDUSTRY 'RELEAF' COOLS GLOBAL WARMING

THE AMERICAN ASSOCIATION of Nurserymen will lead a national program to offset today's most serious threat to the environment. The problem, known as the "greenhouse effect" or global warming, is caused by fossil fuel burning, which releases carbon dioxide into the atmosphere and traps the sun's rays, boosting the earth's temperature.

Part of the solution, said AAN Director of Grower Services Bryan Corsini, is the "Global ReLeaf" program. AAN, together with the American Forestry Association, will sponsor national efforts to encourage and assist Americans in planting 100 million trees by 1992.

According to program supporter Sen. Tim Wirth, D-Colo., planting trees is one of the most effective and immediate steps to fight climatic changes. Wirth, who introduced legislation to eliminate gases that contribute to global warming, explained: "Trees help remove a key pollutant, carbon dioxide, from the atmosphere through the plants' own food-making process. Three well-placed trees around a house can cut home air conditioning energy needs by 10-50 percent."

Program planners charged with selecting tree-planting locations are targeting urban "hot spots" where energy consumption is highest. "By filling the 100 million available planting sites around homes and in towns and cities, we can offset U.S. emissions of CO_2 by 18 million tons each year," Corsini said.

KEEPING THE LANDSCAPE COLORFUL WITH FLOWERING ANNUALS

THE FIRST STEPS IN THE CARE and maintenance of flowering annuals are good soil preparation and proper planting. After that, it's up to the maintenance operator and Mother Nature to keep color at its peak. If maintenance is a consideration, choose less demanding annuals.

FERTILIZING. Most annuals do not require high levels of fertilizer, but will do much better if adequate nutrients are available. Notable exceptions to this are nasturtium, spider flower, portulaca, amaranthus, cosmos, gazania or salpiglossis, which like to be grown in poorer, infertile soils.

With these, the fertilizer incorporated before planting is adequate. With other annuals, you can fertilize once or twice more during the growing season with 5-10-5 or similar at the rate of one to two pounds per 100 square feet. As an alternative, you may use a soluble fertilizer such as 20-20-20 mixed at a rate of one pound per 100 gallons and applied every four to six weeks. Soluble salts should be checked on a regular basis to ensure that roots will not be damaged by excessive fertilizer applications.

WATERING. Deep, infrequent watering is generally better than frequent, light applications as the former encourages deep root growth. Watering generally needs to be performed about as often as turf needs to be irrigated. Refer to individual plant descriptions for guidelines on those plants that like more or less moisture. When annuals need less water than the surrounding turf, raised beds are a "must" for the uniform growth of both.

The foliage should be kept dry if at all possible during watering. Soaker hoses work best. However, if overhead sprinklers must be used, you should water those annuals that are disease prone (zinnias, calendula, grandiflora petunias and stock in particular) as early as possible in the day so the foliage will dry off before night, lessening the chance of disease.

MULCHING. After your bedding plants are planted, adding a two- to three-inch layer of mulch will not only add a note of attractiveness, it will also reduce weeds and conserve soil moisture, resulting in better growth.

The best mulches are organic in nature,

Petunia trees. The reality can be even more dramatic than the sketch when flowers are properly cared for.

such as bark chips, pine needles, shredded leaves, peat moss or hulls of some kind. The following year, the mulch can be incorporated into the soil before planting, enriching it. Additional mulch can be added each spring, resulting in better soil structure and therefore better growth as years pass. Apply additional high nitrogen fertilizer such as ammonium nitrate at the rate of one to two pounds per 100 square feet when adding fresh mulch. This will compensate for the nitrogen used during decomposition of the mulch.

WEEDING. In additon to supplying the basic requirements for good growth, you will want to weed your plants to keep their appearance as appealing as possible. Weeds may appear, even though you used mulch and preemergent herbicide. Be sure to remove weeds as soon as possible so they do not compete for water and nutrients. Remove them carefully, especially when the annuals are young, so you do not disturb their roots.

RESEEDING. Some annuals, notably impatiens, portulaca, salvia and nicotiana, will reseed from one year to the next. As many annuals are hybrids, the seedlings may not be identical to the parent, but will differ in flower color and often be less vigorous. It is best to remove these and replant all flower beds and borders each year for maximum effect.

MANICURING. Many annuals, chiefly begonias, impatiens, coleus, alyssum, ageratum, lobelia, vinca, salvia and others, require little additional care. Their flowers fall cleanly from the plant after fading and do not need to be manually removed. Others, such as marigolds, geraniums, zinnias, calendula and dahlias will need to have faded flowers removed. This is known as deadheading and is necessary to keep the plants attractive, from going to seed and to prevent disease. The plants will produce more flowers and will be tidier. Deadheading can be done with pruning shears or sometimes with the fingers.

A few annuals, primarily petunias, snapdragons and pansies, may need to be pinched back after planting or after the first flush of bloom to keep them compact and free-flowering. As new hybrids are created, this is becoming less of a maintenance requirement. Sweet alyssum, candytuft, phlox and lobelia may tend to get overly sprawling and encroach on walks, turfed areas or other flowers. They can be headed back with hedge clippers if this occurs. This sheering may also encourage heavier blooming.

INSECT AND DISEASE CONTROL. Annuals can be relatively trouble free, with few insect and disease problems, provided they receive proper cultural requirements. Those already mentioned as being prone to diseases should be planted in areas where the air circulation is good, and if possible, the foliage should be kept dry. When this cannot be done or when rain is frequent, fungicide treatment may be necessary.

The most common insect problems that might appear are aphids, white flys or spider mites; these again are easily controlled with a number of pesticides. Mites and white flys are less of a problem when moisture levels are high and plants are frequently watered. When temperatures are high, insect populations will increase and more frequent pesticide treatments will be necessary.

Where slugs and snails are common, you will find that they can feast on young bedding plants, especially marigolds, petunias and salvia. Place slug bait near new plantings in late afternoon and replenish as necessary. Many of the baits lose their potency after irrigation or rain. — *Professional Plant Growers Association* ■

PEOPLE

Weakley

Rafos

SNAPPER POWER EQUIPMENT RE-cently promoted **Don Weakley** to executive vice president.

Weakley joined Snapper in 1964 as Southwestern area sales manager. He was promoted to assistant sales manager in 1969, vice president/national sales manager in 1973, elected to the position of vice president/director of marketing in 1979 and appointed to the position of senior vice president/director of corporate development in 1985.

In his new position, Weakley will be responsible for the sales, marketing, advertising, customer service and corporate development activities of the company.

A new division sales manager and three sales representatives were recently appointed to Lebanon Total Turf Care, a division of the Lebanon Chemical Corp.

Paul Grosh was promoted to sales manager of the Southern and Mid-Atlantic sales division. Grosh joined the company in October 1987 as a sales representative. He will now be responsible for market development, pricing, sales training, account assessment and assignment among other things.

Mark McClure, Paul Olson and **William Smith** have joined Lebanon as field sales representatives for professional turf and garden accounts.

McClure will handle sales and service of accounts throughout upper New York; Olson, sales and service of accounts in the upper Midwest/Great Lakes region; and Smith, sales and service of accounts throughout southeast Pennsylvania and central New Jersey.

Outboard Marine Corp. named **Stuart Rafos** a vice president of OMC and division manager of the company's Cushman Division, headquartered in Lincoln, Neb. Rafos replaces Clarence Bangert, who retired after 42 years of service with Cushman.

Prior to joining OMC, Rafos was president of FWD Corp., Clintonville, Wis., a manufacturer of fire fighting vehicles and other specialty equipment.

Rain Bird Sales Inc. Agri-Products Division recently named **Jack Buzzard** vice president. His new responsibilities include engineering, manufacturing, marketing and sales of all agricultural products worldwide. Buzzard will retain his position of vice president of Rain Bird International, and continue to oversee marketing and sales of all Rain Bird products internationally. ■

FINANCIAL CORNER

LOAN PACKAGING: DOES IT INCREASE YOUR CHANCE FOR A LOAN?

NOTHING IS MORE DIFFICULT FOR the average operator than to obtain financing for a lawn or landscape maintenance operation. That is, nothing is harder to find than affordable financing for anything as foreign to a lender as lawn and landscape maintenance.

Fortunately, there is at least one way to ensure that a request for a loan will get a full and fair hearing. The route most of us are familiar with is filling out a loan application for submission to a loan clerk. But, the average operator who completes a loan application at his neighborhood bank is, at best, limiting his options.

An experienced lawn and landscape maintenance specialist often ignores the loan application — and often even ignores banks — to get the money he needs at a price that he feels he can afford. The tool employed most frequently is a so-called "loan package."

A loan package provides all of the factual information normally contained on a loan application. But a properly prepared package also provides ample opportunity to expand on why the funds are needed, how they will be repaid, etc. Relevant financial data can be explained in a loan package far beyond the barebone statement of facts and figures asked for on a loan application.

A complete explanation of how your operation works, where it fits in within the industry and its potential can be included in a well-prepared loan package. In addition, with a loan package in hand, it is possible to obtain funds from a variety of sources — not just a bank.

To best understand how a loan package works, the lawn and landscape maintenance specialist must know who he will be dealing with in his search for money. Making an appointment in advance will usually ensure that you deal with a bank officer.

It is obvious why the lawn and landscape maintenance specialist seeking funds for any purpose other than the most mundane will have a difficult time. After all, every lender is looking at the downside risk while the operator is looking at the upside potential — or should be. A lender is concerned with safety to a higher degree than an investor, but neither one wants to lose their money. So, the first key to any successful loan package is security for the funds that are requested.

The second factor is profitability to the lender or investor. Remember that the rate of fund profitability comes not only from the direct return, but also from fringe be-

nefits resulting from providing those funds.

A good example of this is provided by a banker who looks at a business loan as a way of creating a profitable customer for the bank. The discounted interest rate normally offered to bank customers is one example of the way bankers view loans. Surprisingly, the rate of return on the loan requested is not nearly as important as the future benefits that loan might create for the bank.

If the banker sees the lawn or landscape maintenance business as a growth situation where the account will get larger, he will take more of a chance than if it had little in the way of future prospects.

Even with investors, the same principle holds true. A "kicker" or other arrangement which gives an investor an opportunity to realize more than a basic dividend return will usually make obtaining funds from this source a great deal easier.

Now, in addition to spelling out the security that will be provided the lender/investor, the loan package allows the lawn and landscape maintenance specialist to remind the lender/investor of the future benefits that will follow if this proposition is approved. This information rarely has a place on a loan application.

Lenders are primarily interested in learning whether the borrowed funds can be repaid out of cash flow. Thus, including a cash flow projection in the loan package provides a quick answer to this question. No short-term lender, such as a banker, will put up funds that can only be repaid from profits. That is the field of the long-term lender or investor. The short-term lender wants his money from cash flow regardless of whether there are any profits.

When it comes to investors, it is usually understood that their returns come from profits, or from the sale of their holdings to others contemplating greater profits in the future. The loan package aimed at a lender will differ in the matter of repayment from that aimed at an investor.

Putting together a loan package with the help of an accountant or lawyer is relatively simple, and there is no one format that is better than any other. There are also a number of professionals who specialize in the preparation of such packages.

The final package will always address these three critical points:

SAFETY: A lender must be assured that his funds are safe. He wants to see collateral, co-signers, subordination of previous debt, etc. in order to assure the safety of his money.

PROFITABILITY: The lender is interested in the best rate of return on this loan — plus any future profits from dealings with the borrower. By showing the lender more income down the road, any borrower greatly increases his chances of getting the original loan.

REPAYMENT: Verifiable proof that the use of the funds will generate the necessary cash for repayment within the allotted time for the loan. The packages should contain an accurate use-of-funds statement as well as a projected cash flow statement showing how the use of the funds by the lawn and landscape operation will produce the necessary cash flow. These assumptions must be supported or backed-up with reasonable proof that can be verified from other competent sources.

With a loan package in hand, the landscaper can approach any banker with confidence that his or her request will receive the attention it deserves — even if the banker knows absolutely nothing about the lawn maintenance business. But, best of all, regardless of how exotic, unusual or risky, the landscaper is not limited to making his or her request to one bank or even a number of banks. — *Mark Battersby* ■

The author is a tax and financial adviser in Ardmore, Penn.

PRODUCTS

THE **CUSHMAN DIVISION** OF OUTboard Marine Corp. now offers the Cushman Core Destroyer™ attachment, designed for pulverizing aeration cores on sports turf, golf course fairways and T-boxes.

The new Cushman core destroyer mounts conveniently on Cushman front line® gas and diesel tractors. A dual hydraulic gear pump mounts directly to the tractor's PTO shaft and runs individual hydraulic motors on each of the two 30-inch reels.

Both reels are equipped with five-inch diameter reels with steel flail tines. Reels are easy to adjust for tine spacing. Reels operate at 3,500 rpm at 3,200 engine rpm, with the tine tips operating at 4,580 feet per minute (52.1 miles per hour).

Key features of the core destroyer's two flail reels are the flexible mounting links that permit two-axis float — side to side and fore and aft. Each reel is supported by a 2-inch wide gauge wheel on either end and a full-width rear roller.

101 on reader service card

PRODUCT SPOTLIGHT

DEMACO MANUFACTURing Group Ltd. recently introduced the Aqua-Sensor, a patented micro processor with a moisture analyzing probe. Using a 25-year proven industrial in-ground moisture analyzing probe that not only has the ability to be a "rain check," but allows the user to program from one to 40 watering stations plus or minus 2 percent of pre-selected moisture levels.

The in-ground probe analyzes the moisture content at root level no matter what the soil composition or above ground elements may be including humidity, outside temperatures and wind.

Aqua-Sensor's energy efficient micro processor and probe will save up to 60 percent water usage, and is virtually compatible to all types and brands of irrigation systems, including drip or emitter systems.

Because of it's user friendly micro processor, it is ideally suited for residential, commercial, sports turf, horticultural and agricultural needs.

Aqua-Sensor models can be programmed for special applications such as: automatic fertilizer, special berm hill settings, single station settings, greenhouse humidity management, all within plus or minus 2 percent of users pre-selected moisture requirements. All models come with a remote test-blow out and three- to five-year limited replacement warranty.

106 on reader service card

THE GRASSHOPPER CO. OFFERS time-cutting performance, lower maintenance and longer life with four new Gemini 700 Series Grasshopper outfront mowers. Each of the four models team the new Gemini high-performance direct drive hydrostatic system with a choice of reliable powerplants. The liquid-cooled or air-cooled engines, with gas or diesel power, range from 16.5-h.p. to 21-h.p.

A dual-lever control system puts instinctively natural control of steering, speed, turns, braking and forward/reverse at the operator's fingertips.

Grasshopper 700 Series tractors can be equipped with PTO-driven outfront decks ranging from 44 inches to 72 inches. The choice of engines includes: 18-h.p. Briggs & Stratton gas (718), 16.5-h.p. liquid-cooled diesel (718D), 18-h.p. Kohler gas (718K) or 21-h.p. liquid-cooled gas (721).
Circle 102 on reader service card

PROTURF® INSECTICIDE VI FROM **O.M. Scott & Sons** protects turf from the damage of white grub larvae (including Japanese beetle, masked chafer, European chafer and black turfgrass Ataenius) and sod webworms.

The product is said to be safe for use on Kentucky bluegrass, annual bluegrass, bentgrass, perennial ryegrass, fine fescue, tall fescue, St. Augustinegrass, bermudagrass or where mixtures of these grasses predominate when used as directed.
Circle 103 on reader service card

THE NEW **POULAN** PRO MODEL 175 is a pro-quality, straight-shaft trimmer with gear reduction that is designed to tackle tough weeds and grass with a minimum of effort. It has a two-cycle, 32cc rear-mount power head with a chrome-plated cylinder, two-ring piston and heavy-duty Precision Clutch™.

Pro Model 175

Special features include the exclusive SensorFeed® counterclockwise automatic line advance system, an 18-inch cutting path, a 500 cc fuel tank and easy carburetor access for service. The lightweight 13.4-pound unit comes with a throttle grip on the shaft and a cushioned assist handle. A twin-line cutting head is optional.
Circle 104 reader service card

THE HUSTLER 275 FROM **EXCEL INDUSTRIES** features a 23-h.p., air-cooled Kohler engine for reliability and extra power when cutting tall or wet grass. The fully pressurized lubrication system ensures continuous protection of critical engine parts for long service life.

Improvements for 1989 include new Ross ME high-torque motors with 1 3/8-inch shaft and an improved bearing for longer wear. A 10-micron filter replaces the 25-micron filter on the hydraulic system for better protection of the drive motors.

Hustler 275 accepts Excel's standard 72-inch deck, the 60-inch three-way deck or the 72-inch three-way deck. The heavy-duty welded frame is capable of supporting the Hi-Lift BAC-VAC grass catcher and the hydraulically controlled, side-mounted edger. Three winter attachments — the 54-inch snow blower; V-blade plow and 54-inch dozer blade — round out Hustler 275's year-round versatility. ■
Circle 105 on reader service card

CALENDAR

JULY 25
1989 Midwest Regional Field Day, Purdue Agronomy Farm, West Lafayette, Ind. Contact: Barb Meyer, 317/494-7221.

JULY 31 to AUG. 2
International Lawn, Garden and Power Equipment Expo, Kentucky Fair and Exposition Center, Louisville, Ky. Contact: Expo 89, P.O. Box 70465, Louisville, Ky. 40270; 800/558-8767.

SEPT. 20-22
1989 Nursery, Landscape & Equipment Expo, Atlantic City, N.J. Contact: New Jersey Nursery & Landscape Association, Building A, Suite 3, 65 S. Main St., Pennington, N.J. 08534; 609/737-0890.

OCT. 4-6
International Pesticide Applicators Association Annual Convention and Trade Show, Salishan Lodge, Glenden Beach, Ore. Contact: John Landon, P.O. Box 247, Clackamas, Ore. 97015; 503/222-3161.

OCT. 8-11
The Associated Landscape Contractors of America Interior Plantscape Division Conference and Trade Show, Boston Park Plaza, Boston, Mass. Contact: ALCA, 405 N. Washington St., Falls Church, Va. 22046; 703/241-4004.

NOV. 6-9
The 10th Annual Professional Lawn Care Association of America Conference and Trade Show, Las Vegas, Nev. Contact: Jim Brooks, 1000 Johnson Ferry Rd. N.E., Suite C-135, Marietta, Ga. 30068-2112; 404/977-5222 or 800/458-3466.

NOV. 7-10
New York State Turfgrass Association Annual Conference and Trade Show, Rochester Riverside Convention Center, Rochester, N.Y. Contact: Beth Seme, P.O. Box 612, Latham, N.Y. 12110; 518/783-1229.

NOV. 8-11
International Trade Fair for Design, Equipping & Care of Amenity Areas, Cologne, W. Germany. Participants include those interested in landscape construction, plants and seeds, chemical and biological products and golf course construction. Contact: Koln Messe, 221/821-2912.

NOV. 10-13
Green Team Conference and Trade Show, Cervantes Exposition Center, Omni Hotel, St. Louis, Mo. Contact: Associated Landscape Contractors of America, 703/241-4004 or Professional Grounds Management Society, 301/667-1833.

NOV. 28-30
Turfgrass and Ornamental Chemical Seminar, Purdue University, West Lafayette, Ind. Contact: Barb Meyer, 317/494-7221. ■

CLASSIFIEDS

RATES

All classified advertising is 55 cents per word. For box numbers, add $1 plus six words. All classified ads must be received by the publisher before the 10th of the month preceding publication and be accompanied by cash or money order covering full payment. Submit ads to: ALA Lawn and Landscape Maintenance magazine, 4012 Bridge Avenue, Cleveland, Ohio 44113.

ACQUISITIONS

WANTED TO ACQUIRE

Lawn care companies of all sizes in U.S. and Canada being sought by national corporation. Complete buy out or stay and grow with us. If interested please call me directly: Don Karnes, Senior Vice President, Tru Green Corp., 404/442-8700. Strict confidentiality maintained.

•••

WANTED TO BUY

Lawn care companies of all sizes anywhere in U.S. wanted to purchase by national corporation. If interested please respond to: *ALA/Maintenance,* Box 329, 4012 Bridge Ave., Cleveland, Ohio 44113. Strict confidentiality maintained.

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FOR SALE

LAWN CARE EQUIPMENT

Hannay reels new in-the-box, E1526s, E1530s, $349; lawn spray hose, 275 psi and 20 psi, all sizes; original Imler measuring wheels, $48; glycerin-filled gauges, 0-6 psi to 0-1,000 psi $19.95; polypropylene ball valves, 1/2-inch to 2-inch; ChemLawn guns, $75.95; lawn spray boots, $16.95; lawn spray gloves, $1.75-pair. **Call Hersch's Chemical Inc. 800/843-LAWN** — outside of Michigan **313/543-2200**

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BUSINESS FOR SALE

Lucrative landscape business with some large maintenance accounts. 5 trucks, trenchers, tons of equipment. Total price $75,000. 805/735-7076.

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LANDSCAPE TRAINING VIDEOS

Intermediate mower maintenance field and shop repair, efficient/profitable mowing techniques, professional shrub trimming, plant installation, basic landscape plan drawing, etc. ENGLISH AND SPANISH. Write for free brochure: C.D. Anderson Landscape Videos, 515 Ogden Ave., Downers Grove, Ill. 60515. 800/937-0399.

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EQUIPMENT AND CONSULTATION

Custom design sprayers; Professional spray consultation, Flo-jet 12-volt pump; Backpack sprayers; Hannay reels; JD9CT guns; Glycerin gauges; Spray System parts; Hypro and Udor pumps and replacement parts; High Pressure Cleaners. Selling directly to lawn care companies with discounts on parts and proudly shipping 90 percent of same day orders. **Canann Industries, 800/842-7515 (AL); 800/633-7560 (U.S.)**

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BUSINESS OPPORTUNITY

LAWN MAINTENANCE COMPANY

For Sale: Watt's Green Thumb. Residential landscape maintenance company. Owner retiring. Large list of accounts. All equipment, business and crews for $15,000 cash. Possible contract to experienced party. Interested parties call, 503/648-4427.

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HELP WANTED

FOREMAN POSITION

Top firm needs foreman. Quality conscious Texas-based landscape management firm has immediate opening for detail-oriented landscape maintenance foreman. If you have outstanding professional and horticultural skills and are not afraid of hard and healthy teamwork, then you could qualify for a top position with the finest landscape firm in the Southwest. Outstanding compensation and opportunity. Reply today to: *ALA/Maintenance,* Box 325, 4012 Bridge Ave., Cleveland, Ohio, 44113.

•••

GROUNDS MGMT. DEPARTMENT MGR.

Lied's Inc. established in Milwaukee, Wis., has outstanding opportunity for aggressive person to manage department. Management ability and horticultural background required. Send resume to Lied's Inc., Attn: R.B. Skelton, North 63 West 22039, Hwy. 74, Sussex, Wis. 53089; 414/246-6901.

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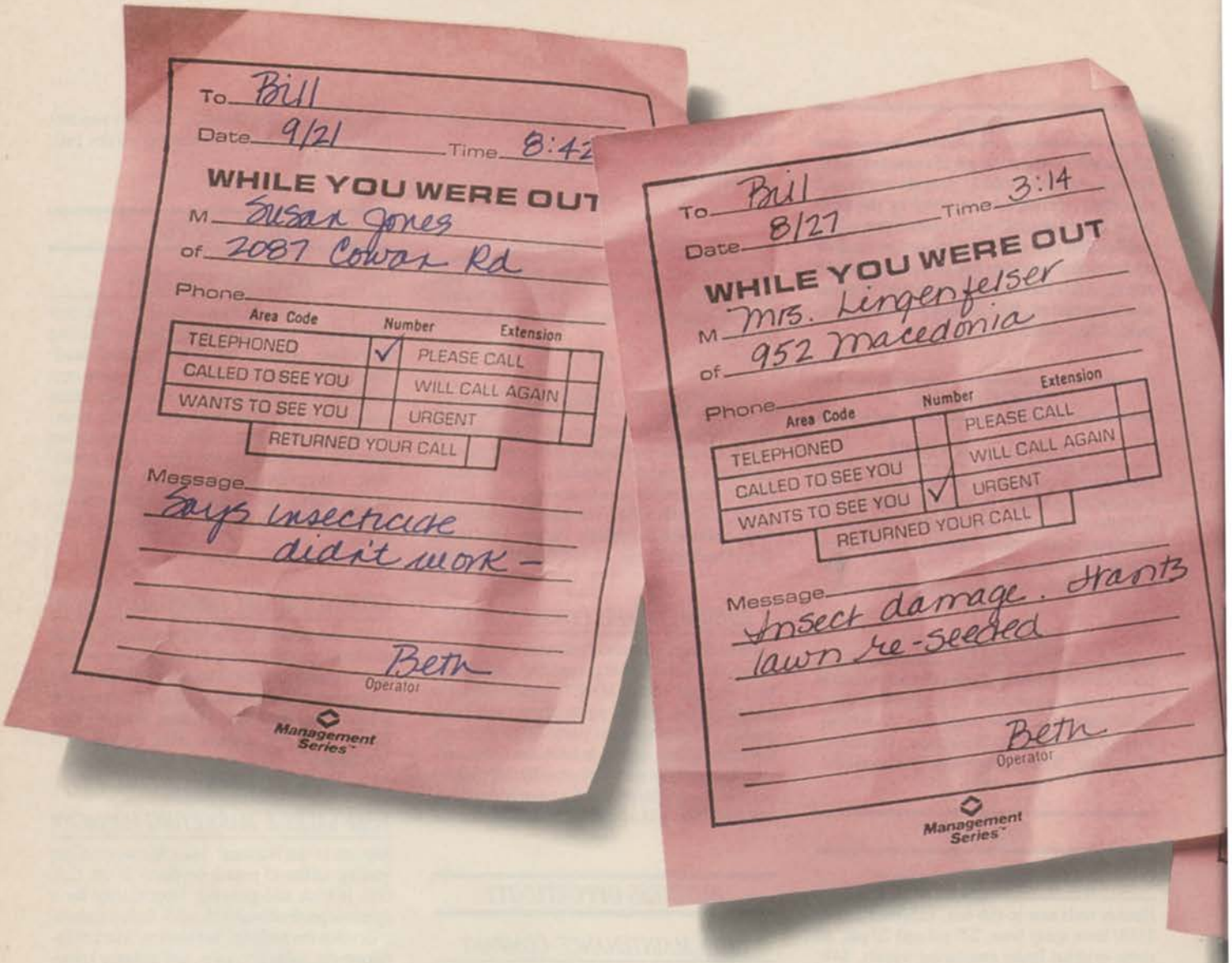
TURF SALES & MARKETING MANAGER

Reports to the National Sales Manager of the leading sulfate of potash producer in the U.S. GSL is back and growing. Opportunity for a dynamic professional with a B.S. in Agriculture to develop the national turf market. Market development, sales strengths, turf industry knowledge vital. Eastern U.S. Apply to: Julie Greenwald, Great Salt Lake Minerals, P.O. Box 1190, Ogden, Utah 84402. ■

ADVERTISER'S INDEX

** Depicts regional advertisement.*



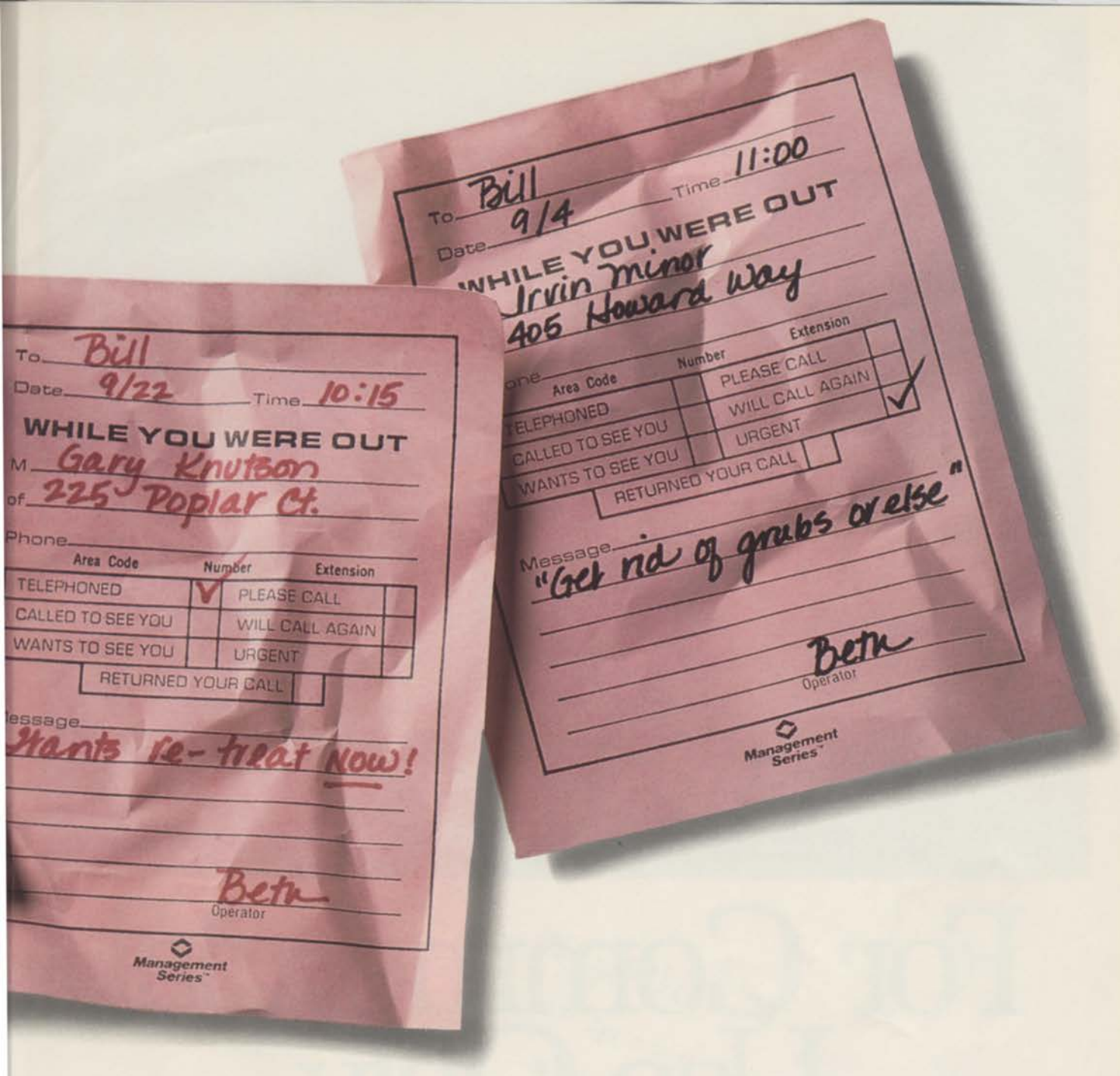
Triumph gets rid of the toughe

Constant callbacks and retreatments can drive even the best lawn care business right into the ground.

But you can reduce your callbacks —and increase your profits— simply by replacing whatever insecticide you've been using with Triumph®.

Because no other insecticide is proven more effective at controlling problem turf pests, including white grubs and mole crickets.

For example, in 10 years of university testing, Triumph has been shown to deliver



t turf pests, including these.

90 percent control of white grubs within just 2-3 days of application.

And, unlike other insecticides, Triumph consistently provides lasting control for a full 8-10 weeks. So one late summer or early fall application is all you need for effective turf protection.

Which doesn't mean you won't still collect notes from your clients.

Just that they'll more often be the green, negotiable variety.

sale to and use only by certified applicators or persons under their direct supervision, and only for those uses covered by the applicator certification.

Circle 30 on reader service card

For Commercial Use Only.

Most zero-turning-radius mowers are designed to serve both the consumer and commercial markets. At LESCO, we didn't do that.

We are pleased to introduce the first in a new line of mowers built exclusively for today's professional cutter. The LESCO 52 Commercial zero-turning-radius mower.

Features include an exclusive dual-articulating deck, allowing you to go where others simply can't. All-hydraulic traction-drive and a 20-horsepower engine deliver exceptional power and endurance. The optional LESCO-designed rear-discharge vacuum system collects up to eight bushels of clippings. And an innovative modular design permits easy servicing of all components.

The LESCO 52 Commercial features front-to-back and side-to-side deck articulation.

The LESCO 52 Commercial. Designed for productivity, reliability and you. To order or arrange for a demonstration, call us at (800) 825-3726 or stop by the nearest LESCO Service Center.

LESCO, Inc., 20005 Lake Road, Rocky River, OH 44116 (216) 333-9250

Circle 24 on reader service card