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**SPOTLIGHT
ON GOLF**

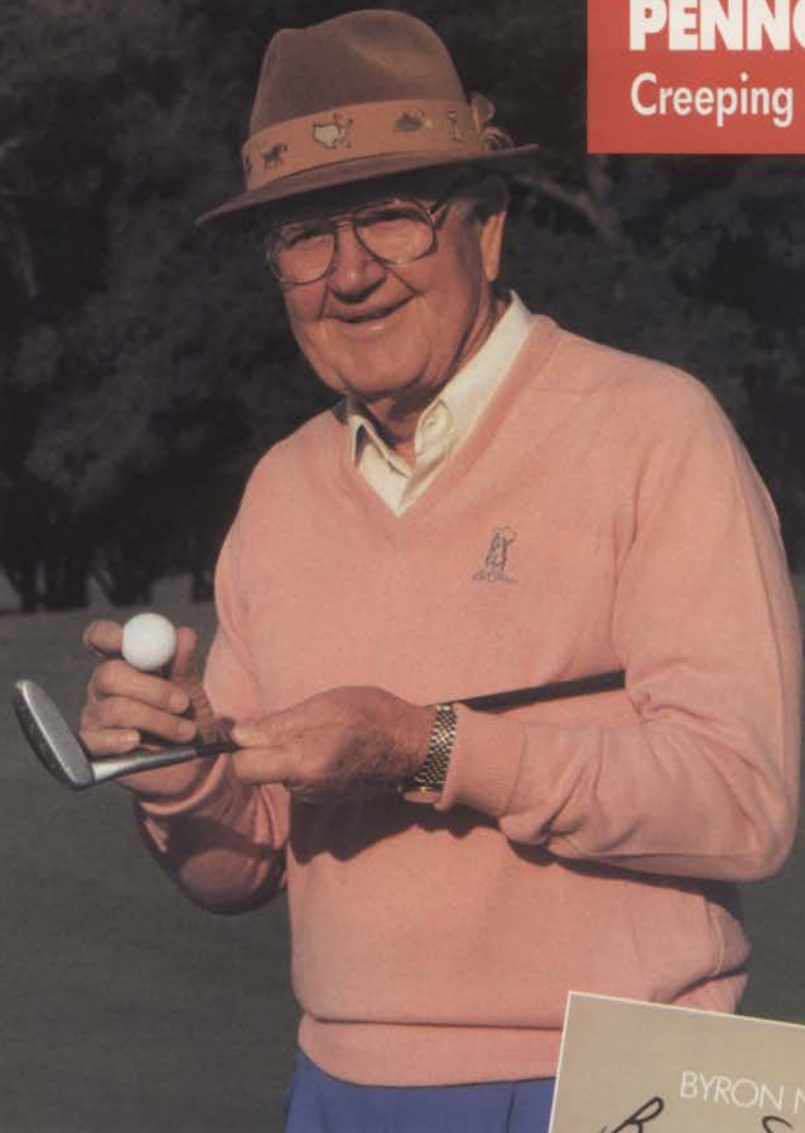
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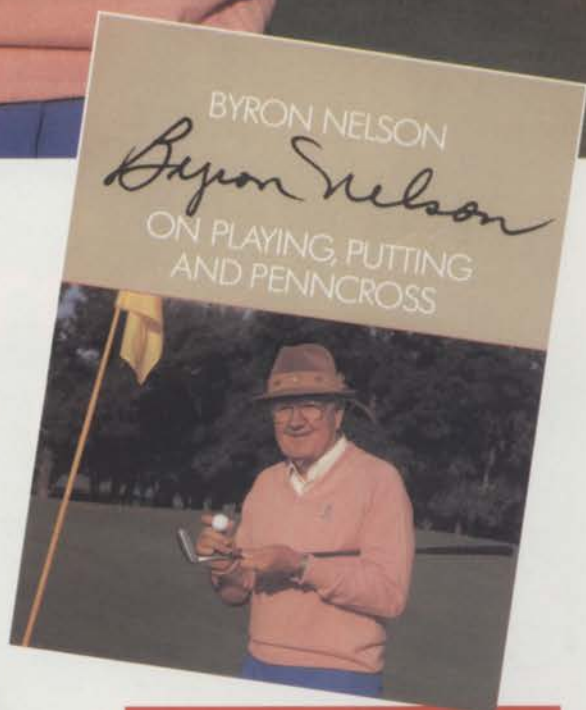
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LANDSCAPE MANAGEMENT

DEPARTMENTS

4 As I See It . . .

8 Green Industry News

12 Short Cuts

18 Athletic Turf

22 People

28 Letters

32 Events

74 Project Profile

88 Article Index

92 Research Update

94 Products

110 Classified

114 Ad Index

116 Problem Management

LM

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34

COVER: SPOTLIGHT ON GOLF.

In this issue we highlight golf course management, starting with Terry McIver's profile of D.J. Pakkala's role at the world-famous Pebble Beach courses. Managing roughs, calibrating sprayers and hydroseeding are also featured.



40 TOUGH ROUGHS

Does your golf course look a little rough around the edges? There's a way to polish that look, as proven by courses in Pittsburgh and Cleveland.

46 WHO CALIBRATES YOUR SPRAYERS?

by David Varner, Ph.D., and Robert Grisso, Ph.D. University of Nebraska researchers found that only one of six golf courses are accurately applying pesticides. What would they find at your course?

54 A COMPATIBLE PRACTICE

by Robert Stinson. Hydroseeding is becoming more and more popular with superintendents because it offers even, precise seed delivery and fast green-up.

60 BY THE LIGHT

by Jerry Roche. Landscapers on the cutting edge of the industry are beginning to offer nightlighting installation as a viable add-on service. Golf course superintendents are also taking advantage of the trend toward 24-hour beauty.

68 MATCHING BIDS WITH JOB COSTS

by Dick Landis. Northwest Landscape Industries has found that the best route to the land of high profits is through efficient estimating and job costing.

80 FIGURING THE COST OF FERTILIZER

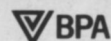
by Steve Cockerham. Simple mathematics can tell if you're wasting money by applying additional fertilizer.

86 USING DIRECT MAIL AS A MARKETING TOOL

by Ed Wandtke. A direct mailer may be one of the best marketing tools available to attract new customers in the landscape market.

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The better you are at controlling w

Strange, isn't it, that the better you are at something, the more difficult the hurdles become. Take grass and weed control in landscapes. The instant you lay waste to troublemakers such

as crabgrass and pigweed, you've really created a monster. Because a pristine landscape is where the dreaded yellow nutsedge grows best.

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eds, the more you need Pennant.

Pennant® herbicide is the exception. This preemergence herbicide controls annual grasses and weeds—including crabgrass and pigweed—for months. But, most importantly,

it also prevents any outbreak of yellow nutsedge.

All without stunting the ornamental plants that it's designed to protect.

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lems by using a lesser herbicide.

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Is it time to weed out drug users?

As we embark upon the 1990s, the green industry can feel confident of having made its voice known in the battle for fair pesticide application laws. Though regulatory problems continue, this start of a new decade could be the perfect time to take an industry-wide, active stance against drug abuse.

"One company can make a difference; many companies can have a major impact," says Jerry C. Moland of TurfScape Landscape Care, Chandler, Ariz.

Moland speaks from experience, having last summer begun a substance abuse program that includes the following policies:

- Prospective employees are required to submit to drug tests.
- Continuing employees are subject to random drug testing.
- A drug treatment program is available for interested employees.
- "Casual users" are no longer tolerated.

"Everybody in the industry is scared to death of losing people," Moland notes. "They're not sure how to deal with what could be a massive turnover. There were times I wavered, too."

Though eight good employees—one out of three—were initially lost, TurfScape's workforce has since grown from 24 to 30. And Moland is ecstatic with worker performance.

"All new employees possess better skill levels and more experience, and perform much higher quality work," he notes. "All are at TurfScape because of their desire to work in a drug-free environment."

There are other positive results of the company's new anti-drug policy: greatly reduced turnover, no accidents, no in-house thefts, no excessive damage to equipment, lower tardiness and absenteeism, good public relations.

And—oh yes—"the highest possible morale anyone in our industry could expect."

Moland sees this policy as a small though not insignificant step that could eventually help rid the country of its drug problems. "All small businesses working together can make a far bigger difference," he observes. "If users can't find work, they can't buy drugs. If the customers dwindle, watch the dealers go away."

TurfScape's credo, not surprisingly, is "TurfScape Truly Cares."

Do you?

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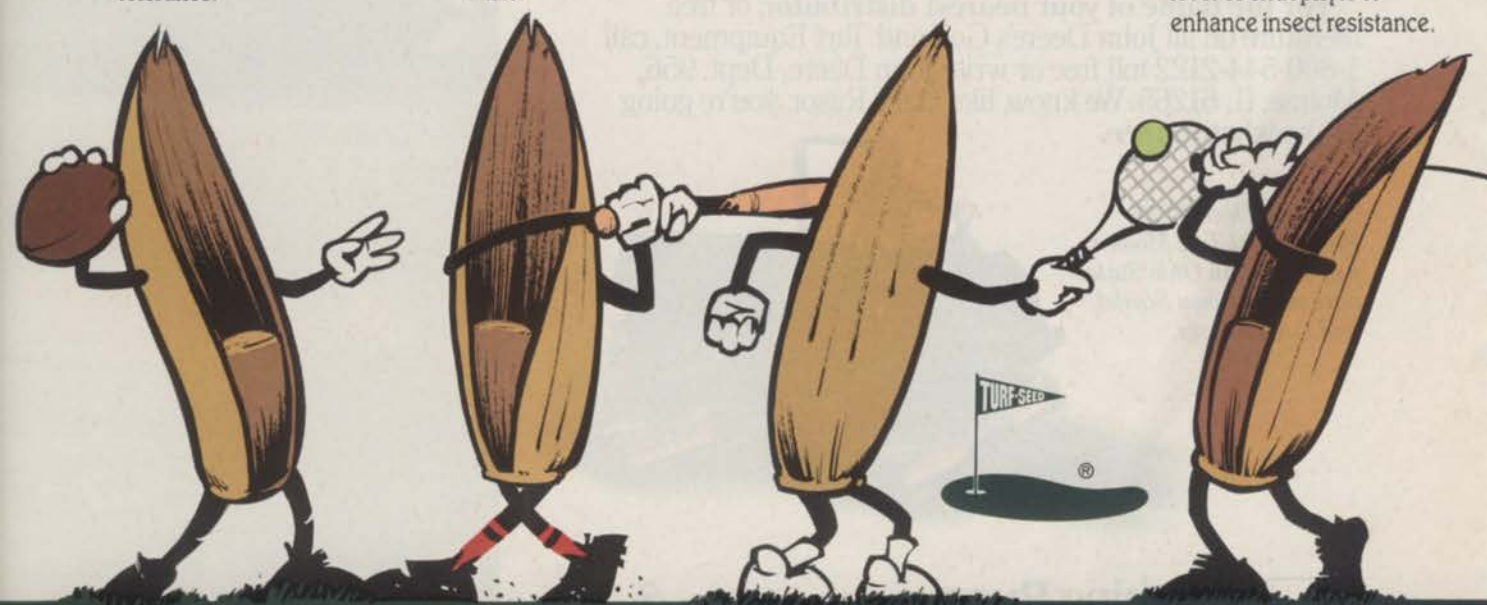
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Chalk up two more All-Americans for Ohio State

Golf traditions run deep at The Ohio State University. Its two 18-hole courses were designed by famous golf course architect Alister MacKenzie in the 1920s. Since then, they've challenged All-Americans like Jack Nicklaus and Tom Weiskopf, and today are recognized as two of the premier collegiate tracts in the country.

Gary Rasor is responsible for maintaining these courses. A job he's done with pride since graduating from Ohio State over 20 years ago. Last year, Rasor's equipment line got a big boost with the addition of another American standout—a John Deere 3325 Professional Turf Mower.

"We wanted a high-quality, high-volume mower that could collect clippings," says Rasor. "We bought our first 3325 after seeing it here on demo and have been so impressed with its performance that we've gotten a second one since."

"The full-sized center grass catcher has been a real advantage because we have to mow 36 holes, and not having to stop as often to empty that center basket saves us a lot of time."

"The weight transfer feature has also been important. There are three or four holes on each course where we couldn't mow without it. It really makes a difference on hills."

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GREEN INDUSTRY NEWS

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GREEN INDUSTRY NEWS

JANUARY 1990, VOLUME 29, NUMBER 1

LANDSCAPE MANAGEMENT

CONVENTIONS

GCSAA honors Bengueyfield and Watschke at its show



ORLANDO, Fla. — USGA Green Section national director William Bengueyfield and Dr. Tom Watschke, Penn State University turfgrass researcher and educator, have won the GCSAA's 1990 Distinguished Service Awards.

The awards will be presented at the opening session of the 61st annual International Golf Course Conference and Show here next month.

Under Bengueyfield's leadership, the USGA/GCSAA Turfgrass Research Committee has seen more than \$2.8 million raised and distributed for research to develop turfgrass cultivars that will reduce water usage and maintenance costs. A long-time GCSAA member, Bengueyfield also operates Frankfort Golf Course in Frankfort, Mich. He served as editor of *Green Section Record* for 20 years.

Watschke is coordinator for Penn State's Landscape Management and Water Quality Research Center,

synchronizing all field research for the five departments that cooperatively use the facility. His research has led to the use of growth regulators for *Poa annua* control, the development of new post-emergence crabgrass control compounds, advancement in broadleaf weed controls and, most recently, toward a better understanding of surface runoff on turfgrass.

Spotlight on...

The conference itself will explore the environmental impact of golf courses. It will feature seminars, speakers and forums for the more than 15,000 expected superintendents to enhance their understanding of environmental management.

Some of the environmental topics to be discussed are: water quality and conservation; integrated pest management; hazard communication; underground petroleum tanks; and the storage, dis-

posal and recycling of chemicals. Expert presentations on these and other topics will be made during the Friday session on "Managing Today's Environment."

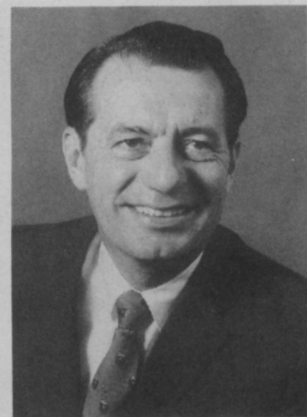
A special government relations forum will also be held at the conference. Attended by GCSAA members, federal regulatory officials and leading scientific researchers, the forum will detail ways to monitor regulation and inform and educate government personnel on the day-to-day management practices at golf courses.

Officer election

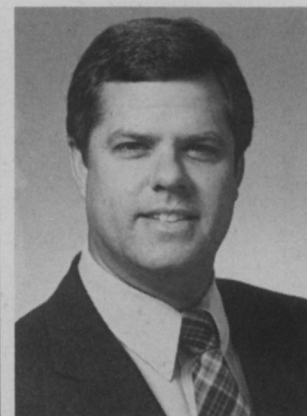
The GCSAA will also elect officers and directors at the show. Gerald L. Faubel has been nominated for the presidency in 1990-1991. He is superintendent at Saginaw Country Club, Saginaw, Mich. He currently serves as the organization's vice president.

Vice presidential candidates are Stephen G. Cadenelli of the Metecunk National Golf Club in Jackson, N.J., and William R. Roberts of the Lochmoor Club in Grosse Pointe Woods, Mich.

Three candidates for director will be elected for two-year terms. Nominees are Joseph G. Baidy of Acacia Country Club in



William Bengueyfield



Dr. Tom Watschke

Lyndhurst, Ohio; Charles A. Clark of Broadmoor Golf Course in Colorado Springs, Col.; Cecil C. Johnston of Avila Golf and Country Club Hyannisport, Mass.; and Randall P. Zidik of Rolling Hills Country Club in McMurray, Pa.

For more information on attending the event, contact the GCSAA at (913) 841-2240. □

ASSOCIATIONS

ALCA picks Dennis from its own staff

FALLS CHURCH, Va. — Debra Dennis has been promoted to executive director of the Associated Landscape Contractors of America (ALCA). She was chosen by a thorough and highly competitive process, according to ALCA president Ron Kujawa.

"We narrowed the final list to four outstanding candidates," notes Kujawa. "Debra Dennis went into the race as a darkhorse at best, but she just stood out. She emerged as very strong, energetic and competitive, and was a strong unanimous choice."

Interviews with the four finalists were conducted by a seven-person search committee at the Green Team Conference in St. Louis. Each interview lasted no

less than two hours.

"Most organizations would take an easy way out. We didn't," says Kujawa. "The membership expended a great deal of time and personal effort on behalf of the organization."

During her 10 years with ALCA, Dennis has served in a variety of positions, most recently as staff liaison to six association committees.

The new executive director is a 1979 graduate of the University of Georgia. One of her first goals will be to build on ALCA programs and services for the membership, ultimately leading to an improved image for landscape contractors.

"If we strive to improve the image, it can only help bring more people into the



Dennis: Improve image

profession," the new director believes.

Dennis's selection as successor to Terry Peters will signal new directions for the organization. "We're doing some re-organization and we've got some exciting plans," Kujawa says. "Our key people have agreed to stay. They and our state association councils are very excited." □

LANDSCAPING

'No wildflowers,' neighbors tell Cleveland man

SHAKER HTS., Ohio — A dispute began in this affluent Cleveland suburb recently over a man's decision to turn his front yard into a wildflower lawn.

Joseph Gyurgyik, owner of Shaker Landscaping, seeded his 12,500 sq. ft. yard in the spring with cosmos, poppies, black-eyed Susans and about 75 other species, both annual and perennial. Some of his neighbors are now complaining that the yard is an eyesore, will draw rodents and spread to other yards via airborne seeds.

In response to complaints, city officials are moving to more clearly define a zoning law that calls for "appropriate" landscaping. However, as of November 18, they were unable to devise an appropriate ruling, simply because many groomed yards contain at least a few of the unwanted plantings.

Councilman David Goss and other officials say Gyurgyik's yard is not appropriate, but they're not sure why.

"You know this yard is bad when you see it, but the question is where to draw the line," says Mayor Stephen Alfred.

"I don't think they're going to be able to come to a compromise," predicts Gyurgyik. "They might outlaw the flowers I have in my front yard, but then half of Shaker Heights (homeowners) will be in violation."

Gyurgyik says he has received compliments about his yard from some neighbors who think it is something new and different. The local paper also ran a few letters from persons who see nothing wrong with Gyurgyik's plant selection.

Gyurgyik says he will appeal any zoning order not in his favor. □

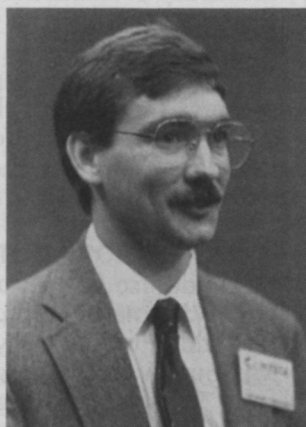
REGULATIONS

On local compliance: going that extra yard

ROCHESTER, N.Y. — Pesticide regulations will continue to be a problem for professional landscapers. They'll have a better go of it if they understand and comply with that legislation, become more politically involved, support product research and follow integrated pest management (IPM) practices.

That's the advice of James Wilmott, extension agent for New York's Monroe County, speaking at the recent New York State Turfgrass Association meeting here.

"There are more situations occurring," says Wilmott, "in which landscape managers have been told by administrators to stop using pesticides entirely. In less extreme cases, people have been



Wilmott: Diplomacy works

told they can use pesticides only when they are needed."

To best understand state and local laws, Wilmott suggests meetings with local enforcement officials as the best way to establish both a personal and profes-

sional relationship.

"This shows you have a willingness to comply," says Wilmott. "And, the officer is probably going to take it much more lightly if you have some small violation of regulations. It's good to establish that relationship."

Wilmott believes political involvement has kept the legislators at bay to a great degree. "Imagine," he says, "where we'd be now if it weren't for groups like the Green Council, NYSTA, or the GCSAA." Lack of industry defense strategies would have left companies open to the hurricane-like force of unbridled legislation.

Wilmott says Integrated Pest Management (IPM) practices "are being en-

continued on page 12

IPM from page 11
 couraged more often in school districts and other properties around New York State. Keep your superiors informed, maximize pest-tolerant landscape design and encourage plant

health through use of IPM procedures.

"There is no question," he says, "that regulation of pesticides will be the dominant feature in your neighborhoods. IPM is the answer to the problem." □



The Scandinavians began their tour at Jacobsen headquarters in Racine, Wisc. and at the University of Minnesota.

GOLF

Scandinavian supers visit U.S. courses

RACINE, Wisc. — More than 90 golf course superintendents from Europe's Scandinavian countries recently toured the United States, thanks to the European distributor for U.S. equipment manufacturer Jacobsen Division of Textron.

After a stop at Jacobsen and the University of Minnesota, the group then flew to Miami and Orlando, Fla. During that portion of the trip, the supers played golf at Doral Country Club's Gold Course and the new

course at Grand Cypress.

During their trip, the superintendents also got a close-up look at maintenance techniques used by their North American counterparts.

"The purpose of this trip was to educate the Scandinavians on what's being done in the United States," says Neils-Erik Brems, who distributes Jacobsen products in Denmark. "They can then go back and educate their boards of directors or greens committees on what can be done to improve their courses."

Sweden alone has an estimated 200,000 golfers, Brems says. And the number of courses in Denmark is expected to jump from 60 to 100 by the year 2000. □

SHORT CUTS

ALL-PRO SOD...Evergreen Sod Farm in Peotone, Ill. has two All-Pros on its side, according to one of its print advertisements: Boss 111 bluegrass sod blend and Chicago Bears all-pro strong safety **Dave Duerson**. Evergreen vice president **Dean Hupe** met Duerson's agent on a plane trip, says Evergreen office and sales manager **Linda LeSage**. Hupe offered Duerson free sod for his new home north of Chicago in return for his cooperation with the ad. "Dave is a super person, very down to earth," relates LeSage, who with her son has visited Duerson's home a few times. Evergreen grows sod for Wrigley Field, Comiskey Park and Milwaukee County Stadium. The company is also growing sod for the Chicago White Sox' new stadium.

MULTI-LINGUAL...Dr. Alex Shigo is enjoying international success with his tree books, he tells **LANDSCAPE MANAGEMENT**. His "New Tree Health," a 12-page booklet with 13 full-color drawings, is now available in English, Dutch, French, Italian and Spanish. Those (\$3 each), plus his new 192-page book "Tree Pruning, a Worldwide Photo Guide" (\$39), are available from Shigo & Trees Associates, 4 Denbow Rd., Durham, NH 03824. Shigo says his next project is a 12-page folding booklet called "Caring for Young Trees From Nurseries to Landscapes."

LYME DISEASE LINGERS...The reality of continued Lyme disease problems remains, notes **Walter Shroeder** of the New York State Pesticide Applicators Association. "I would advise that everyone develop a strategy of dealing with it," writes Shroeder. "There has been a multitude of incidents where the Lyme disease tick was transported into the city by child, adult or pet, after a jaunt in the woods." Shroeder believes virtually all rodents can serve as the host for the bacteria, not just the deer mouse. "In California, it was found that lizards can serve as a host for the spirochete for a disease similar to Lyme disease."

HITTING ROCK BOTTOM...Public regard for pesticide use has hit an all-time low, said Dr. **Jim Wilkinson**, executive director of the Pesticide Public Policy Foundation at a recent Missouri Valley Turfgrass Association meeting. "Those of us using pesticides for non-agricultural purposes are going to face even greater challenges down the road. Environmental groups know they can use the pesticide issue to their financial advantage." Wilkinson sees stormy weather ahead as the EPA finishes its national survey of pesticide residues in well water, expands endangered species and wildlife protection regulation, and as landfills near capacity.

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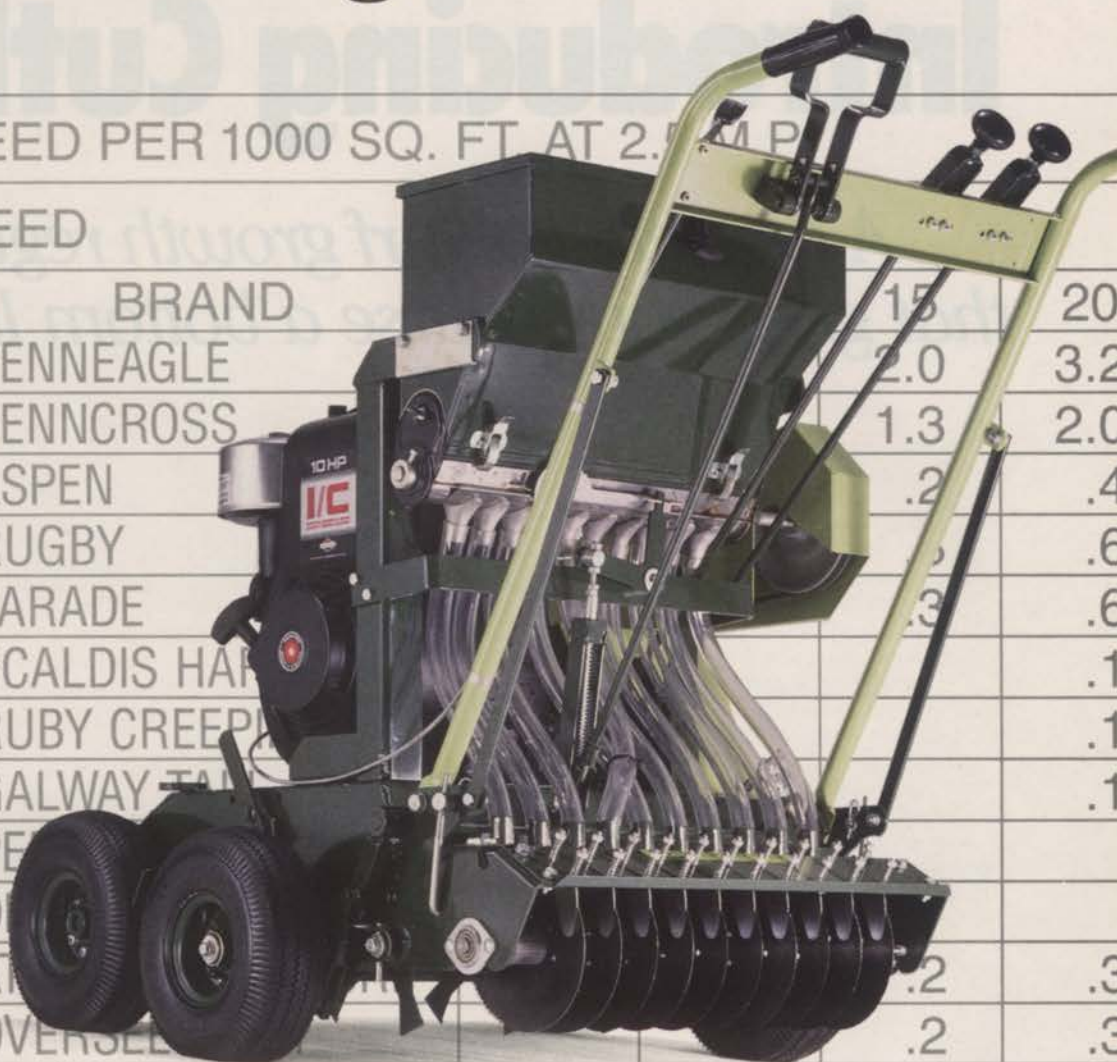
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	PARADE	.2	.6
FESCUE	SCALDIS HAI	.3	.6
	RUBY CREEP		.1
	GALWAY TAI		.1
RYEGRASS PERENNIAL	PE		
	DE		
MIXTURE	AT	.2	.3
	OVERSEED	.2	.3



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Unlike other turf growth regulators, new Cutless doesn't stop the development of warm and cool season turfgrass. Instead, it

reduces or slows your turfgrass's growth rate by shortening the internodes of the growth stem with no adverse effects on their roots. The result is improved turf quality and more playable fairways.

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Cutless also reduces your water use, resulting in less turf wilt. And lower irrigation costs.

But Cutless does more than that. Much more. It also gives your turf a rich, darker green color.



Because Cutless-treated grass grows at a slower rate, there's also a dramatic reduction in clippings. Up to 50% less. With less mowing frequency. Also up to 50% less. You not only save time and labor costs, you

can also manage your hard-to-mow areas more efficiently.

Here's another added benefit with Cutless. As your turfgrass grows up thicker and more competitive, there's less room for troublesome weeds to interfere. Cutless also helps crowd out *Poa annua* for conversion to a more desirable turfgrass such as bentgrass.



1. Sprig of grass in normal state.
2. Seven to 10 days after Cutless application, mowed sprig sometimes exhibits slight discoloration of treated area and leaf tip browning.
3. Growth reduction peaks between third and eighth weeks, accompanied by darker green coloration and increased tillering.

Don't just take our word for Cutless. Take it from Scott Niven:



Scott Niven
Superintendent, Stanwich Club
Greenwich, Conn.

"I've reduced clippings 30 to 50% when we mow fairways. My guys don't have to empty the baskets as much, so we save time and money on labor. But I think the best advantage is the reduction in the amount of water you have using Cutless. It's a marked difference."

"Initially, you get so little discoloration with Cutless that a golfer would never notice it. But after 4 weeks, the difference was between night and day on how dark green the Cutless turf was."

"Cutless helped us convert from 80% Poa annua to over 95% bentgrass within five years. But I'm just as impressed with how Cutless creates a much thicker turf. It makes the grass as tough as nails, helps the ball sit up higher for our golfers."

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Circle No. 110 on Reader Inquiry Card

CONFERENCES

Green Team's final bow draws 450 landscapers

ST. LOUIS — The Green Team Conference and Trade Show bowed out of its current format last November by attracting 450 landscape and grounds managers.

Starting this year, the Green Team event joins the Professional Lawn Care Association of America's show to become the Green Industry Expo.

Highlights were the annual "Breakfast of Champions" and well-attended addresses by Dr. Dayna Waitley, Dr. Alex Shigo and Frank Ross.

The Associated Landscape Contractors of America presented Environmental Improvement Awards, and more than 70 companies participated in the trade show.

Two special President's Awards were presented by the Professional Grounds

Management Society: to Anne Seaman for dedicated service and to the Missouri Botanic Garden for horticultural excellence.

The Landscape Manager of the Year award, co-sponsored by the PGMS and LANDSCAPE MANAGEMENT magazine, was given to Morris L. Martin, vice president of the Landscape Division at the Alfred L. Simpson Co., Atlanta, Ga.

Elected as PGMS officers were: president Ted Shull of Kettering (Ohio) Medical Center; first vice president Tom Smith of Spring Grove Cemetery, Cincinnati; second vice president John Abernethy Jr. of Lenoir (N.C.) cemeteries, and treasurer John Michalko of Case Western Reserve University, Cleveland.

Directors elected were Doyle Watson of Belle Meade Country Club,



Deere champions

Golf course superintendent Toby Strahan was on the winning team from the Country Club of Louisiana at John Deere's team golf championship held at PGA West, Palm Springs, late last year. Members of the winning team were (from left) Deere distributor Howard Ruiz of Sunshine Equipment, Strahan, club president Ben Skillman, club manager Luis Romero and PGA pro Dean Alexander. Each amateur won a championship ring and \$100 gift certificate.

Nashville, Tenn.; Larry Ward of the Medical College of Georgia, Augusta

and Paul Thomas of Towson (Md.) State University. □



Stanford Seed

PRODUCTS

Green industry gets insecticide

MIDLAND, Mich. — Pageant DF, the green industry's first dry flowable insecticide, has received EPA approval. It is available for sale next month, according to sources at DowElanco here.

"Pageant DF is a unique broad-spectrum tree and shrub insecticide differentiated by its excellent activity on worms, scale and aphids," says marketing manager Rob Peterson.

Pageant DF was specifically formulated for the tree and shrub care market. It combines water-dispersible granule technology with convenient, disposable packaging. This formulation offers improved handling benefits: less dust, less residue in the container, excellent pourability, easy measuring, less applicator exposure and minimal agitation.

"It has all the features



needed for the '90s," Peterson says. □

Corrections

Two errors appeared in October's "Pocket Guide to Landscape Management" in the cool-season weed control section.

On page 11, Dow's Turflon (triclopyr) is mis-labelled Garlon. On page 9, methyl bromide is branded Dowfume, which is no longer available to the landscape market. In addition, Tordon (picloram) should not be included, but Confront (clopyralid/

LANDSCAPING

Michigan giants merge companies

PONTIAC, Mich. — Reinhold Landscape and Vidosh Inc. have merged to become Reinhold & Vidosh, Michigan's largest professional landscape service and supplier.

"Reinhold Landscape has always been committed



Sawka Vidosh

to improving," says Melanie Reinhold Sawka, president of Reinhold & Vidosh. "We believe our merger will strengthen our services while maintaining the same standards of excellence that have distinguished our company for over half a century."

Operations will expand to regional office locations in Michigan, Tennessee and Florida. The new company will retain all current levels of staff and managerial positions.

"That we are our own primary source of landscape materials, equipment and management guarantees our ability to operate on an unprecedented national level," says chairman Donn Vidosh. □

triclopyr) and Acclaim (fenxaprop-ethyl) should be.

LANDSCAPE MANAGEMENT apologizes for any inconvenience these inadvertent errors caused.

Finally, our October article on Minute Grass listed only an address in France. Cancel your passport applications—we now have the address of the U.S. supplier of the pre-grown grass: 11685 Ventura Boulevard, Studio City, CA 91604; (818) 766-2661 or (213) 877-0864. □



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ATHLETIC TURF

Are you professional?

We all talk about being professionals. Don Marshall, director of golf and stadium operations for the city of Anaheim, Calif., wonders how often professionalism is truly practiced in the athletic turf and golf industries.

Speaking at the New York State Turfgrass Association exposition in Rochester, N.Y., Marshall fired a few well-aimed salvos at what he thinks is a lack of true professionalism in the green industry.

According to Marshall, this deficit is caused by a number of trends:

- Product endorsements;

- So-called "consultants" who accept payment for imparting the most basic turf knowledge; and

- The bias that Marshall believes exists toward veteran turf professionals who have never received GCSAA certification or similar scholastic honors.

"My generation," explains Marshall, "has nothing upon which to hang our careers other than hard work applied to the best of our ability in a professional manner."

"Being high profile or putting out a great public relations spin will not create the professional," says Marshall. "Such may serve to hide a few inept ones for a while but it is not a solution to an image problem. In many ways it accentuates it."

Marshall admits that sports turf management is far from being an exact science. But regardless of all the degrees or permits a person might have, "you use your own knowledge base to make the best possible judgement, including asking for qualified help when you're indecisive. If you expand this knowledge base and exercise an honest work ethic, I say you make it as a professional."

Payment for consultation is wrong, asserts Marshall, "when the knowledge (the consultant is) imparting is so basic, it is in the public domain," and "when (the consultant is) using (his or her) position for personal gain rather than that of the employer."

"How many times have you run into a situation in which a consultant comes in and lists six pieces of equipment that are needed? Now it becomes important, and suddenly the equipment appears. But the poor super operating the place has asked for it for years," Marshall observes.

"There will always be a few of us who—by virtue of our coincidental successes and personalities—will become a head above the rest in the public eye," concludes Marshall. "They shall be recognized as outstanding in their fields. The rest of us will be happiest by merely standing out in our fields."



Don Marshall

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To maximize life and minimize maintenance, the Bunton 61" cutter deck and power unit are built with reinforced heavy-



assures that the transmission is in the selected gear. A simple toggle switch raises and lowers the cutting deck from the operator's seat for clearing curbs and easy maintenance.

The American made 18 hp Onan engine option makes the perfect combination for long life and reliable performance. It has fully pressurized lubrication and made in America serviceability.



duty, 10 gauge steel. The positive chain steering system and electric cutter deck lift eliminate the maintenance costs and problems of cables and hydraulic systems.

The superior Peerless transaxle has five forward ground speeds and reverse, with a unique shift linkage that

automatically declutches the transmission to "shift-on-the-go" without causing wear to the shift keys and gears.

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This advance generation turf-type perennial ryegrass is setting new standards for quality, color, and performance. Its dark green color, fine leaf texture, and environmental tolerance gives you beautiful and functional results, while its high seed count stretches your grass seed dollar. Use Fiesta II straight or in Futura 2000 where it is blended with Blazer II and Dasher II perennial ryegrasses. A genetically superior combination for perennial turf in the North and overseeding in the South.

Banff

Kentucky Bluegrass

Banff is a vigorous dwarf variety that was discovered on the Banff Springs Golf Course in Alberta, Canada. There, Banff survived twenty years of continual heavy watering, repeated attacks from snow mold, and close mowing on a putting green. Just imagine what it could do for you. Banff establishes quickly and forms a disease resistant, cold tolerant, dark green turf.

Touchdown

KENTUCKY BLUEGRASS

Since Touchdown's discovery by the late Tom Rewinsky on the National Golf Links of America on Long Island, this elite bluegrass has become the top choice of sod producers. Its aggressive growth habit and rapid establishment crowds out weeds and Poa annua while developing an even, dark green turf.



Mustang is the tall fescue that looks like bluegrass. Its finer texture, darker green color, and wear and drought tolerance have made it the choice for sports field, sod, park, and home lawn use. Mustang is available straight or in TEAM – a three-way turf-type tall fescue blend that also contains Maverick II and Thoroughbred.



Colt is an Oregon produced variety that offers you domestic seed production benefits. It combines superior turf performance and turf quality with genetic adaptation to North American growing conditions. It is dark green, shade tolerant, disease resistant, and very winter hardy. Colt is a vigorous, low-growing variety that has excellent overseeding qualities.



For the fourth consecutive year Victory was the highest rated commercially available chewings fescue in the national Fine Fescue Trials. Victory is a low growing, shade tolerant variety that has possibly the darkest green color of any other chewings fescue. It exhibits superior uniformity and disease resistance, too. If you like picking winners, pick Victory.

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ty of reasons.



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Crossfire turf-type tall fescue is the only strategy you need for battling a summer ambush of heat and drought. Crossfire is a lower and slower growing variety of tall fescue that exhibits a very dark green color. It combines improved heat and drought tolerance with outstanding turf quality to produce a dense and durable turf. Crossfire's high marks in overall performance during its initial evaluation proved it was ready for the field. Let Crossfire show you how to endure a long summer siege.

SPARTAN HARD FESCUE

Spartan is a robust, advanced generation of hard fescue that is dark green, leafy, and persistent. It demonstrates excellent cold tolerance and creates attractive, low growing, low maintenance turf. Spartan mixes well with perennial ryegrass, Kentucky bluegrass, and other fine fescues. It is an outstanding component in many shady and low maintenance mixes suited for use on home lawns, parks, and golf course roughs.

AMERICA KENTUCKY BLUEGRASS

America is a low maintenance Kentucky bluegrass that has a dense dwarf growth habit, dark green color, excellent disease resistance, and good shade tolerance. Perfect in mixes, America is ideal for golf course fairways, sod production, playing fields, and home lawns.

Pickseed also produces the following quality turfgrass varieties: Agram chewing fescue, Jasper creeping red fescue, Jazz perennial ryegrass, Alpine Kentucky bluegrass, Exeter colonial bentgrass, and National creeping bentgrass.

SHORTSTOP TURF-TYPE TALL FESCUE



Shortstop is the little guy with big benefits. As its name implies, Shortstop is a slower and shorter growing variety of turf-type tall fescue. But don't let its stature fool you. Shortstop is plenty tough. It has heat and cold tolerance, disease resistance and is widely adapted. Shortstop forms a beautiful, dense, uniform turf of finer, darker green leaves.

BRONCO Kentucky Bluegrass

Bronco is a very wide bladed Kentucky bluegrass that was developed specifically as a mix companion for turf-type tall fescue. While its texture and color gives it the appearance of a tall fescue, the comparison between the two ends there. Bronco is elite Kentucky bluegrass all the way. Its been bred to be less dense so it won't crowd out tall fescue and yet still aggressive enough to fill in and repair damaged areas quickly. That's what makes Bronco ideal for sports turf use.

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Believing in his own people

MURRYSVILLE, Pa. — Irrigation expert Tamas (Tom) Tanto thinks that having the right people in the right place at the right time is vital.

"We feel it is very important to take our own employees to out-of-town jobs, and not hire local people there," he explains. "We might have one inexperienced person in an eight-man crew, but he's from our home base and we're training him. Most of our crews have been together for a long time. They work long hours—seven days a week to meet the deadlines—and they do quality work."

Some irrigation organizations send out two or three experienced people, and then hire locally to fill out the crew. But often they find it difficult to get on-site



Tamas "Tom" Tanto (right) confers with David Alexandrowicz, superintendent at St. Clair C.C. in Venetia, Pa.

help of any kind. And they face the problem, right after payday and as a project winds down, that some local help will not show up.

Tanto's company installs irrigation systems for Arnold Palmer, Jack Nick-

laus, Reese Jones, Robert Trent Jones and other top golf course designers. It also re-does irrigation on top-notch, well-known existing courses.

Tanto's 67 employees restrict themselves to an area

extending from Maine to Florida, and from the Atlantic Ocean to Ohio. They work hard to keep on top of 20 to 25 concurrent projects.

Tanto, a 1956 Hungarian refugee who earned a civil engineering degree from the University of Pittsburgh, built complete golf courses until 1974. Then the energy crisis convinced him he should concentrate on irrigation, the least energy-dependent and his favorite phase.

How does he keep up with the fast pace he's set for himself?

"It takes a combination of things," he says. "Good people, good equipment, a commitment to finishing jobs right and on time...it's a matter of putting several pieces of a puzzle together."

Tanto has found it im-
to page 26

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Chipco® Sevimol® is a special liquid formulation of Sevin® brand carbaryl insecticide for broad spectrum defense against grubs, sod webworms, chinch bugs, bluegrass billbugs, mole crickets and more than two dozen other turf pests. Chipco®



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PEOPLE from page 22
portant to use reliable trenching and vibratory plowing equipment, which can be maintained by distributors wherever he goes. After trying a bit of everything, he has settled on Ditch Witch: six 30 hp trenchers and one 65 hp trencher, along with five 35 hp lawn plows and various attachments, including two earth saws.

"We expect to get 2,000 feet a day out of each machine and crew," says Tanto. "Usually, we run only one machine at a time on a job. Trenching is normally finished by noon, and the whole day is spent laying pipe."

Tanto also recently acquired a Ditch Witch P40

rod pusher, specifically for a course whose manager would not allow him to saw across roads and cart paths. It's "smaller and lighter than any rod pushers we've used before," he says.

Tanto himself visits all job sites frequently, discussing needs with course officials and making sure their schedules are being met. His "normal" 18-hole irrigation job on a new course takes about 60 days.

What about the future? The demand for new golf courses is increasing almost exponentially, and competent irrigation companies are getting busier. What once was a seasonal activity has become a fast-paced, year-round, high-tech activity for dedicated people like Tanto and his crews.



Paul Thomas (left) and Joe Ardolino were responsible for renovating the baseball field at Towson State University.

Towson's renovation: using all the resources

BALTIMORE — When East Coast Conference officials decided that Towson State's baseball team couldn't play on its home field if it qualified for post-season play, Paul Thomas and Joe Ardolino knew it was time to renovate.

Thomas is grounds supervisor and Ardolino assistant athletic director at this small suburban college. Together they transformed the school's baseball stadium from censure to championship quality, as evidenced by the Beam Clay College Diamond Award won last year.

"The most important

step you can take is also the least expensive step," notes Thomas. "And that is to have a conduit between you and the coaches." Thomas notes that there is no shortage of egos to be found on any coaching staff, which underscores the need to have a strong communicator in close contact with coaches.

"We tried very hard to establish positive dialogue with athletic administrators to get a total picture of their needs instead of working on a game-by-game or as-needed basis," says Thomas.

Finding the money for



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Finding the money for renovation is as difficult as removing 20 years of poor maintenance, Thomas added. The key is to put all the resources at your disposal to work, says Thomas.

"Convince your athletic department to do for you what it does for its sports programs," says Ardolino. Towson State coaches and ballplayers helped lay sod and the local utility company supplied about \$10,000 worth of trenching and plumbing work. "That's a real important part of our project. We knew we couldn't do it as a one- or two-man show. You need support."

Thomas also suggested to think big when making plans. Tell coaches and administrators of the field's potential and be a good salesman. "Don't walk in and hit them with the price right away," says Thomas. "I think it's better to go in one day and say, 'These are the improvements we want to make.' Give them the improvements and come back

later and tell them how much it will cost."

Ardolino and Thomas say their successful renovation has had a carry-over effect on the rest of the college. "We were able to go to the president for more money and, as a result of our success, we got an increase in our maintenance budget and have three new full-time people."

—Will Perry

Dr. Gwen Stahnke, previously with the University of Nebraska, has replaced the retired **Dr. Roy L. Goss**, who was turfgrass specialist at the University of Washington.

Mike Robinson of Seed Research of Oregon recently presented a \$500 research grant to **Tom Cook**, representing the Oregon State University Department of Horticulture.

Judy Brede, Jacklin Seed Company's warm-season grass breeder, has been promoted to the position of Director of Warm-Season Grass Research. □

LETTERS

Customers pay for your labor

To the editor:

Right on with your editorial "As I See It" in the November issue. You have reaffirmed the fact that customers, not the company, pay our labor. In order to elevate the quality and maintain the talent we need to provide the professional services our clients are demanding, we must re-evaluate our pricing policies. Not only will wages have to go up, but we must learn how to provide full-time employment with minimal or no seasonal layoff, and we must provide a good quality benefit package.

My investigation this past season tells me that our young people completing two- and four-year courses in horticulture are being

heavily recruited—many have as many as 12 job offers at very respectable wages. I am sure none of us wants to cut our business by 20 percent because we cannot get the necessary labor force.

Much will be said and written in the next few years about this serious problem, but your editorial hits it where it's at. Get the charges for services up, work efficiently and compensate our people acceptably.

Ritchie B. Skelton
Lied's,
Sussex, Wisc.

To the editor:

I am writing regarding the article "Biocontrols for the Green Industry" (November, 1989, LM), I agree that new developments in pest biocontrol research

continued on page 90

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The Greenhouse Effect may take hold of the Earth in your lifetime.

If that happens, the huge polar ice caps may melt, causing oceans to flood coastal cities. Drought will plague America's breadbasket. Rivers that supply water to cities will dry up. Heat waves will be commonplace.

A sharp increase in atmospheric carbon dioxide is a major cause of the Greenhouse Effect. Trees remove carbon dioxide from the atmosphere, but mankind has destroyed a third of the world's forests.



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Free Booklet. The National Arbor Day Foundation has published a free tree planting guidebook titled *Conservation Trees*. Return the coupon below and I'll send your free booklet by return mail.

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John Rosenow, Executive Director
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Of course you know that herbicidal activity is influenced by temperature, weed species, state of growth, and type of turfgrass. So a herbicide that would be effective in taking hardened-off spurge out of bluegrass would be totally out of place for treating dollarweed in bermudagrass.

Indeed, in light of today's complex weed control problems, the one-size-

fits-all approach to herbicide selection has become totally obsolete.

As a matter of fact, in order to maximize the efficiency of weed control throughout the U.S.A., we have developed seven different Trimec Turf Herbicide formulations.

But even more important, we have developed a unique manufacturing process for each of these seven

formulations so that the acid components are reacted together to form a *Complex* of unified salt, thus assuring you that every Trimec Complex will always be dependable, time after time.

For a comprehensive explanation of how a Complex differs from a formulator tank mix — and why this difference is vital to you in coping with weed control problems today — we invite you to take a close look at the schematic diagrams on the opposite page, which were drawn up for us by one of the most prestigious university professors ever involved in ornamental turf.

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Start early in the season with a broadcast treatment of Super Trimec any time when the temperature is above 40 degrees ... even in weather with intermittent rain or snow.

This not only enables you to get those over-wintering annuals at a time when you might otherwise have a void in your work schedule, but it also enables you to get them before their roots have a chance to compete with the turfgrass you are trying to thicken up ... and you get *all* the broadleaves because Super Trimec has the broadest spectrum of any post-emergent broadleaf herbicide.

Everett Mealman, President of PBI/Gordon, asks: "Can any other herbicide manufacturer point to such a record of safety and efficiency?"

☐ **Super Trimec:** Unparalleled broadleaf control for cool-weather broadcasting and spot treatment of hardened-off summer annuals such as spurge, oxalis and ground ivy. One gallon covers 4 acres.

☐ **Trimec Classic:** Unmatched efficiency for controlling broadleaves when they are actively growing. One gallon covers 2½ acres.

☐ **Trimec Plus:** The ultimate post-emergent herbicide. Outstanding control of crabgrass and nutsedge, plus all the broadleaves controlled by Classic Trimec.

☐ **Trimec Southern:** Especially designed to control broadleaves in 2,4-D-sensitive southern grasses.

☐ **Trimec 992:** The applicator's formula. Especially designed for tank mixing with liquid fertilizer and other multiple tank-mix combinations.

☐ **Trimec Encore:** A Trimec Complex that contains no 2,4-D.

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No matter how tough your weed problems, you can depend on a Trimec Complex for a specific solution.

Furthermore, Super Trimec is not only extremely economical in terms of cost per acre, but it is also very friendly to the environment in that one gallon covers four acres.

If, however, you are unable to apply your first broadcast until later in the season — when the temperature is up around 75° and the weeds are actively growing — don't fret about the lost time. Simply apply the one-and-only original Classic Trimec. You'll get the same excellent weed control, and your cost per acre will be slightly less (which will help you justify not getting out earlier with Super Trimec).

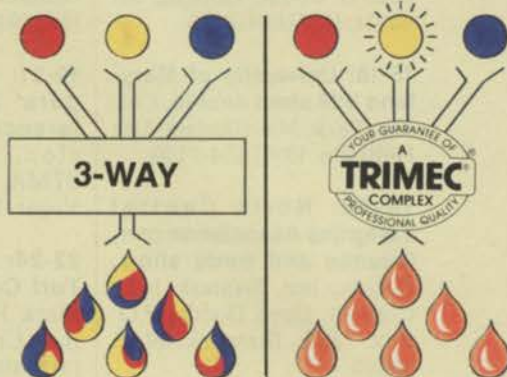
Depending on the season and the

condition of your turf, you may or may not need another application of Classic to treat summer annuals.

If crabgrass, goosegrass or dallisgrass become a problem, even in spite of your pre-emerge precaution, don't worry. Trimec Plus will take them out — usually with one application — without discoloring your Kentucky bluegrass or bermuda grass. And, of course, Trimec Plus will also control any broadleaves that are present.

Certainly Trimec Plus is the ultimate post-emergent herbicide... we have never introduced a new product that has met with such universal approval.

Ag-grade 2,4-D Ag-grade Banvel Ag-grade MCPP Tech. 2,4-D acid Tech. Banvel acid Tech. MCPP acid



Color code: Red, 2,4-D; Yellow, Banvel; Blue, MCPP; Amber, Complex acid. Note: Colors are for code only and do not in any way indicate the color of the product they are intended to identify.

Why only a Complex is right for weed control in ornamental turf:

Historically, the chemicals used to control weeds in ornamental turf were developed for use in agriculture, where 80% weed control is considered acceptable.

And while Trimec was specifically developed for ornamental turf, it was originally formulated by tank-mixing ag-grade 2,4-D; ag-grade MCPP; and ag-grade Banvel® (dicamba).

Although the original Trimec immediately and dramatically improved weed control over that of any other herbicide, the tank-mixing procedure of ag-grade chemicals resulted in minute inconsistencies in the chemical composition of individual droplets, with consequent inconsistencies in weed control.

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The manufacturing process involved in making a Trimec Complex is a trade secret, but the basic building block is known to all chemists. It is technical

dicamba (the active ingredient of Banvel) that triggers the synergistic activity and makes it chemically possible to react the acids into a Complex.

Of course, it is this same Banvel synergism that enables Trimec Complexes to be so effective with such a small amount of active ingredients... which in turn contributes to Trimec's unparalleled safety record, as demonstrated by the fact that more than 30 million acres of turf-grass have been treated with Trimec, and there has never been an instance in which damage to trees and ornamentals was proven to be the result of root absorption traced to Trimec when applied according to label directions.

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Schematic drawings show the differences between a tank-mix and a Complex

These drawings indicate that, in a formulator's tank-mix (left), the molecules of 2,4-D, MCPP, and dicamba do not combine to form a new molecule. Accordingly, each droplet will contain its own unique amount of one or more of the ag chemicals, and control may vary from droplet to droplet.

In a Complex (right), the three acids are reacted together to form a salt Complex. When this is formulated with the other important ingredients, wetting agents, dispersants and sequestrants, as well as with continuous analytical monitoring that includes the use of a high-pressure liquid chromatograph, the unique product that is Trimec becomes a reality. Every droplet is an exact mirror image of the total, and thus precisely optimizes the intended synergistic activity.

The differences between a tank-mix and a Complex become major when the goal is cosmetic excellence.

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JANUARY

15-17: 60th Annual Michigan Turfgrass Conference, Clarion Hotel, Lansing, Mich. Contact: Clarion Hotel & Conference Center, 6820 S. Cedar, Lansing, MI 48911; (517) 694-8123.

15-18: University of Maryland IPM short course, College Park, Md. Contact: Lee Hellman, (301) 454-7130.

16-18: North Central Turfgrass Association conference and trade show, Holiday Inn, Bismark, N.D. Contact: Dave Dodds, P.O. Box 7262, Bismark, N.D. 58502.

17: New York Turf & Landscape Association conference and show, Westchester County Center, White Plains, N.Y. Contact: Bill Renzetti, P.O. Box 307, Scarsdale, N.Y. 10583; (914) 636-2875.

17-18: Western Plant Growth Regulator Society annual conference, Red Lion Inn, San Jose, Calif. Contact: Wanda Graves, (415) 793-4169. To submit papers for presentation, contact Warren Bendixen, (805) 934-6240.

19-21: Sports Turf Managers' Association conference and show, Houston, Texas. Contact: STMA, P.O. Box 94857, Las Vegas, NV 89193-4857.

22-24: Midwest Regional Turf Conference, Adams Mark Hotel, Indianapolis, Ind. Contact: Jeff Lefton, (317) 494-9737.

24: Inland Northwest Turf and Landscape Trade Show, Spokane (Wash.) Convention Center. Contact: Jones & Associates, N. 908 Howard St., Suite 200, Spokane, WA 99201-2261; (509) 327-5904.

28-30: Wisconsin Arborist Association annual conference, Hyatt Regency, Milwaukee, Wisc. Contact: Richard Haas, 7300 Chestnut St., Wauwatosa, WI 53213.

29-30: "Think Trees" Conference, Holiday Inn Pyramid, Albuquerque, N.M. Contact: New Mexico State University Cooperative Extension, (505) 243-1386.

FEBRUARY

1-2: Univ. Alaska/Fairbanks Greenhouse and Nursery Conference, Soldotna, Alaska. Contact: Cathy Wright, S.R. Box 7440, Palmer, AK 99645; (907) 745-4119.

4: Women in Horticulture Conference, Sea-Tac Marriott, Seattle, Wash. Contact: Bill Collins, 18824 93rd

Ave. NE, Bothell, Wash., 98011; (206) 485-1283.

4-7: Associated Landscape Contractors of America annual convention, Krystal Vallarta Hotel, Puerto Vallarta, Mexico. Contact: ALCA, 405 N. Washington St., Suite 104, Falls Church, VA 22046; (703) 241-4004.

7-8: Ohio State Univ. Lawn Care Seminar, Parke Hotel, Columbus, Ohio. Contact: Sue White, (614) 292-7257.

7-8: ALCM Landscape Conference, Sheraton Inn, Boxborough, Mass. Contact: Greta Staley, 288 Walnut St., Suite 300, Newton, MA 02160; (617) 964-0452.

14-16: American Sod Producers Association Midwinter Conference, Walt Disney World Hilton. Contact: ASPA, 1855 Hicks Road, Rolling Meadows, IL 60008; (312) 705-9898.

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J-6-8

Circle No. 127 on Reader Inquiry Card

TOURNAMENT-LEVEL MANAGER

The four courses at Pebble Beach represent the ultimate challenge in country club management. As director of operations, D. J. Pakkala wouldn't have it any other way.

By Terry McIver, associate editor

As Director of Golf Course Operations for the Pebble Beach Co., D.J. Pakkala manages four of California's finest country clubs. He faces the challenges of multiple golf course management daily.

Just imagine your busiest day multiplied by four. The simple math yields a complicated answer.

Pakkala agrees that the challenges of being in charge of four courses are entirely different than the responsibilities for one. But he delegates well to each of his superintendents: Carl Rygg, Pete Bibber, Larry Norman and Bill Davis.

"Thanks to the climate, we're growing grass on a daily basis, and I serve as a consultant," says Pakkala. "I'm an agronomist who can answer my staff's questions and advise them on the way we ought to maintain the course."

But Pakkala does not rule with an iron hand. He has earned the respect of his superintendents, largely for his respect of each man's talent and experience.

"D.J. allows each of us to exercise individual expertise in maintaining the courses," says Rygg. "There are high standards for each course, but we can address our problems with our individual techniques."

"He's also positive about any situation. With D.J., the glass is always half-full."

Pakkala's responsibility for the quality of play and appearance of the Pebble Beach, Spanish Bay, Spyglass Hill and Del Monte courses makes him a different sort of public relations specialist. He represents the Pebble Beach Co., "and that means representing perfection; there's always room for more."

That perfection has made the Pebble Beach courses the locale for many a television commercial or magazine ad. And of course, many a golf pro has visited the famed links. The U.S. Open was played there, and it returns



'I once realized that if I were to die tomorrow, the golf course would still be here. That puts it into perspective.'

—D.J. Pakkala

in 1992. Thus, Pebble Beach holds a place in golf history as the only public course in the U.S. to host a major professional tournament.

Professionalism grows

Pakkala thinks one man in charge of many tracks is becoming a common job description, thanks to a wealth of qualified turfgrass experts. Good college training is thus an important first step for turf managers.

"The business is now so technical," says Pakkala. "You're more involved with the environment, more familiar with the laws that have to do with chemicals and their effects on the environment. I don't think there's any other way of being successful in the business without having been trained in a college or university. A lot are trained in business, economics or

accounting and then go into turfgrass management. The love of the outdoors, of being in a growing environment, is the common thread."

And of course, there's the love of the game. "Most all (superintendents) have some love of golf," says Pakkala. "It fits in well with their personal lifestyle."

Opportunities abound

Although many qualified experts occupy the turfgrass profession, golf's growth will bring increased job prospects. Pakkala believes, as do many industry observers, that the golf boom will continue for the next 15 years.

"I also see a trend," he predicts, "in which many development companies are hiring people like myself, people who have been in the business for 15 to 20 years, to manage their golf facility from start to finish. Developers need a person to represent the owner, who can relay information to the architect and contractor, and to serve as a liaison between the architect and developer."

"As I understand it, the only thing to keep us from the one-course-per-day goal is lack of builders. There are many architects and designers, but we need more builders."

Choosing a life

Pakkala's own passion for golf and the green industry began when he was 11 years old. His desire to play the game was so strong he'd hitchhike to the local course to get in a game before dark. Sitting down later to a warmed-over dinner was the trade-off, but to D.J., it was a worthy compromise.

His original career interest was in mathematics. But during college, his love of the outdoors guided his instincts to change his major to turfgrass science.

"I didn't know whether I wanted to be punching computers or working in an office all day long," he remembers. "That's when I made the change."



The oceanfront links of Spyglass Hill are under the watchful eye of D.J. Pakkala and superintendent Bill Davis.

His first superintendent assignment was at age 29.

Pakkala established another first for superintendents when he did occasional television commentary for nationally-broadcast tournaments such as the Bob Hope Classic and Dinah Shore Open in Palm Springs, Calif. "I used my experience with the game and my turf expertise to provide unique insights into course design and turf characteristics, and how they affect tournament play," he notes.

Biologicals an answer

Pakkala's multi-course duties expose him more than ever to the conflicts between chemical companies and environmentalists. Pakkala supports developments in biotechnology as a solution.

"I believe that chemical producers are doing their utmost to work with the EPA and environmentalists in producing products that are safe on the environment," he says. "And they're spending a lot of money in research and development to put their products on the market. The more they can work within integrated pest management—using natural means to take care of those pests they have difficulty with—the more they will be working together with the environmentalists...and the safer we're all going to be.

"I think it's an educational process. The GCSAA and the USGA have done a lot of work and are still working on it, sharing with the uninformed pub-



D.J., Tom Weiskopf, left, and architects discuss design issues at the Del Monte course.

lic what we're really doing."

Pakkala says the biggest challenge to any greens manager is "to tie it all in with Mother Nature. The hardest thing to deal with is the 24-hour-a-day possibility of changes in the weather. "Weather affects everything we do as managers, from the amount of play, to diseases that may be brought about by

'I believe chemical producers are doing their utmost to work with the EPA and environmentalists in producing products that are safe on the environment.'

—D.J. Pakkala

certain weather conditions."

Work hard, stay healthy

If professional golf course managers are to keep pace with rapid change in the industry, they must, Pakkala believes, take care of themselves first.

"Superintendents on today's best courses are under stress every day," he explains. If the course is a member-only operation, a superintendent could have numerous people offering opinions or complaints. For these reasons, Pakkala believes it is increasingly important that a superintendent not forget his well-being, his family's well-being or his job responsibilities.

He insists that, "We've got to become more aware of ourselves as persons. Lots of guys work 12-hour days for 12 months of the year. We need to be conscious of that. I once realized that if I were to die tomorrow, the golf course would still be here. That puts it into perspective.

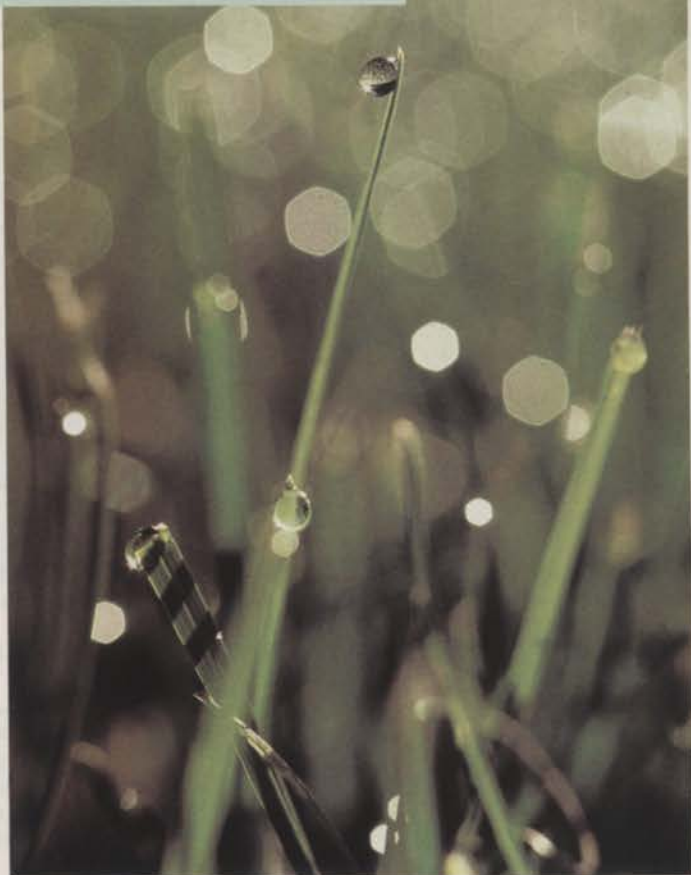
"There is a tendency," Pakkala explains, "to take the attitude that it's my golf course, and it's my responsibility. That's certainly noteworthy. But not to the extent that we forget about everything else."

Being on the Pacific shoreline offers Pakkala a welcome escape should his day ever get a bit too hectic.

"Go down to the ocean; look out and watch the gulls flying around without a care in the world. The Lord takes care of them. It leaves you with the impression that nothing really matters."

LM

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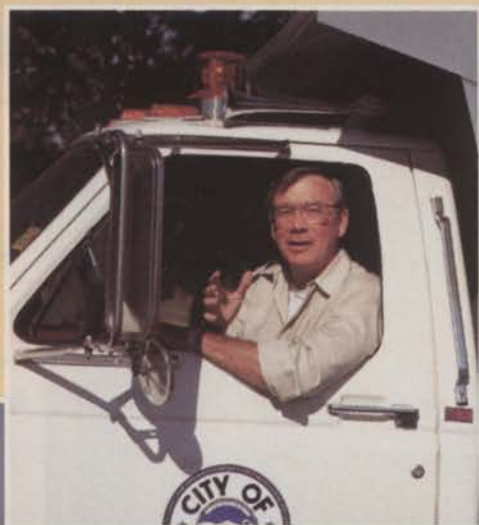


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TOUGH ROUGHS

Does your golf course look a little 'rough around the edges?' There's a way to polish that look, as proved by courses in Pittsburgh and Cleveland.



"On those areas I treated, it looked like someone spray-painted the intermediate roughs a dark green," says Ed Lach, of Edgewood Country Club.

If it's not one thing, it's another.

The trend toward lower fairway mowing heights and other cultural practices has created a neater, lusher fairway appearance and helped reduce *Poa annua* on many golf courses in the northern U.S. But better looking fairways only make shaggy or worn-out roughs look worse.

So after focusing their primary attention on fairways, greens and tees for many years, some golf course superintendents are now concentrating on getting their roughs up to par.

Penn State turf graduates Ed Lach and Terry Bonar are prime examples.

Since becoming golf course superintendent at Edgewood Country Club in Pittsburgh six years ago, Lach has upgraded the 18-hole golf course's overall appearance dramatically. Aesthetics have been improved by adding a number of flower and ornamental beds and planting additional trees throughout the roughs.

Building character

When Lach began contouring the fairways to "give them a bit of character," part of his fairways became the edges of his roughs. As such, they contained a high percentage of *Poa annua*. These largely *poa* intermediate rough areas take a beating during summer months, and there is a lack of definition between fairway and rough.

"Golfers tend to drive their carts along the edges of the fairways. Those areas suffer most from traffic damage," says Lach. "I've been overseeding with ryegrass for several years since ryegrass holds up much better to traffic. But I never had much luck getting a stand until two years ago."

In 1987, Lach sprayed the intermediate roughs around three of his fairways with Prograss herbicide. He made two applications in a 15-foot swath after aerifying and overseeding the areas.

"I really liked the results," says Lach. "Prograss killed the *Poa annua* so the ryegrass could take hold. There was a night-and-day difference the next spring between those three fairways and the rest of the course. On the areas I treated, it looked like someone had spray-painted the intermediate roughs a dark green. The ryegrass population increased to around 85 percent. I was so impressed I treated all of my intermediate roughs with Prograss the following year."

Lach is also updating his tree maintenance procedures. Instead of spending countless man-hours hand-trimming under trees, his crews spray a mixture of Roundup and Surflan in a neat circle around the trunks. As well



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Timely aerification and fertilization, proper chemical applications and deeper, less frequent irrigation reduce *Poa annua* on Lach's course.

as saving time, the practice gives the course a neater appearance.

One improvement seems to lead to another. Lach says his next step is to move out another 15 feet into the rough with his Prograss treatment so that he gradually converts most of his rough from *Poa annua* to ryegrass.

"When the rest of the course looks so good, it's hard to resist cleaning up the remaining rough," he explains.

And in Cleveland...

If it hadn't been for last summer's blistering drought, it would have taken Bonar much longer to improve roughs on Canterbury Golf Club's 18-hole course. Rough quality didn't measure up to the rest of the course, which is ranked in the top 100 courses in the country. With members playing up to 25,000 rounds annually and 11 national tournaments held on the course to date, it is continually in the spotlight.

Though Bonar has few problems with *Poa annua* on the course's bentgrass greens and fairways, he could never tackle the weed in his roughs. In spite of an intense six-year overseeding program involving cutting in ryegrass seed with a Rogers Groove Seeder, poa remained the primary grass in his roughs.

But the drought last year knocked the Canterbury roughs back to almost nothing. The double-row irrigation system only reaches part of the roughs and Bonar had no way to keep the poa alive.

"I decided to try Prograss since it was almost a no-lose situation," says Bonar. "If the product didn't work, I was only out the money for chemical and application."

Before seeding in 1988, Bonar scal-

ped the roughs with rotary mowers set as low as they go—about one inch. He then aerified eight times with a tractor-drawn aerifier to really loosen up the soil. In late August, he started overseeding roughs with a mixture of three ryegrasses.

Bonar cut in about 80 pounds of ryegrass seed per acre with the Rogers unit and broadcast another 80 pounds per acre. His crews seeded 30 to 45 feet back from the fairway into the rough, covering about 25 acres of the course's 80 acres of rough.

Noticeable Improvements

Bonar made two Prograss applications at one gallon per acre each, a month apart. He sprayed with a Cushman sprayer, covering 30 feet around each fairway. Though he seeded 25 acres, Bonar only sprayed 20 acres. The difference between the areas made an interesting test plot.

"There was a definite visual difference between the two areas the next spring," he notes. "Where we seeded and didn't spray, the ryegrass came up, but so did the poa. But where we seeded and sprayed, the poa is negligible. I was amazed with the results. Our roughs are thick and great now."

Now that his ryegrass stand in the roughs looks so good, Bonar says it makes the roughs around his greens look bad. He now wants to re-sod those areas with bluegrass.

He is improving other areas of the roughs as well. To round out his nine-member full-time crew, he hired an arboriculturist last year to take care of the trees scattered throughout the roughs. After identifying and tagging all 2000 trees over four inches wide, he now has an overview of how to better maintain them.

LM

MOWING FOR BEAUTY

Changes in the mowing program have made the biggest differences in aesthetics at Pittsburgh's Edgewood Country Club.

"We switched from gang mowers pulled by a tractor to three Toro GM-3000 triplex mowers and one 350-D five-gang unit," says superintendent Ed Lach. "The old gang mowers would leave long, uncut grass in many little dips and valleys of the turf. This would often give a golfer an unfair lie on the fairway. Our triplex mowers allow us to cross-cut and angle-cut, leaving a neat, smooth appearance."

Daily routines

Now his crews mow half the fairways with triplex mowers and the other half with the 350-D one day. The following day, the procedure is reversed. They mow fairways six days a week at slightly lower than $\frac{3}{8}$ -inch and collect clippings with the triplex units.

Lach starts out every spring by rolling and aerifying all greens, tees and fairways and top dressing the greens. His crews also vertical mow and brush the greens several times each spring. Greens receive three or four "spikings" and light top dressings through the summer. Then fairways, greens and tees are aerified again after Labor Day.

Anti-poa campaign

Many of Lach's practices revolve around reducing populations of *Poa annua*. Annual bluegrass gained a foothold on the Edgewood course soon after it was built in the 1920s.

By following such cultural practices as timely aerification and fertilization, proper chemical applications, collecting clippings, and trying to irrigate more deeply and less frequently, Lach is slowly decreasing the amount of poa on his fairways, greens and tees. These practices reduce compaction, suppress seedhead formation and encourage deep-rooted turfgrasses such as bentgrass and ryegrass. □

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Bayleton Dyrene



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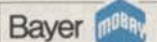
Plant turf varieties that resist diseases in your area. Apply a balanced fertilizer. Aerate, irrigate, and dethatch periodically.



In addition to dollar spot, BAYLETON prevents summer patch, anthracnose, and other major turf diseases.

DYRENE prevents brown patch and leaf spot with excellent residual control.

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WHO CALIBRATES YOUR SPRAYER?

University of Nebraska researchers found that only one of six golf courses are accurately applying pesticides. What would they find at your course?

by David Varner, Ph.D., and Robert Grisso, Ph.D.

Last summer, researchers visited 53 of the 60 golf courses of the Nebraska Golf Course Superintendent's Association (NGCSA) and found that only one of six were accurately applying pesticides.

Their calibration accuracy study showed that only 17 percent of the courses applied pesticide carrier volumes within five percent of their intended amount (though this number may be conservative because possible tank mixing errors were excluded).

(Spray equipment not delivering within five percent of the desired pesticide carrier volume should be adjusted and recalibrated according to the *Guide for Private and Commercial Applicators*.)

How bad was it?

The average applicator error was 26 percent. However, the magnitude of errors ranged from a mere 0.1 percent to an alarming 177 percent over-application.

Cooperators who over-applied did so by an average of 19 percent. For a quick estimation of over-application costs, assume an average preventive rate of Daconil 2787 at 4 oz. per 1,000 sq. ft. was used (Daconil 2787 was the most frequently-used pesticide among the study's cooperators at an average of \$37 a gallon).

Correctly applied, the cost of Daconil would be \$1.16 per 1,000 sq. ft. However, using the average over-application error of 19 percent, the cost of application would be an additional \$0.21 per 1,000 sq. ft. These costs escalate when considering the total treated area with multiple treatments throughout the season.

In many turf programs, pesticides are key elements in management programs, but are useful only if applied according to label directions. If not properly used, pesticides may become

our worst nightmare rather than a proven management tool as we begin the 1990s.

Over-application may also cause turf damage, excessive pesticide residue, increased potential for human exposure and water contamination through surface run-off and percolation.

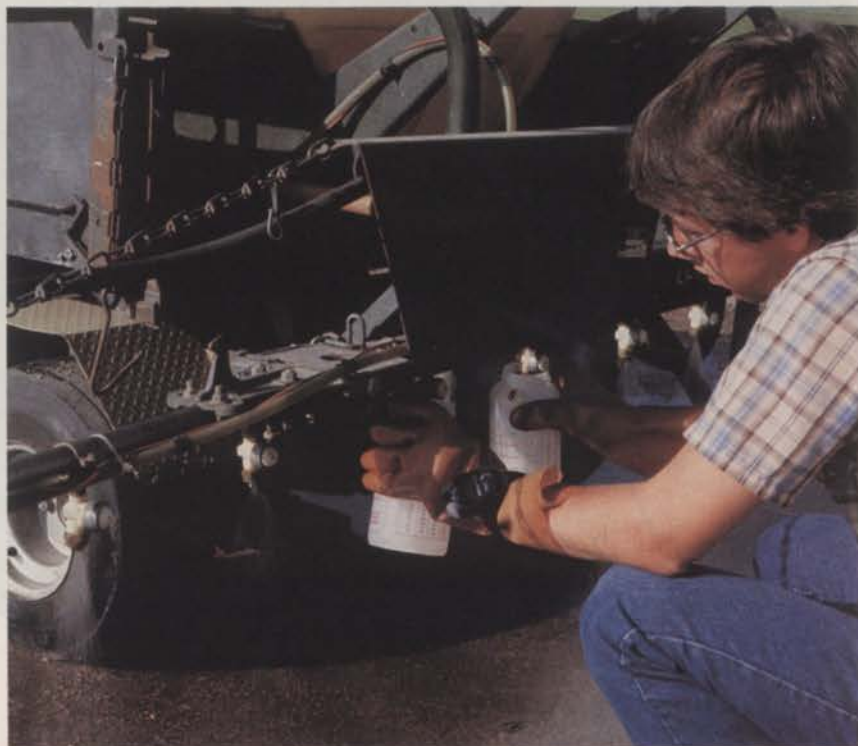
Another costly venture

Golf courses are unique in the fact that they are often positioned near residential areas with a body of water nearby, and are designed to attract people for entertainment. This makes awareness and accuracy of pesticide application even more important.

Those who under-applied pesticides did so by an average of 34 percent. This can be just as costly as over-application. Under-application may require additional applications, which increase pesticide, fuel and labor costs.

In addition to quantity of pesticide applied, sprayer performance was evaluated on the quality of pesticide application. Quality of application refers to the consistency of nozzle discharge across the boom. This was determined by measuring discharge measurements from each nozzle along the boom.

continued on page 50



Frequency of sprayer calibration was found to be closely associated with application accuracy. Two-thirds of the applicators who calibrated before each spray operation were delivering within five percent of their intended amount.

Recent studies show Chipco® Ronstar® G works without root pruning. We say judge for yourself.

Let's face it, the last thing you need from a turf herbicide is root damage. That's why so many golf course superintendents are making

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apply it to ornamental plantings at the same time you do your turf. You'll get up to 120 days of weed-free control.

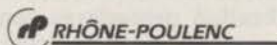
Plus CHIPCO® RONSTAR® is also available as a wettable powder and in granular fertilizer formulations under well known brand names.

So judge for yourself. You'll discover why CHIPCO® RONSTAR® is the number one turf herbicide on the course today.



Chipco® Ronstar® G

Brand Herbicide





Frequency of calibration	% of sample	Percent of applicators within 5%
Every spray operation	11	67
2 to 3 times/year	28	13
Once/year	25	15
Less than once/year	36	5
	100%	

Unless you know the ground speed of your sprayer, you cannot be sure you're not over- or under-applying pesticides. Therefore, accurate, legible speed sensing mechanisms are essential sprayer components.

Eighty-four percent of the cooperators were within recommended guidelines. This suggested that cooperators are maintaining nozzles appropriately. If two or more nozzles were discharging more than 10 percent above or below the discharge average, operators were advised to replace them all.

Researchers found no association between consistency of application and carrier volume accuracy. This shows that it is more important to regularly check sprayers for both types of accuracy.

Frequency of calibration was closely associated with application accuracy. Two-thirds of the applicators who calibrated before each spray operation were within the 5 percent application error criteria. Comparatively, only five percent of those who calibrated less than once a year were within 5 percent. More than one-third of the cooperators calibrated less than once a year.

Calibration methods

The "known area" calibration procedure was the most common procedure used on golf courses. However, only 14 percent of the superintendents employing this procedure were considered accurate applicators.

The most accurate cooperators were those who used spray monitor and controller systems. Sixty-seven percent of these applicators were accurate.

The most common application equipment used on Nebraska golf courses were Cushman Trucksters equipped with Broyhill sprayers, cen-

trifugal pumps and fan nozzle tips. A common problem among sprayers in the study involved pressure gauges showing a system pressure different than the actual nozzle pressure.

Random inspections of pressure consistency among sprayer systems found differences as large as 30 psi. The most probable cause for most of these pressure differences were faulty gauges. Many gauges showed signs of corrosion, had broken crystals, or had a measuring range too large to accurately measure typical operating pressure.

Nozzle problems

Restrictive plumbing systems, which included excessive lengths, inadequately sized and kinked hoses, improper screen sizing and anti-drip devices, were other faults leading to reduced pressure at nozzles.

Educational programs focusing on pesticide application accuracy should continue to address safety concerns for both the applicator and the environment. These programs need to educate applicators to calibrate their equipment and explain why calibration should be mandatory for any individual who deals with pesticide applicators. Applicators need to be certified for their own safety, the safety of their clientele, the general public and the environment.

Learning procedures

Applicators should learn to use one or two calibration procedures consistently to assure regular pesticide application accuracy. Procedures

should include measuring and adjusting system pressure, ground speed and nozzle discharge. These procedures should be used before each spray operation. Equipment failure and changing sprayer operations warrant this routine.

Sprayer discharge capacities and pressure gauges should be tested for adequacy and accuracy. Pressure gauges should either be replaced or tested at least once a year.

To increase both awareness and skills in pesticide application, Cooperative Extension offers private and commercial pesticide certification training sessions. Proper sprayer calibration includes the fine tuning of both the quality and quantity of pesticide application. These requirements dictate the proper adjustment of sprayer speed, pressure and nozzle discharge.

Uniformity of application may be increased by using nozzle materials that are more durable than the traditional brass or the economically-priced plastic. Stainless steel nozzles and plastic nozzles with stainless steel inserts have a slightly higher initial cost but last up to four times longer. Excessive losses and over-application of pesticides may be eliminated by using anti-drip devices.

Sprayer system pressure must be

Nebraska study at-a-glance

Who: Nebraska researchers interviewed 53 of the 60 golf course superintendents in the Nebraska Golf Course Superintendents' Association (NGCSA).

What: On-site interviews and sprayer performance tests were conducted to determine how accurately superintendents were applying pesticides.

The results: Only one of six cooperators was found to be applying pesticides within five percent of their intended amount. The average application error was 26 percent, with the magnitude of error ranging from 0.1 percent to an alarming 177 percent.

Eighty-four percent of the cooperator's were within recommended guidelines for sprayer performance. The most accurate applicators were those who calibrate sprayers most often. □

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Circle No. 297 on Reader Inquiry Card

Accurate ground speed is essential

Accurate pesticide application requires that the operator know exactly how fast the sprayer moves over the ground surface. Yet many of the superintendents interviewed were unable to determine this due to faulty equipment or new tires.

Inaccurate speed sensing mechanisms was determined to be a significant equipment problem. In most situations, ground speed was estimated by correlating power take-off (PTO) speeds with driving gears. Many applicators had to guess ground

speed because speed tables used with PTO speeds had deteriorated beyond legibility or tires had been replaced with a new size, making the table invalid.

Nearly 63 percent of the co-operators had ground speed errors of more than five percent. This automatically places the cooperator in the inaccurate applicator category unless another factor compensates for the error during calibration.

Because of wheel slippage and rough surface conditions, the actual speed is often dif-

ferent from the tachometer and speedometer readings.

For an accurate measurement of ground speeds less than six miles per hour, mark off a distance of 220 feet. Measure the elapsed time in seconds required for the spray unit to travel 220 feet. The speed is calculated as: $\text{mph} = 150/\text{seconds timed}$. If the ground speed is above six miles per hour, mark off a distance of 440 feet and calculate as $\text{mph} = 300/\text{seconds timed}$.

—The authors □

maintained within nozzle specifications. Operators outside of this specified range cause spray pattern distortion, accelerated nozzle wear and improper discharge rates through nozzles. It is important to remember that the relationship between nozzle pressure and discharge rate are not linear. In fact, the pressure needs to be increased by almost four times to double the discharge rate.

Using pressure gauges

The pressure discrepancies may be monitored by installing a pressure gauge on the spray boom. This is a very practical way of monitoring the actual boom pressure. The current pressure gauge should also be main-

tained as a check on the system. Anti-drip devices can reduce system pressures by three to five psi, so adjust your pressure to meet nozzle requirements accordingly.

A sprayer monitor or controller that changes system factors or alerts the operator of system changes or problems would be a good investment.

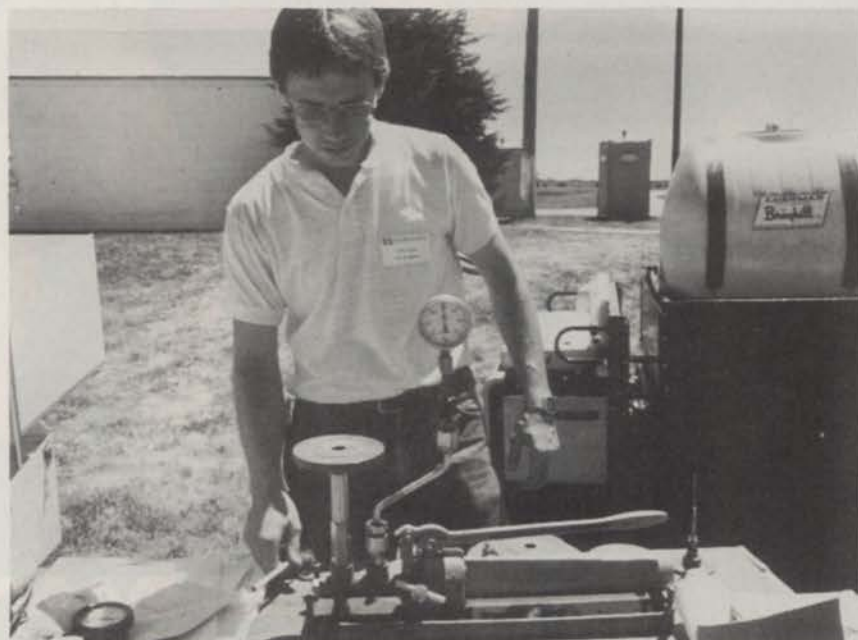
A monitor is a device that measures flow, pressure and speed. It uses electronic sensors for measurements but makes no adjustments. A controller adjusts for various spraying conditions by increasing or decreasing flow or pressure. But be aware that these systems are not infallible. For example, if a nozzle plugs, a controller in-

creases the pressure to maintain flow throughout the system and ignores the blockage from a single nozzle.

Spray equipment will apply pesticides properly if operated and calibrated.

Eyes don't have it

It is not enough to visually inspect sprayer performance. The eye cannot detect differences in the nozzle discharge unit until it nears a 50 percent error. Operator's manuals include tables to show spray volumes for various nozzles, spacings, pressures and ground speeds. Use this information to initially set up the sprayer, then use proper calibration procedures to "fine-tune" the sprayer for accurate



Pressure gauges may be tested using a dead weight tester (shown here). Inaccurate pressure readings can cause pattern distortion, accelerated nozzle wear and improper discharge rates (photos courtesy of Dave Varner).

Awareness and accuracy of pesticide application is critical.

application.

Proper tank mixing is also critical. Incorrect tank mixing could make pesticide application errors worse. Remember to read and follow pesticide label directions and safety considerations. Obtain educational materials for training for all personnel using or working around spray equipment. **LM**

Dr. David Varner is an extension agent and Dr. Robert Grisso is extension agricultural engineer at the University of Nebraska, Lincoln. Their study was conducted in cooperation with Dr. Robert Shearman of the University of Nebraska.

Manhattan II helps smooth out the roughs at Inverness

INVERNESS CLUB, TOLEDO — Superintendent Tom Walker chooses Manhattan II to overseed roughs at this prestigious club because of its wear resistance, quick establishment, dark green color and drought and disease tolerance. But Tom finds Manhattan II's big plus is *density*. Manhattan II actually produces more leaves per plant, an economy sometimes overlooked.

This increased basal tillering, coupled with Manhattan II's lower crown help 'heal' shallow divots by spreading laterally. This is why Manhattan II is used to overseed the range tees at Inverness, too.

Manhattan II was developed to take the abuses hard use areas demand, and look good while doing so. Give it a divot. Rough it up a bit. Manhattan II can take it. Just ask Tom Walker at Inverness Club.



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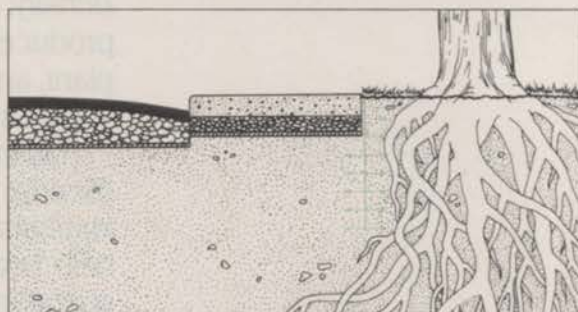
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Together, they reroute roots without harming your trees and plants. And preserve the beauty of your landscaped areas — golf greens, cart paths, sidewalks, curbs, walkways, parking lots, swimming pools, gardens and others — for years to come.

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Underground, Biobarrier sets up a solid rootproof zone that spans one to two inches on each side of the fabric. That's the Treflan controlled-release vapor zone. A zone so powerful, it repels roots at a controlled rate for 15 years or more.



Top Without Biobarrier, tree roots penetrate paved surface and aggregate base, causing unsightly cracking and heaving.

Bottom With Biobarrier, a protective zone of Treflan vapor reroutes roots downward without harming roots or tree.

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tame ur landscape.



courts, swimming pools and other recreational areas from unsightly roots. And helps keep your reputation in good standing among your customers.

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Unlike other control methods, Biobarrier won't harm trees or nearby landscaping. It doesn't kill roots, it just reroutes them away from your golf, recreational or landscaped areas.

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Easy to install.

The Typar fabric in Biobarrier is flexible to make installation simple. Just install vertically along your golf, recreational or landscaped areas

where tree roots threaten to bring out the ugly side of your landscape.

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For the complete story on Biobarrier, see your Elanco representative. Or send for a free technical brochure from Elanco Products Company, Lilly Corporate Center, Dept. EM-455, Indianapolis, IN 46285, U.S.A. Or call toll-free: **1-800-352-6776**.

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ELANCO

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The Polo Trace Course in Florida involved 70 to 75 acres of hydroseeding. Bahiagrass and perennial ryegrasses were used in the roughs and bentgrass on the greens.

A COMPATIBLE PRACTICE

Hydroseeding is becoming more popular with superintendents because it offers even, precise seed delivery and fast green-up.

by Robert Stinson, the Finn Corp.

At a time when more people seek to participate in sports activities, golf occupies a unique place in the sporting world because of the challenges within the game that remain throughout the course of a player's life. You can play to improve a previous score on a certain course or hole, or to beat a single opponent or a group of opponents in a tournament.

Perhaps this is why the number of golfers grows annually in this country and around the globe. In 1988, more than 200 new golf courses were finished and another 300 under construction were due for completion in 1989. Until the year 2000, an average of 350 courses a year will be needed to meet the golfer demand.

More than 23,400,000 people golf in the United States, and the number is growing daily. Because that number is so high, maintaining present courses is as important as

building new ones.

Individual design is one of the challenging aspects of playing golf. Each course has unique features that enhance the skills required to play a good round. For example, the Indianwood Golf and Country Club course in Lake Orion, Mich., is built in the links style common to inland Scotland. Course superintendent Mark Jackson says the new course has the highest slope rating of any course in Michigan and, thus, is the most difficult to play.

Indianwood's links style of terrain made hydroseeding the most appropriate seeding method to use on the banks, hills, mounds and slopes. The mounds are very sandy and it was impossible to drive or work on them without damaging the seedbed preparation.

As with some other courses, the greens were planted by the two-step method. The seed was first applied

and then fiber mulch was sprayed on both as a seed cover and to hold moisture for faster growth.

One-step seeding

The one-step method of applying seed, fertilizer and fiber mulch at the same time was used in the other hydroseeded areas. Jackson used the Finn HydroSeeder, a useful maintenance tool for touch-up, watering and re-fertilization as needed.

Today many courses are being built as parts of large residential developments. The Eagle Landing Country Club near Atlanta is the third such development with which course superintendent Dave Gardner has been associated.

While the seeding of the first two developments was subcontracted, a decision was made during construction of the Eagle Landing development to purchase a HydroSeeder for increased efficiency and flexibility in performing various tasks. According to Gardner, in addition to using the HydroSeeder during the actual course construction, it is used to vegetate roadsides, establish home lawns, water shrubs and trees and to establish or maintain turf as required in a large acreage development.

Public course boom

In addition to the private courses under construction, many public courses are being built. Many contractors new to course construction have become involved because of existing opportunities.

Steve Turner of Evergreen Lawn Care in Bowling Green, Ky., was still relatively new to hydroseeding when



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he began to work on the Hartland Municipal Golf Course, using his newly-acquired HydroSeeder. Hartland is a centerpiece development for the Bowling Green community and will include a new convention center and upscale private homes within and around the public course.

Each of the greens at Hartland was constructed to be approximately 8,500 square feet. The bentgrass seed was extremely small; Turner did not see how a mechanical seeder could have been calibrated to accurately seed at the 14 pounds-per-green rate.

Benefits noted

Turner employed a HydroSeeder with one 800-gallon tankload of seed and water with a mulch tracer to do each green. By hydroseeding the greens, he was able to do the job without introducing any foreign seed material.

In the process of doing the course, Turner discovered a number of the

benefits of hydroseeding. He was able to do a more precise job in applying material around cart paths and other obstructions with minimal clean up. His labor, as opposed to other seeding and mulching methods, was reduced significantly.

Turner now "loves the hydroseeding process" and will be seeking to do more golf courses in the future.

Golf course designers and construction personnel in the United States are renowned for their expertise and are now doing projects throughout the world. An example is the Golf Course Barbaroux in Brignoles, a Pete Dye-designed private membership course in the south of France.

John Alford, a construction superintendent on a number of Dye courses in the southeastern U.S., headed the construction team at Barbaroux.

One of the important tools that Alford wanted for the job in France was

a HydroSeeder, a machine that he had used on each of his previous courses. John liked the machine because of the ease with which the job could be done.

No washout worry

"Once the ground has been prepared, you can do the work and not worry. It will be stabilized and you should not have nearly as much concern about washout," says Alford.

The French workers were also impressed with the machine, calling it "the elephant" due to its appearance and work capacity.

The HydroSeeder remains at the course, filled with water as a member of the Barbaroux Volunteer Fire Department, since the terrain of the area dictates that larger fire-fighting tanks would not be practical.

Southern Hydro Turf, Inc., of West Palm Beach, Fla., has done the seeding for many courses. They are working on the Polo Trace course, which



In addition to the playing surface, many areas—such as cart paths—require continuous management to maintain the desired condition. Using a tower gun or remote hose method of hydro-seeding makes it easy.

Hydroseeded greens can be playable in as few as 60 days.

will involve 70 to 75 acres of hydroseeding. Argentine bahia and perennial ryegrasses are being used in the roughs and bentgrass will be used on the greens.

Southern Hydro Turf's Terry Wilson has reported that greens on earlier such projects were playable in as few as 60 days, an important consideration with the growing use of established courses, which need constant maintenance.

Touching up areas

In addition to the playing surface, many areas—such as cart paths—require a continuous program to maintain the desired condition. A tower gun or remote hose method of hydroseed application makes it very practical to reseed or touch-up all areas during the growing season.

Throughout all phases of golf course construction and maintenance, a hydroseeding is a most valuable asset for efficient landscape management. In addition to the obvious benefits of lead time and effort required for a project, the improved playing surface and aesthetic quality of the surroundings add significantly to the total enjoyment of a round of golf. **LM**



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Many landscapers are planning to cash in on the nightlighting market, which is expected to grow significantly.

BY THE LIGHT

Landscapers on the cutting edge of the industry are beginning to offer nightlighting installation as a viable add-on service. Golf course superintendents and park managers are also taking advantage of the trend toward 24-hour beauty.

by Jerry Roche, executive editor

Using "the light...of the silvery moon" to illuminate landscapes sometimes just isn't good enough.

For stunning, you can't beat a well-lit landscape at night. For secure, you might consider installing an intruder alarm system—but nightlighting can help. For safe, there's nothing like having a well-illuminated driveway and sidewalk.

These, then, are the main reasons to sell nightlighting systems to landscape clients—whether you're a golf course superintendent looking to spruce up a clubhouse area, a contractor looking to make a little extra cash on your next residential installation, or a park superintendent looking to minimize vandalism.

The trend toward night-lit land-

scapes has captured the fancy of homeowners and facility managers in the extreme South and Northeast. If lighting follows other landscape trends, it will soon be popular from sea to shining sea.

Lighting boom

"There's a tremendous excitement for nightlighting going on throughout the country," notes Larry Powers, president of Genlyte, Inc., Littlestown, Pa. "There's a big market for high-end residences, hotels, restaurants and all types of retail establishments, particularly stand-alone establishments. We see a real explosion in the coming years."

"I see a tremendous opportunity for a contractor. In many areas of the country, they would have a tremen-

dous surge of business. We think it can be very profitable, too. One of our distributors in northern New Jersey says that they have never sold a landscape lighting job under \$1,500."

Landscape lighting, a \$120 million a year business at the wholesale level, is projected to grow 10 to 15 percent per year over the next five years.

"This is an extremely hot area now," agrees Rick Wiedemer of Hinckley Lighting, Cleveland, Ohio. "People are pouring thousands of dollars into their landscapes. But you can't see the expensive landscaping unless you light it."

The art as science

Good landscape lighting is as much art as science. Few hard-and-fast rules apply, but it employs certain funda-

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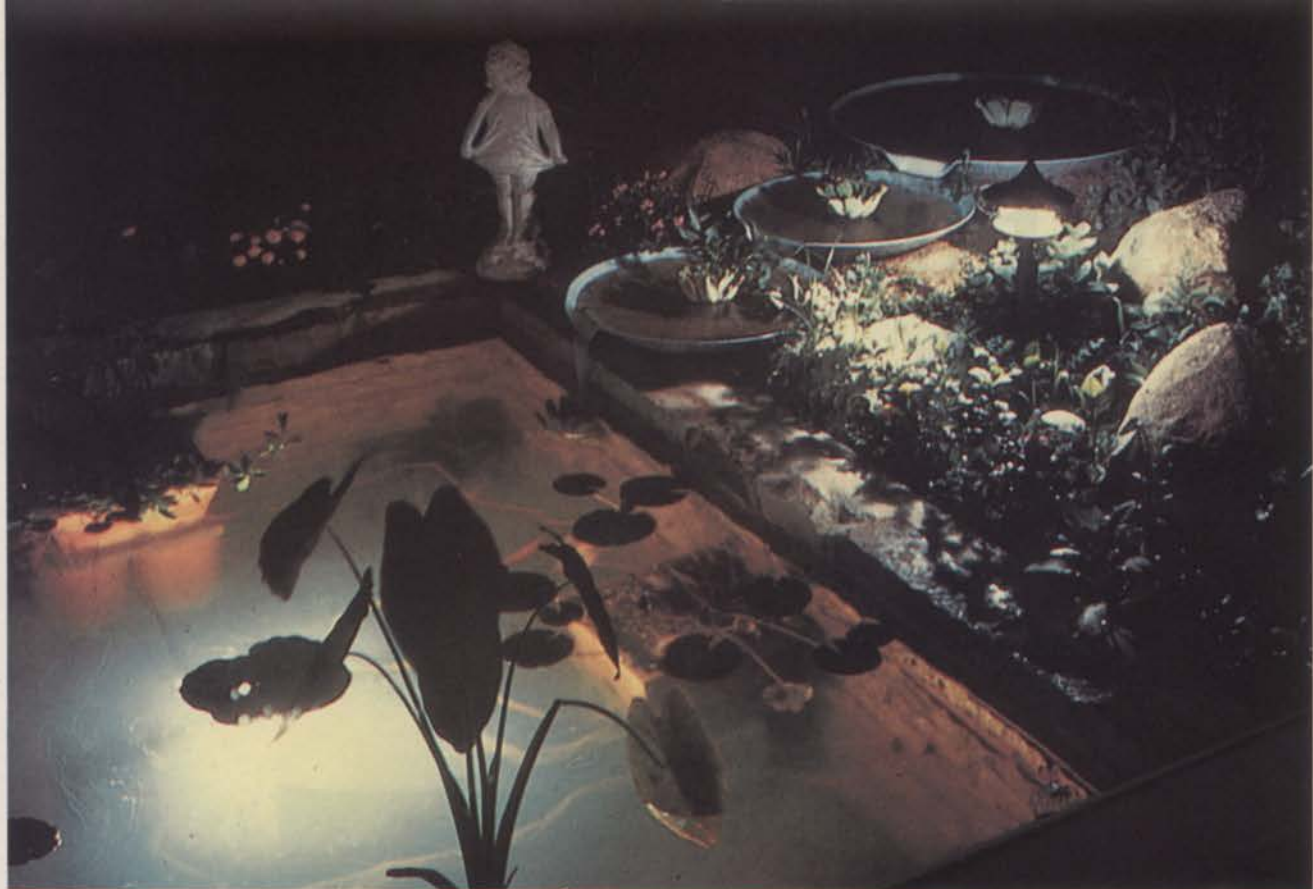
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Low-voltage lights like this one on the ground from Hinckley Lighting can be matched to outdoor line-voltage lights installed on residential properties.

mentals. Knowing the basics will help the job go easier, minimize callbacks and more fully satisfy the customer.

"The average landscape contractor won't know about the aesthetics of landscape lighting unless he or she goes to some seminars or places where somebody teaches good lighting techniques," Powers says. "The American Lighting Association puts on a series of lighting seminars throughout the United States on techniques of landscape lighting."

Neil Mitchell of Major Electric Supply, Pawtucket, R.I., organized a seminar in September for landscape architects and contractors and electricians. Despite terrible weather, a standing-room-only crowd showed up.

"Selling landscape lighting is as easy as taking candy from a baby," Mitchell believes. "All the contractor has to do is open up his yap. If it's installed at the time the landscape is being installed, it's very easy and economical."

Mitchell says that contractors can charge homeowners \$100 to \$200 per fixture and make a good profit.

"We've found that the average residential lighting sale is \$3,000 to \$5,000," notes Wiedemer. "On big residential jobs, we think that it's probably best to follow up a year later with lighting. If the owner is tapped out after the landscape construction,



'Selling landscape lighting is as easy as taking candy from a baby.'

Neil Mitchell
Major Elec. Supply
Pawtucket, R.I.

the lighting might come into play even two to three years down the road."

Lighting by design

When selling lighting, the design begins by determining the client's

needs. Since there are so many fixtures on the market, the first step is to gather information and formulate a plan based on specific requirements. Make sure to ask:

- What lighting effect does the client expect?
- Does the client entertain often?
- Where are the guests usually located?
- Where should the lighting system be controlled?
- Is security a primary concern?
- Which key landscape features should be used as focal points?
- What tone or feeling do you want to achieve?

Next you should define the budget and identify the lighting manufacturers that fit your needs. Finally, select and place specific lighting fixtures.

"There are a lot of different grades of landscape lighting," notes Powers. "Most people aren't very happy with the very low-end products once they put them in. If I were a contractor installing a job, I'd want to make sure I had a quality product with some warranties. Dogs wet on them, sprinkler systems sprinkle on them and they take every kind of outdoor abuse that there is."

The right light

Fixture selection is a critical decision. Selection is made by considering economics, positioning, shielding and

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A CRIME-STOPPER

Adequate nightlighting can deter crime, according to the National Lighting Bureau (NLB). A dramatic example was provided in a case history submitted to the organization's National Lighting Awards Program.

After two female employees of the Bellevue (Wash.) *Journal-American* were accosted in the daily newspaper's parking lot in 1982 and again in 1983, new lighting was installed. No further incidents have occurred.

Somewhat ironically, the new lighting—which provides 21 percent more light—costs 24 percent less per year to operate and maintain.

Journal-American facilities manager Robert F. Phillips sought Maurice W. Dick, service manager for Holmes Electrical Contractors of Renton, Wash. Dick recommended high-pressure sodium lighting to replace incandescent lights.

Annual energy consumption of the new system was \$840. The cost of replacement lamps, lamp replacement labor and ballast replacement amounted to \$505 per year, bringing the system's total operation and maintenance costs to \$1,345 per year. Because the new system's 2.042 kilowatt-hour connected load is 54 percent less than the original system's, utility costs were cut \$454 per year.

In addition to the safety factor, Phillips says that several employees commented that the new lighting, with its distinctive "golden-white" color, made the buildings and landscape more attractive, linking them into a unified whole at night.

According to NLB executive director Richard H. Geissler, the *Journal-American* case "demonstrates the important difference between lighting management and lighting energy conservation."

More information about the benefits of lighting and specific techniques that can be applied to obtain them is available from the NLB. A free directory of the bureau's publications is available by writing the NLB, 2101 L St. NW, Suite 300, Washington, D.C. 20037; or calling (202) 457-8437. □

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LOW-VOLTAGE, NOT LOW-PROFILE

More and more, experts are agreeing that low-voltage landscape lighting is the thing to sell to residential customers, rather than what they call "line-voltage" lighting systems.

Low-voltage systems are light, movable and safe. They employ a transformer to reduce voltage from line-level (110- to 120-volt house power) to low-voltage (12-volt, equivalent to an automobile battery) and direct-bury cable. Line-level equipment, on the other hand, requires junction boxes and underground conduit. It is extremely permanent, compared to its low-voltage cousin.

"Low-voltage systems are also very safe," notes Art Crisfield of Hinckley Lighting in Cleveland, Ohio. "If you run over the power lines with a mower or snip them with pruners, you won't blow your teeth out."

"They also have freedom of

movement," notes Ken Nicholas, Crisfield's co-worker at Hinckley Lighting. "We make 6-, 12-, 18- and 24-inch stems on spikes. You just stick them into the ground where you want them. If you want to move them, it's extremely easy. You just pull them out."

Neil Mitchell of Major Electric Supply in Pawtucket, R.I. notes four advantages of low-voltage lighting:

- Generally speaking, the fixtures themselves cost less. Though cheap plastic models can be bought at discount department stores, lighting manufacturers and electric supply houses have top-of-the-line metal products priced beginning at \$25 each, which is still relatively inexpensive compared to line-level equipment.

- Installation is considerably less costly. In many cases, digging is not really necessary. For instance, wiring for lights in ornamental beds can



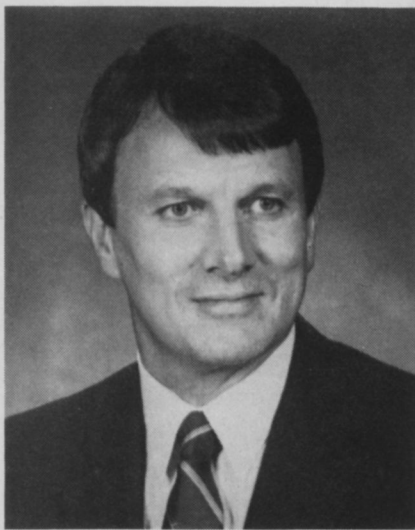
Ken Nicholas (l) and Art Crisfield of Hinckley Lighting say low voltage systems are economical and safe.

be easily buried under mulch. Licensed electricians are required to install the line-voltage systems; no license is needed for low-voltage installation.

- Systems are safer for children and pets. No "blown teeth," as Crisfield says.

- Though the bulbs are low-voltage and low-wattage, they produce two to three times the amount of lumens as their line-voltage equivalents.

—Jerry Roche □



'There's tremendous excitement for nightlighting now.'

—Larry Powers
Genlyte, Inc.



'You can't see the expensive landscape unless you light it.'

—Rick Wiedemer
Hinckley Lighting

"dayform" (what the fixture looks like in daylight).

Power sources include line-level (120-volt) and low-voltage (12-volt). Each has its advantages. Types of lamp sources are incandescent (including quartz/tungsten and

halogen), metal halide, mercury vapor and high-pressure sodium. Colored lenses, no matter what type of source, should be used sparingly.

Placement, of course, is the key to a beautiful nightscape. Positioning fixtures in relation to the object to be

lighted can radically affect the finished job's mood and tone. The best way to determine the most desirable fixture placement, most experts agree, is trial and error at the job site.

Locating a spot very close to the object creates tremendous contrast, character and shadows. The further the light source from the object, the softer the gradations between high-spots of light and deep shadows.

As a sales tool

A final note to bear in mind. Observes Wiedemer: "When people go down the road at night and see these well-lit landscapes, they're going to ask who did the landscaping, not who did the lighting."

"The progressive, aggressive landscapers will recognize that this is an excellent add-on sale."

An instructional video tape produced by Genlyte can help landscape contractors acquaint themselves with the lighting design and installation market. It is available by writing P.O. Box 128, Littlestown, PA 17340 or calling (717) 359-7131.

To find out more about outdoor lighting, write or call the American Lighting Association, 435 N. Michigan Avenue, Chicago, IL 60611; (312) 644-0828. The ALA offers a 16-page, four-color brochure for \$2. Landscape managers can also order bulk copies at 35 cents each with a minimum order of 250. **LM**

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Small plots in strip malls usually require a production rate based on hours of labor by task and a standard hourly rate for the piece of machinery used.

MATCHING BIDS WITH JOB COSTS

Northwest Landscape Industries has found that the best route to the land of profits is through efficient estimating and job-costing.

by Dick Landis

Landscape contractors know that accurate and profitable bid proposals are one of the keys to staying in business. Jim Wathey, vice president of Northwest Landscape Industries, Portland, Ore., believes the best way to make sure those numbers are valid is to integrate bidding and job costing.

Northwest feels its bidding process is what gives the company its competitive edge. Wathey's goal is a system that generates numbers at least 80 to 90 percent compatible between the

bidding and job costing.

"From the beginning, we wanted to be able to compare bid estimates with actual costs as the job progresses and learn from our experience," he notes. "Our problem was matching the actual job costs to the level of detail we used when we put the bid together. One answer was to simplify the bid proposals."

Composite vs. standard

For years, Northwest compiled its production rates and tried to break

them down by individual tasks for 700 to 800 maintenance accounts. "When we attempted to establish a production rate for a 21-inch mower, we had 70 route foremen sitting down at the end of a long, hot day figuring out how much time two or three guys spent mowing," Wathey explains. "The information just wasn't accurate, so we went to composite bids and used packaged production rates because they made more sense."

The composite rate is based on hours of labor by task and a standard hourly rate for the piece of machinery used. It is still difficult, however, to

'We bid the annuals like an interiorscaper would, with production schedules and man-hours based on how many people it will take to cover each season.'

—Jim Wathey
Northwest Industries

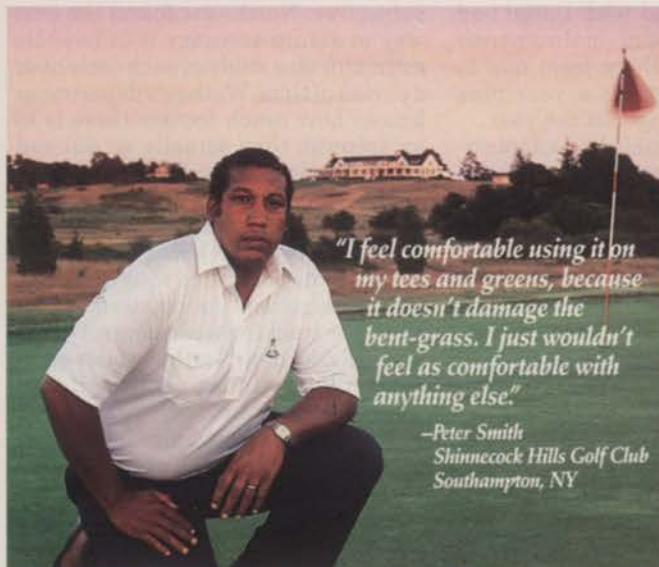
match bids to actuals for the 400 Portland and 300 Seattle lawn maintenance jobs which are 45 percent of Northwest's workload. That's because the company offers a full service package and charges a monthly rate.

Northwest has to estimate the costs of all the maintenance activities, match them with the size of area to be maintained, determine the type of equipment to be used and consolidate the figures to come up with a lump sum for that job.

Business parks like the Nimbus Technology and Koll Business Centers in Beaverton, Ore., have very similar edging, string trimming and mowing requirements and are physically alike enough so that Northwest doesn't have to measure every square foot of turf. They cluster these accounts by number of areas, total square footage and the type of machine to be used.

Standard production rates don't fit the wide open mowing areas at the Fujitsu America and Centerpointe properties. Here, Northwest uses more cost-efficient reel mowers so a different production rate is required. "If you've got wide open turf areas—25,000 to 30,000 square feet—you'll have a 30,000-square-foot production

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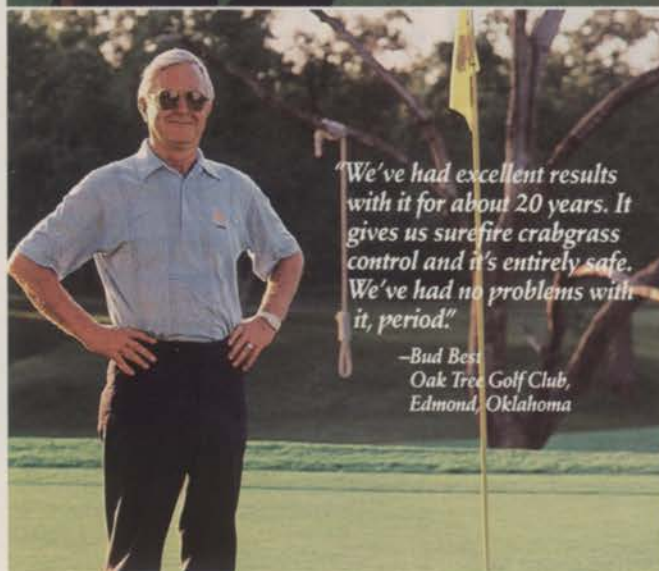
"I feel comfortable using it on my tees and greens, because it doesn't damage the bent-grass. I just wouldn't feel as comfortable with anything else."

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rate," Wathey says.

The mall factor

"Strip malls like those at Martinazzi Square in Tualatin, Ore., have a little patch of turf in front of each door. A standard production rate doesn't cover that situation either, so we do a composite on those. Also, when you're bidding a new account, the risk is always higher because you don't

grams for annuals and irrigation that require separate bids. The annuals program is packaged with initial bed prep installation and maintenance that includes anywhere from one to three or four plantings a year plus changing pots throughout the year.

"We bid the annuals like an interiorscaper would, with production schedules and man-hours based on how many people it will take to cover

year."

Maintenance job costing is more subjective. Northwest found the best way to assure accuracy is to have its estimator do a study of each crew over a period of time. Wathey's department knows how much footage there is in an account; they actually go out and track the people working at that account. That way, they get an estimate based on experience.

Basically, Northwest uses turf square footage and bed square footage for measurement as opposed to, for example, tracking weed control in the beds. In addition, Northwest has a category that includes all the oddball things people want.

"If a customer wants ornamental pruning, we keep track of those hours extra," Wathey says. "You can spend a lot of time pruning roses. Then there's bark dusting and, once in a while, people want us to paint bike stands."

Fully computerized

The main office in Tigard, Ore., handles all the financial accounting, job costing and purchasing functions on a DEC mainframe computer. The Seattle branch handles its own bidding and estimating using an IBM-compatible computer and Lotus spreadsheets. Even though the estimating process is not automated in Portland, Wathey maintains compatibility by using the same system manually.

According to Wathey, the computer makes bid preparation and job costing much quicker, particularly when he is reconciling bids with the actual expenses. The spreadsheet is



Business parks have very similar edging, weed eating and mower requirements, so it isn't necessary to measure every lineal foot of the turf-edged.

know the routine. However, it almost always evens out."

Other landscapers actually cost each of the activities to reach an estimate; some even take it farther and cost the job by size of area and type of soil. Each step incorporates labor, material, supply costs and equipment as well as the costs to transport it to the job site, but Wathey says it isn't cost-effective to develop a bid at that level of detail.

On the other hand, a "packaged" production rate is a little simpler. For example, if a project had 45,000 square feet of turf broken down into 40,000 square feet of wide open lawns and 5,000 square feet of small lawns, Northwest would bid it at 6.5 hours per "mowing visit." The "mowing visit" would be broken down into 3.0 hours on large mowers for the wide open space; 1.5 hours using 21-inch mowers on the 5,000 square feet; 1.0 hour for edging, blowing and clean-up; 0.5 hour to police the site for litter and weeds; 0.5 hour in travel time.

Month by month

Since Northwest's maintenance contracts are set up as 12 equal monthly payments, the computer bid format is designed to do the man/hour splits by month automatically as part of the estimate.

Northwest also has service pro-

grams for annuals and irrigation that require separate bids. The annuals program is packaged with initial bed prep installation and maintenance that includes anywhere from one to three or four plantings a year plus changing pots throughout the year.

Reliable numbers

After getting the job, Northwest budgets man-hours by month, based on the type of work during that season. Wathey also developed a data collection system that yields better figures at the job cost end.

"The difficulty was in making sure employees kept track of meaningful numbers. We tried timecards and the accounts payable module of their mainframe software system, but the laborers just couldn't handle it. Now, I have the foremen fill out worksheets by the job, and the numbers are a lot more reliable."

Supervisors use the time sheet for each account to track travel time and time spent on the job. At the end of every month, they get a rundown of how many hours they used on that account, versus what they bid. "It always has to be adjusted and then averaged over the year to see if they are on target," acknowledges Wathey. "We then give them a year-to-date total so they can see how they did for the

The best way to assure accurate maintenance job costing is the study each crew over time.

also more accurate. With a maintenance contract, there are a lot of exceptions based on the type of grounds and the type of work the customer wants done. Because of the way the spreadsheet is put together, it's hard to leave anything out of the bid.

"When we match the bid with actual costs, the information from the field is broken down by hours on the job," Wathey notes. "We also incorporate overhead into an hourly rate. We keep a record of how many chargeable production hours we have every year

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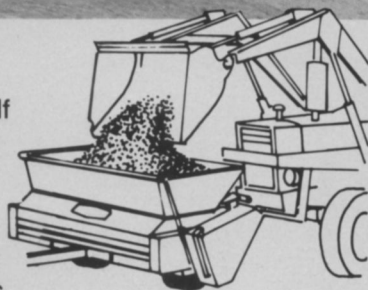
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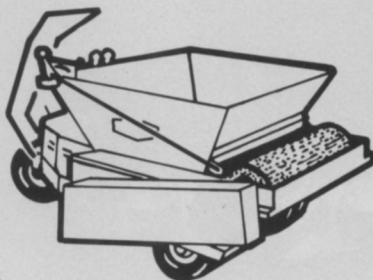
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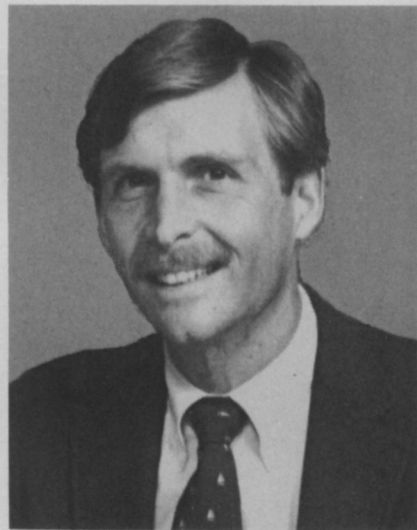
to figure out what kind of rate we need to charge to recover overhead and make a profit.

"Charges run 7, 10 and 12 percent based on the size of the account. The bigger the account, the less overhead."

Tracking material cost

Materials are kept track of separately. Every year Wathey develops an operating budget using historical records to determine square footage costs for materials. They don't keep track by account. It's all done at the fiscal budget level.

The materials management system is controlled by matching actual use against a budget prepared by supervisors when the contract is awarded. The exciting part is that the computer does all the calculations for them. "All I have to do is review it and see if it makes sense," Wathey says. "If a bid



"From the beginning, we wanted to compare bid estimates with actual costs."

is way off, we go back to the customer with the numbers on a computer print-out."

Over the next year, Northwest will be converting the Dec Vax and Rainbow PCs in Portland to an IBM 386 compatible network. "When we needed a computer in Seattle, we went with an IBM compatible rather than continue to invest money in obsolete equipment. By using the computer system, composite rates and turf routes, and doing good follow-up evaluation, we've had excellent experience matching our actual costs to our budget figures. Now we want the whole system integrated so we can take advantage of MSDOS landscape programs as well as our Lotus and WordPerfect programs," Wathey concludes.

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Portland's Tom McCall Waterfront Park is the highest use park in the city. Operational personnel there have instituted a system that successfully bridges the gap between those who enjoy the park and those who maintain it.

TRAFFIC DOESN'T DAMPEN BEAUTY OF PORTLAND PARK

To keep Tom McCall Waterfront Park looking good, Portland's Parks Bureau broke it into more manageable areas, established experimental turf areas and upgraded its maintenance practices.

Portland, Oregon's Tom McCall Waterfront Park is often referred to as the flagship of the city's parks system. The 26-acre park, located on the banks of the Willamette River in downtown Portland, is the city's highest use park, with major events scheduled throughout the summer drawing thousands of people.

The park is accessible to residents and visitors in the downtown area. Views of highrises to the west, the river and distant mountains to the east provide an exciting setting that blends urban

and pastoral scenery.

Festival time

The park is host to numerous annual festivals, including Cinco de Mayo in May, Neighborfaire and The Bite in July and weekly symphonies in August. In fact, there are 10 major events that draw between 50- and 100,000 participants from May through September, and many smaller events.

But the Portland Parks Bureau's Maintenance and Operations crews are constantly struggling to keep up with usage demands. For them, the

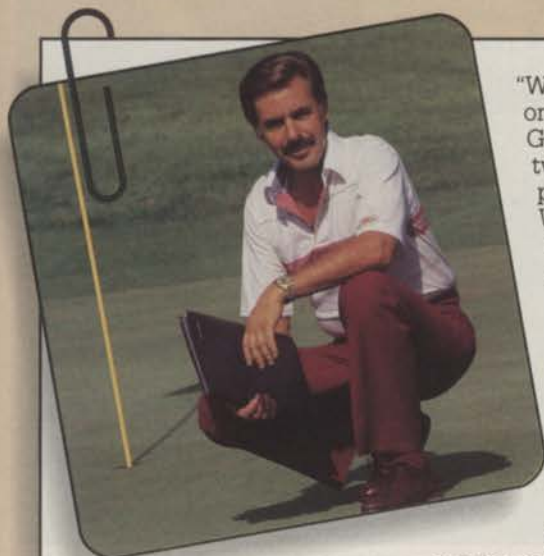
popularity of Waterfront Park has become too much of a good thing.

Over the last few years, the Parks Bureau has developed a variety of methods for dealing with this heavy use. These include establishing new user's fees, breaking the park up into more manageable areas, constantly updating maintenance procedures, and establishing experimental turf areas.

Crowds a problem

The event that draws the largest crowds and wreaks the greatest amount of devastation on the turf is

BENTGRASS

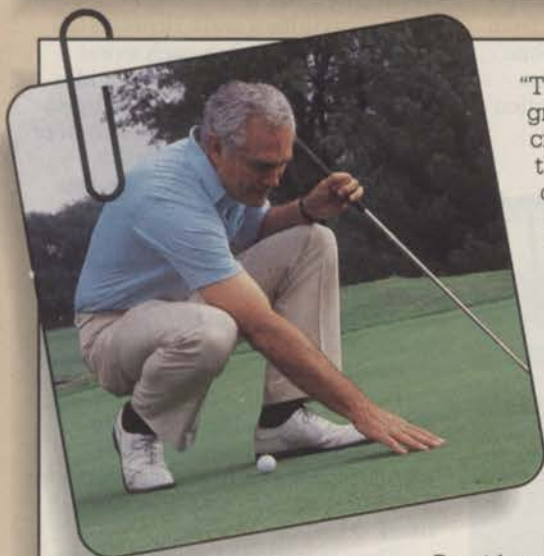


"We planted the 12th hole on Singing Hills' Willow Glen Course to SR 1020 two years ago, and it performed admirably. What's really significant is that members keep asking what we've done to the 12th hole that makes it putt so well! The members like SR 1020's performance from the players' point of view; we like that too, but we also value that we

haven't had to change our normal greens maintenance program to achieve the results."

David Fleming

David Fleming, C.G.C.S.
Superintendent, Singing Hills Country Club
El Cajon, CA



"The newer golf course greens planted to Penn-cross look beautiful, but they don't putt like the old South German Bent greens. The putting surface of those old greens is fine-textured, not thatchy or grainy, and the old greens don't show the spike marks like Penn-cross. We've been needing bent-grasses bred for golf quality as well as turf quality for a long time, and it

looks like SR 1020 and Providence fill the bill!"

Pete Trenham

Peter Trenham
President, Philadelphia Section PGA
St. David's Golf Club
Wayne, PA

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unquestionably the Rose Festival Fun Center, which runs for two weeks during the end of the area's rainy season. The festival uses more than half the park acreage and requires several days for set up and tear down. During these three weeks all irrigation is shut down.

Over one million feet and innumerable wheels from baby strollers can turn the turf into an oozing quagmire. If, on the other hand, there is no rain, the lack of irrigation results in compacted, dry, burned out areas.

When the last of the carnival is hauled away, the Parks Bureau has less than two weeks to repair the turf before the next major event, Neighborfaire. In the meantime, hundreds of people continue to use the park each day and smaller special weekend events draw thousands.

The first major part of the renovation process involves dragging a six-foot magnet over the turf to find bolts, nails, bottle caps, wire and other metal that might damage turf equipment or park users. This two-to-three day project "takes time but is a key function in our operation," according to Jim Carr, mowing and turf manager for the city.

Remove contaminants

After dragging the magnet, the parks crew removes any soil contaminated by oil, grease or hydraulic fluid which would kill the grass. They then aerate, topdress and overseed as needed.

Until very recently, park users paid a single permit fee (\$5) for which they could use any or all of the 26 acres and were supposedly responsible for cleaning up their mess. In reality



An experimental section of the park has a 20-inch deep sand medium under perennial ryegrass. A nearby sand sod field provides patches for repairs.

however, taxpayers picked up the bill for most renovation.

In January, 1989, all of that changed. The park was divided into seven sections and a new fee structure was instituted. Now, depending on the area used, the number expected and the activity planned, fees range from \$25 per day per section for a public event where no sales or profit are involved to \$500 per day per section where products will be sold or admission charged.

Under these new regulations, the Parks Bureau can now bill event organizers for any destruction of park property, such as costs for turf renovation and irrigation repairs.

Who pays for it

Carr schedules a walk through the area before and after each event with the event user. This provides the user and the Park Bureau up-to-date information on the condition of the Park, Carr says. The Parks Bureau then assesses the damages after the event and schedules the repair and renovation.

Because festival organizers know they will be accountable for damages, it is in their best interests to insure that vendors reduce damaging practices.

Breaking up the park into seven areas also allows the Bureau to schedule individual areas for maintenance and to assign events for areas best suited to a particular need.

The Operations Division works closely with the park permits desk to schedule open times for maintenance and repair activities in certain sections of the park when needed.

The park also contains a 4½-acre experimental section that has been developed for ease of maintenance year-round. "We needed a turf area



Following a major festival in mid-June, the maintenance crew drags a magnet over the turf to remove bolts, nails, bottle caps, wire and other metal.

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with good drainage for use during heavy spring rains and some compaction resistance for heavy traffic," Carr says. "We restored this section using specifications for a sports turf area, often referred to as the optimum high-use athletic field."

Sand base

The sports turf has a 20-inch deep sand medium, using granular pitrun sand (with most sand particles falling between No. 16 and No. 60 screen) with no organic material and no fines which would tend to lock up. Straight perennial ryegrass seed was sown onto the sand base. This results in much higher fertilization needs and supplementation with lime and micronutrients.



Too much of a good thing? The aftermath of Neighborfaire.

About twice a year the maintenance crews take soil samples to determine pH levels and nutrient deficiencies.

"We look for a well-balanced fertilizer, something that is geared for the acidic soil conditions west of the Cascades, usually a 6-1-3 or 6-1-4 ratio," Carr says. "We use a slow-release sulphur-coated fertilizer so we are able to put down sufficient nitrogen as well as phosphorus and potassium or N-P-K."

"Because of the high use, we feel it is important to have as many micronutrients as possible—iron, manganese, molybdenum, copper, zinc, boron—anything we can do to help revitalize the area."

Construction of this high-use turf began in 1986 and was completed in the summer of 1987. "It has become a very desirable area because it shows minimal wear and is kept fairly lush," Carr says. It is

scheduled for moderate use, such as the once-a-week Waterfront Classics that draw about 30,000 people.

The area can be irrigated the day before it is used because the drainage prevents standing water, Carr says.

Simple restoration

"And it is relatively easy to restore. By doing complete aeration and a light topdressing with overseeding a couple times a year, we're able to restore that area and get a good recovery within a week or 10 days after seeding."

To help maintain the sand-based turf, the bureau has established a straight sand sod field from which they can extract sod patches. This

*The reality is...
that the over-
scheduling of the
park is impossible
to deal with.*

allows the crews to fill in divots, voids and holes using the same sand medium. By not adding soil or other foreign organic matter, the purity of the turf is retained.

Adding regular sod with a sandy loam soil would cause the sand to lock up, forming an almost cement-like base, Carr says. "We've been able to move the sod without using netting or organic materials. We use a heavy seeding, roll it and then use it within a few hours. We've had excellent recovery—the grass patches take right off."

Carr has had good luck establishing the sod field. Within three months of seeding, the sod field can be cut and used as patches. "Grass on straight sand is working beautifully for us," he notes.

Due recognition

In November the Bureau and Waterfront Park received an award from the Oregon Parks and Recreation Society for excellence in maintenance, particularly under difficult circumstances. Considering the adverse conditions under which they work, Bureau personnel believe this recognition from their peers is indeed an honor.

"It's a very special award to us for a very special park," says Ron Maynard, acting director of Parks and recreation. "On a weekly basis we run the risk of loving it to death." **LM**

Maintenance of sand based turf

Many of the turf areas in Waterfront Park were developed 12 years ago with a sand base and sod containing several inches of loam topsoil. Over the years the combination has resulted in hard compaction on the surface with little drainage.

To break up this compaction, the bureau uses both core aeration and core removal aeration, depending on park scheduling. Shatter core allows aeration with minimum time between events.

After aeration, the turf is topdressed with a clean sand medium using a golf course greens-type topdresser to encourage drainage. The field is then dragged to break up aeration plugs. The topdressed area is then overseeded with straight perennial ryegrass.

"We're constantly changing our specifications, looking for the most drought-resistant, most wear-tolerant ryegrass available. Having the seed capital of the world here in Oregon, we're able to capitalize on the Washington and Oregon state field trials and have better accessibility to new seed varieties, says Jim Carr, mowing and turf manager for the city of Portland.

To control *Poa annua*, the Parks Bureau uses a selective spray such as Nor-Am's Prograss. This product also controls cheat grass, foxtail and other noxious weeds but doesn't affect perennial rye. Carr says the bureau has success with Prograss within two weeks after the seed drop and re-seeding with perennial rye.

"Fertilizing is perhaps one of the most important things we are able to do down there. We probably fertilize more often there than in any of our other parks, for both aesthetic purposes and to keep the turf well fed."

Carr notes, however, that they avoid fertilizing right after overseeding. Fertilizing too soon discourages full germination of the seed by encouraging rapid growth of existing grass which competes for nutrients and water and shades the new seeds.

"We like to wait until we get one- to two-leaf germination in the new seed before fertilizing," he says. □

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FIGURING THE COST OF FERTILIZER

Simple mathematics can tell you when it's a waste of money to apply additional fertilizer.

by S.T. Cockerham, University of California, Riverside

In most crops, fertilizer inputs are measured against yield; for important purchases, the cost is evaluated against return. This doesn't work in turfgrass management, for the simple reason that there is no measurable yield.

Sod producers sometimes try to compare growth rate and turf quality to fertilizer cost to determine when applying more fertilizer becomes a waste of money. But few growers are satisfied with the procedure.

Turfgrasses readily respond to nitrogen (N) fertilizers because N is frequently deficient. Usually a dramatic color response is followed by rapid growth. Once the turf color is as green as it can get, increasing the N rate continues to increase the turf's growth rate. At some point, however, the turf growth rate no longer increases as fast as the increase in nitrogen. That is when it is no longer cost-efficient to increase the N application rate.

Weighing clippings

One way to measure turf growth rate is to weigh the clippings removed at mowing. In Fig. 1, the clipping yield increases with increased nitrogen up to 4 lbs. per 1,000 sq. ft. when the rate actually causes a reduction in the clipping yield, therefore, a reduction in growth. Before that point the growth rate increase slows down with increased nitrogen.

For example, the growth rate increase in going from 0.5 to 1.0 lb. N is several times that measured going from 1.0 to 2.0 lbs. N. This means that fertilizer costs increase significantly for the small gain in growth rate.

In Fig. 2, the root and rhizome dry matter yield of Kentucky bluegrass drops off very significantly from 0 N to 0.75 lbs. 1,000 sq. ft./month. Over 0.75 lbs. the rate of root and rhizome growth nearly stops. Eventually, the roots reduce in number and length.

There are agronomic as well as economic upper limits to nitrogen fertilizer applications.

FIGURE 1. **CLIPPING YIELD RESPONSE TO NITROGEN**

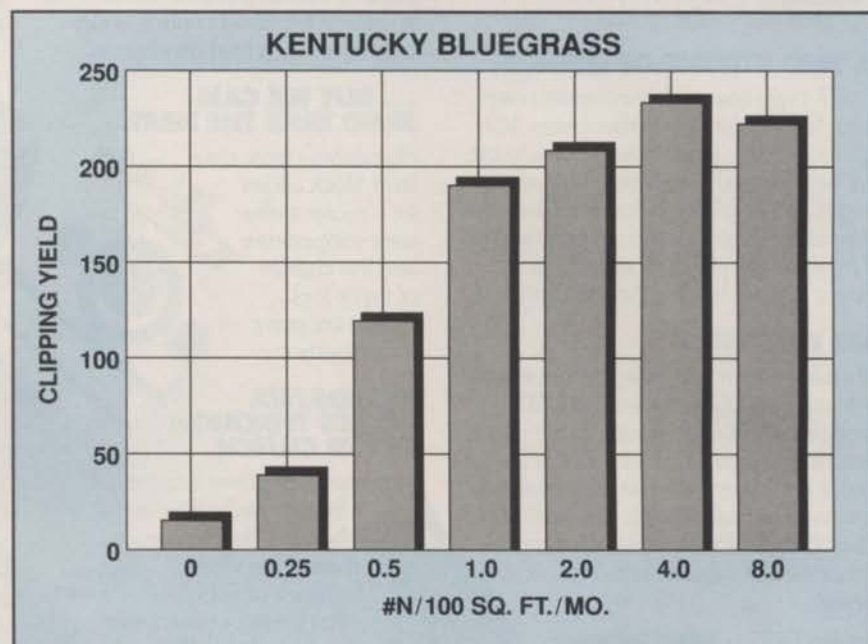
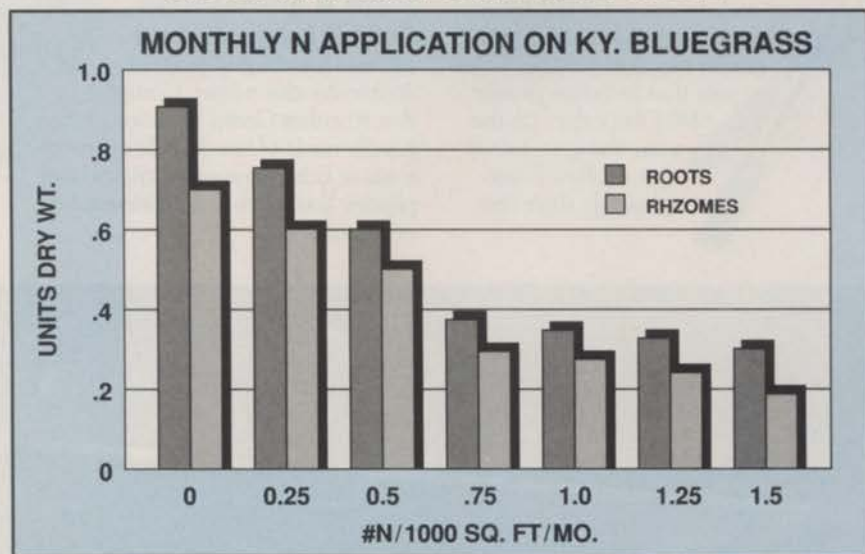


FIGURE 2. **ROOT AND RHIZOME RESPONSE**



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FIGURE 3.

COMPOSITION OF FERTILIZER MATERIALS

MATERIAL	NITROGEN % (N)	PHOSPHORUS % (P2O5)	POTASSIUM \$ (K2O)	LBS. N/TON	\$/TON	\$/LB/N
AMMONIUM SULFATE	21	0	0	420	\$150.00	\$.36
AMMONIUM NITRATE	33.5	0	0	670	\$288.50	\$.43
MONOAMMONIUM PHOSPHATE	11	40	0	220	\$360.00	\$1.64
AMMONIUM PHOSPHATE- SULFATE	16	20	0	320	\$299.60	\$.94
CALCIUM NITRATE	15	0	0	300	\$224.25	\$.75
UREA	45	0	0	900	\$260.00	\$.29
UREA FORMALDEHYDE	30	0	0	760	\$890.00	\$1.17
ISOBUTYLIDENE DIUREA (IBDU)	31	0	0	620	\$1000.00	\$1.61
UREA AMMONIUM NIRATE SOLUTION	32	0	0	640	\$190.00	\$.30
POTASSIUM NITRATE	13	0	45	260	\$560.00	\$2.15
SINGLE SUPER PHOSPHATE	0	20	0	0	\$253.00	
TRIPLE SUPER PHOSPHATE	0	45	0	0	\$349.00	
SULFUR COATED UREA	35	0	0	700	\$930.00	\$1.33
WHALE GUANO	9.5	6.5	2	190		

has been computed.

Ammonium sulfate (21-0-0) is listed at \$150 per ton and urea (45-0-0) is \$260.

Even though a ton of ammonium sulfate is less expensive than a ton of urea, the ammonium sulfate N is 36 cents per pound and the urea N is 29 cents. There is over twice as much N in urea (45%) than in the ammonium sulfate (21%).

A turf manager who has 50,000 sq. ft. of turf wants to apply one pound of N per 1,000 sq. ft. So it will take 237.45 lbs. of ammonium sulfate at a cost of \$85.50.

$$\text{lbs. fert./1000 sq. ft.} = \frac{1.00 \text{ lb. N/1000 sq. ft.}}{21 \text{ lb. N/lb. fert.}} = 4.75$$

$$\text{lbs. fert./50,000 sq. ft.} = 50 \times 4.75 = 237.5$$

$$\$50,000 \text{ sq. ft.} = 237.5 \times \$0.36 = \$85.50$$

It will take 110 lbs. of urea to put one pound per 1,000 sq. ft. on 50,000 sq. ft. of turf at a cost of \$31.90.

$$\text{lbs. fert./1000 sq. ft.} = \frac{1.00 \text{ lb. N/1000 sq. ft.}}{45 \text{ lb. N/lb. fert.}} = 2.2$$

$$\text{lbs. fert./50,000 sq. ft.} = 50 \times 2.2 = 110$$

$$\$50,000 \text{ sq. ft.} = 110 \times \$0.29 = \$31.90$$

In this example, even though the cost of urea is considerably higher per ton than ammonium sulfate, it is significantly less expensive to use. The turf manager is looking at \$85.50 to fertilize the area with ammonium sulfate or \$31.90 to use urea.

In Fig. 4, the cost of nitrogen per pound is shown graphically for several fertilizers as a comparison. Soluble fertilizers are the least expensive. Slow-release materials and those containing other nutrients are at the other end of the scale.

Fertilizer cost is an important factor in the buying decision. Unfortunately, getting the right fertilizer is not always as simple as using the cheapest N source.

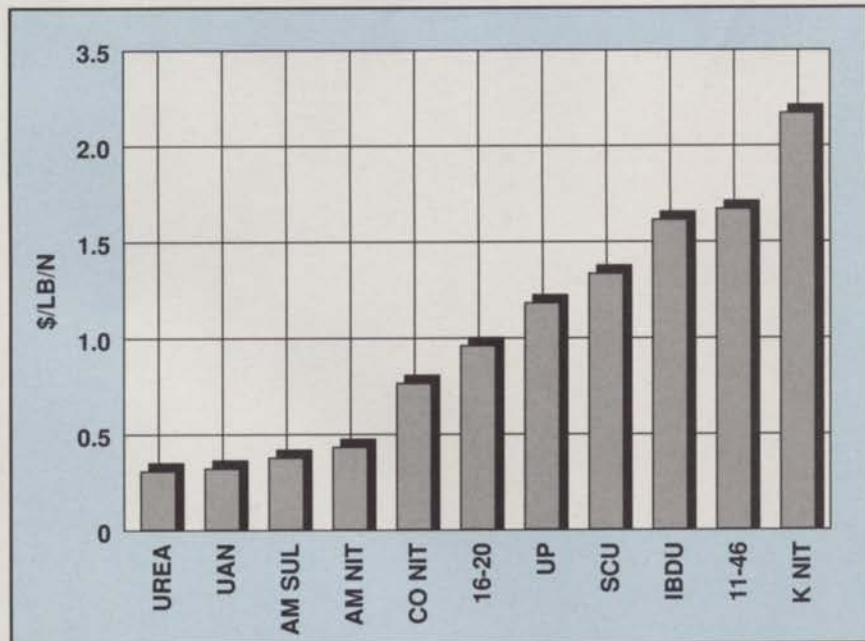
Ammonium sulfate provides sulfur as well as nitrogen. IBDU is a slow-release nitrogen source, which means a steady supply of N to the plants and few applications. Urea has a high N analysis so the turf manager handles less material. Monoammonium phosphate has available phosphorus. All of these are important considerations in choosing a fertilizer material.

Break-even analysis

In any business enterprise, at some point in the income and cost relationship there is no profit or loss. That is the point at which the operation will break even (BE). Obviously, one of the goals of a business is to operate at a profit, which is above the BE.

FIGURE 4.

COST OF NITROGEN IN FERTILIZER



Fertilizers are produced with a wide range of nutrient content. The nutrient analysis of a fertilizer is always shown as three numbers on a label representing the primary nutrients, nitrogen (N), phosphorus (P) and potassium (K), and always in that order. The numbers represent the percent by weight. Any other nutrients in the fertilizer will be shown elsewhere on the label.

Remembering analysis

A fertilizer analysis of 10-5-8 means

that 10 percent of the material's weight is N, 5 percent is P and 8 percent is K. If the fertilizer is in a 50 lb. bag, 5 lbs. is N (50 lbs. x 10% N = 5 lbs. N), 2.5 lbs. is P (50 lbs. x 5% P = 2.5 lbs. P) and 4 lbs. is K (50 lbs. x 8% K = 4 lbs. K).

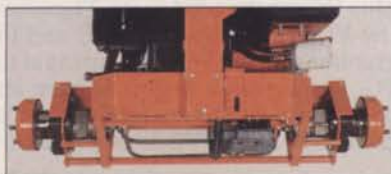
In Fig. 3, the composition of several commonly-used fertilizer materials is shown with the amount of nutrients present. The pounds of N contained in a ton of fertilizer is shown along with the cost of a ton of the fertilizer. In the last column, the cost of N per pound

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(Public organizations target break-even and do not wish to perform above that.)

The relationship of the BE to costs and fee revenue (sales) for a turf facility is shown graphically in Fig. 5. In this example, it is assumed that the information represents one year. Variable costs (VC) are the costs that are the most closely related to fee revenue.

Certain costs depend on the level of activity at that facility. Activities such as lawns serviced, rounds of play, number of games played, or sod sold affect supplies, labor hours, fuel and deliveries. These are variable costs.

When the activity level increases, the fee revenue increases and the VC

increases to meet the demand. When fee revenues go down, the VC must also go down, often a major management challenge.

Fixed costs (FC) are fixed for more than one year. They do not change regardless of the fee revenue or level of activity. FC includes management salaries, office rent, mortgage payments and equipment installments.

Graphing profit

The FC are shown as a straight line in the graph since they do not change. FC plus VC are the total costs. Therefore, the VC are on top of the FC and the graph shows the VC line starting at the FC. Fee revenue begins at zero and goes up since it has to total costs. The point where the VC line crosses the

fee revenue line is the BE. Notice how the two lines rapidly spread after the BE. This shows how quickly profits (revenue surplus) can build if VC are kept under control. If VC are allowed to increase, the BE will slide higher on the fee revenue curve.

The BE is useful for much more than determining the organization's profitability. It can be used to establish the actual cost of expenditures. The BE can be used to determine the actual cost to the organization of any supply purchase, new employee hire or equipment purchase.

In Fig. 6, the BE shown graphically in Fig. 5 is computed. The example uses the BE to cost out the purchase of a load of fertilizer.

The VC and FC are computed as percent of fee revenue by dividing each by the fee revenue dollars (shown as thousands).

$$BC\% = \frac{VC}{\text{Fee Revenue}} = \frac{764.5}{1300} = 58.81\%$$

$$FC\% = \frac{FC}{\text{Fee Revenue}} = \frac{415.5}{1300} = 31.96\%$$

The marginal ratio (MR) is a ratio of fee revenue to variable costs. It shows what is needed to cover the fixed costs and profit (surplus). The MR is calculated by subtracting the VC as percentage of fee revenue from 100 percent, which represents all sales.

$$MR = 100\% - VC\% = 100 - 58.81 = 41.19$$

The BE is calculated by dividing the FC by the MR.

$$BE = \frac{FC}{MR} = \frac{415.5}{.4119} = 1008.7$$

This facility would have to make \$1,008,700 in fee revenue to break even. Fee revenue over that level begins to accumulate profit.

A load of fertilizer costs \$5,000. By dividing the fertilizer cost by the MR the manager can determine how many dollars in fees must be made to pay for the fertilizer.

$$\text{Fees Needed} = \frac{\$5,000}{.4119} = \$12,138.87$$

It would take more than \$12,000 in fees to pay for a \$5,000 load of fertilizer. The true cost of expenditures can get to be quite high if variable costs are not controlled.

The actual cost of fertilizer is often inexpensive when compared to the benefits it can provide an operation.

FIGURE 5.

BREAK EVEN ANALYSIS TURF FACILITY

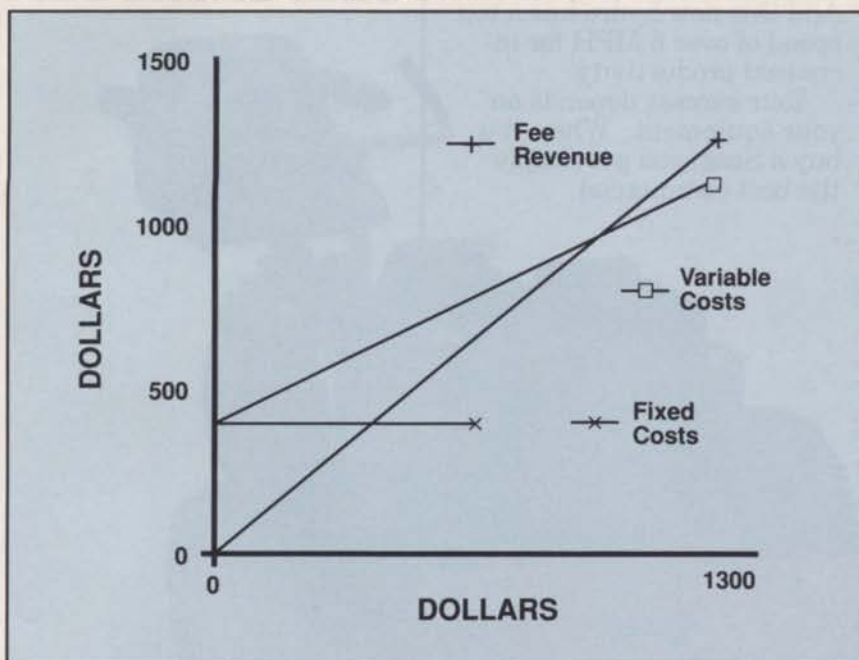


FIGURE 6.

BREAK EVEN ANALYSIS TURF FACILITY

	DOLLARS (1000) Of Fee Revenue	AS%
FEE REVENUE	1300	
VARIABLE COSTS	764.5	58.81
FIXED COSTS	415.5	31.96
MARGINAL RATIO*		41.19
BREAK EVEN (FC/MR)	1008.7	
* MARGINAL RATIO = % FEES AVAILABLE TO COVER FIXED COSTS AND PROFIT AFTER DEDUCTING % REQUIRED FOR VARIABLE COSTS (MR = 100% - VC%)		
TRUCK LOAD FERTILIZER @ \$200/TON		\$5000.00
FEES NEEDED TO BUY FERT. (COST/MR)		\$12,138.87



High Pointe GC in Traverse City has everything... heat, cold, snow, rain, wind, shade, traffic and *Oregon Grown Fine Fescue.*

High Pointe GC in the resort town of Traverse City, Michigan, is exposed to extremes of nature and man. This course demands a great deal from its turfgrass ... that's why it's wall-to-wall Oregon grown fine fescue.

Architect Tom Doak desired a links-type course with low maintenance qualities. Fine fescue filled that bill. Now, superintendent Dan Pillard finds that thousands and thousands of dollars have been saved establishing the turf, and in maintenance costs, over other species.

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USING DIRECT MAIL AS A MARKETING TOOL

A direct mailer may be one of the best marketing tools available to attract new customers in the landscape market.

by Ed Wandtke

Direct mail is often overlooked as a marketing opportunity, except by the most progressive of today's landscaping companies.

Many landscaping companies are sloppy in the way they use direct mail. They don't understand how to put it to work or the costs involved in building a program.

For those considering a direct mail program, it's important to note that your most likely new customer is probably living next door to one of your past or present customers. Therefore, a successful direct mail campaign will use these clients to help sell services.

Other factors need to be taken into consideration in order for a direct mail campaign to be a success in the green industry. For example:

Know your market. The direct mailer as used in landscaping differs greatly from one that might be used in lawn care. You probably don't have as many customers as a lawn care company, so you have the opportunity to analyze their situation more closely.

Get some idea of the income level and home value of the people you want to service. Whether you are in commercial or residential work, you have to be able to target those people you want to reach. This will help lower the cost of a direct mail campaign while increasing the possibility that it will be successful.

Find a market segment that offers the best chance of success. Once you know your market, concentrate your efforts there. It must be a geographical segmentation, but often it's a demographic one too. In demographics we look at age, home value and income as major variables in defining our "perfect" customer.

To find demographic information such as home value, age and income, work with a mailing company. Both local and national mailing companies have this type of information at a relatively low cost. Use it to examine addresses, income and home value in different parts of your locale. You may

MANAGEMENT



IN BUSINESS

be surprised to find that there are many people nearby who fit your customer profile.

Do a current customer profile. In order to locate your market segment, find out who has bought your services in the past. Potential clients who fit their profile are likely to be the ones who will respond positively to your direct mailing.

Don't limit yourself to geographical segmentation.

Strut your stuff. For artwork, use either your own renderings, blueprints or drawings, or pictures of some of your current landscaping jobs.

More than 80 percent of the buying decision is made through visual means. If you have a strong visual, use it. If it explains to the consumers what they will receive if they retain you, so much the better.

Don't be wordy. Most brochures contain too much copy. Your product is primarily visual, so show it to the customer.

Make an offer to the consumer. If you can't make an offer, there is no reason for the consumer to continue to look at your brochure. The offer can be to make the area around the home more livable and enjoyable.

Don't mail to too many people. Should you find a responsive audience, you need to be able to get to them fairly quickly for the first contact. The consumer will wait for your service after they have made the buy-

ing decision, but they don't want to wait for the first contact. If you mail too many brochures, you may find you can't service the leads quickly enough.

Be prepared to do multiple mailings. Multiple mailings are often necessary. If you send out your brochure once, you may not get a strong response. But by sending the same piece out again, you'll do little more than waste your money.

You may mail only a few hundred brochures in order to obtain enough business to keep you busy and growing. Because you aren't sending out thousands, as is done in lawn care, you should make sure that the brochure's quality is very high.

Remember that the key to successful direct mailing is to identify those people who are the most likely buyers. By combining a target market with a professional brochure, you can attract customers who would otherwise be unapproachable.

The landscape industry offers many opportunities for direct mailing. Because so little of it is done, the professional company using direct mail successfully is formidable competition in this young marketplace.

By properly targeting your audience with a high quality mailer, you'll be professional and profitable. **LM**



Ed Wandtke is a senior consultant with All-Green Management Associates, in Columbus, Ohio. He focuses on operations and financial questions.



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LANDSCAPE MANAGEMENT

1989 ARTICLE INDEX

Aeration: Room to Breathe

Terry McIver, January, p. 36

Arizona: On a Deserted Highway

June, p. 34

Athletic fields: Safe at Any Speed

Dr. John N. Rogers III, August, p. 40

Athletic fields: Warm-Season Calendar

Dr. John R. Hall III, January, p. 56

Atlanta Country Club: Weathering a Championship

May, p. 72

Bannockburn Lake Office Plaza

Will Perry, November, p. 20

Bio-Controls for the Green Industry

Dr. John D. Briggs, November, p. 30 and December, p. 34

Budgeting: How Will You Do?

Dr. Rudd McGary, March, p. 74

Chicago Botanic Garden

Will Perry, March, p. 84

Cleveland Hopkins Airport: Emergency!

Carl Kovac, February, p. 96

Containers and Winter Injury

Jim Borland, August, p. 30

Disease Control: Cool-Season Guide

Dr. Bill Shane, June, p. 48

Disease Control: Warm-Season Guide

Dr. Don Blasingame, June, p. 40

Diversification: One Step Beyond

Dr. Rudd McGary, February, p. 106

Dodgertown

Will Perry, May, p. 60

Drainage: the Unseen Killer

Dr. Ricks Pluenneke, March, p. 78

Employee Morale

Ed Wandtke, May, p. 82

Employee Retention

Ed Wandtke, June, p. 66

Employees: Are They Legal?

Richard I. Lehr, February, p. 90

Employees: Whither Comest the People?

Jerry Roche, October, p. 20

Engines: The Demand for Diesel

Dennis Bourgoin and Tom Kane, August, p. 45

Engine Training

Al Jacobsen and Ron Hansen, January, p. 86

Environmental Landscape Service

Will Perry, March, p. 110

Equipment Winterization

Jay Holtzman, November, p. 24

Estimating Strategy, The Importance of

Charles Vander Kooi, December, p. 36

Fairways of the Future

Will Perry, August, p. 24

Fertilization, A Guide to Turfgrass

Dr. Thomas R. Turner, March, p. 100

Gels, Wetting Agents for Trees and Shrubs

Dr. Terry Tattar, March, p. 88

Golf Course Superintendents

Will Perry, January, p. 30

Greens: No Speed Limit

Dr. Karl Danneberger, April, p. 66

Insect Control, Cool-Season Guide

Dr. Harry Niemczyk, April, p. 48

Insect Control, Warm-Season Guide

Dr. Pat Cobb, April, p. 38

Insect Control on Woody Plants

Dr. D.G. Nielsen and Dr. J.R. Baker, May, p. 44

Insecticides: Attacking from Within

Will Perry and Dr. Harry Niemczyk, March, p. 64

Irrigation: Blending Aesthetics

March, p. 94

Irrigation Idioms

Jerry Roche, January, p. 78

Kapalua Bay Golf Course

January, p. 82

Kent White Clover

R.E. DeGregorio and R.A. Ashley, February, p. 102

Kiahuna Golf Course

May, p. 42

Landscape Manager of the Year

November, p. 44

Low-Input Landscaping

Dr. W.M. Mitchell, January, p. 50

Landscapers: Survival of the Fattest

Terry McIver, February, p. 36

Mount Kenya Safari Club

Ann Reilly, January, p. 71

Mowers, New and Improved

February, p. 44

Mowers, Starting

April, p. 84

Mowing, Monitoring

May, p. 76

Newark: the Tradition Continues

Frank J. Sudol and Alvin L. Zach, February, p. 58

New York City Parks

July, p. 56

Nightlighting

January, p. 92

Oak Hill Country Club: U.S. Open

Ann Reilly, October, p. 26

Opryland: Paradise Under Glass

Terry McIver, February, p. 74

People, a Tree's Worst Enemy

Dr. Terry Tattar, January, p. 46

Planning for Progress

Terry McIver, July, p. 47

Planning for Succession

Ed Wandtke, July, p. 60

Pocket Guide to Management

various authors, October supplement

Pocket Guide to Seed

various authors, June supplement

Post-erizing Landscapes

Dr. Ronald C. Smith, February, p. 67

Productivity and Profits

Ed Wandtke, August, p. 62

Quail Hollow Resort: Wounded Bird

May, p. 78

Renovation Time

March, p. 38

Roadsides, The Best of

July, p. 34

Seed Report: The Harvest Is In

Terry McIver, October, p. 32

Sentry World's Watchdog

Jerry Roche, February, p. 82

Sod, A Stronger

Dr. J.R. Hall III, June, p. 60

State of the Green Industry

various authors, December, p. 18

The Stratford

Will Perry, January, p. 90

Tall Fescues for Urban, Dry Landscapes

Bob Morris and John Van Dam, July, p. 42 and August, p. 54

Trade Shows, Getting the Most Out of

Ed Wandtke, November, p. 50

Training Insurance

Dr. Lawrence Kokkelenberg, February, p. 52

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The Tree Challenge

Dr. Terry Tattar, July, p. 52

Trees: Where They Come From

Douglas Chapman, February, p. 76

Trimmers Come of Age

Terry McIver, April, p. 60

The Vandalism Game

Will Perry, April, p. 80

Water, Smart

Terry McIver, May, p. 36

Water Stress, Adventures in

Dr. Don Taylor, August, p. 48

Weed Control, Common Sense

Phil Christian III, November, p. 30

Weed Control: Cool-Season Guide

Dr. Tom Watschke, March, p. 44

Weed Control: Warm-Season Guide

Dr. Tim Murphy, March, p. 54

Wright-Patterson Golf Club

Jerry Roche, June, p. 28

Zoysiagrass, The Search for

Drs. Judy and Doug Brede, April, p. 72

CONTRIBUTING AUTHORS

Ashley, R.A.

Kent Outshines Common White Clover, February, p. 102

Baker, Dr. J.R.

Insect Control on Woody Plants, May, p. 44

Blasingame, Dr. Don

Warm-Season Turf Disease Control Guide, June, p. 40

Borland, Jim

Containers and Winter Injury, August, p. 30

Bourgoin, Dennis

The Demand for Diesel, August, p. 45

Brede, Dr. Doug

The Search for Zoysiagrass, April, p. 72

Brede, Dr. Judy

The Search for Zoysiagrass, April, p. 72

Briggs, Dr. John D.

Bio-Controls for the Green Industry, November, p. 30 and December, p. 34

Chapman, Doug

Where the Trees Come From, February, p. 76

Christian, Phil III

Common Sense Weed Control

Cobb, Dr. Pat

Warm-Season Insect Control Guide, April, p. 38

Danneberger, Dr. Karl

No Speed Limit, April, p. 66

DeGregorio, R.E.

Kent Outshines Common White Clover, February, p. 102

Hall, Dr. John R. III

Warm-Season Athletic Field Calendar, January, p. 56; A Stronger Sod, June, p. 60

Holtzman, Jay

Trimmers Come of Age, April, p. 30; Winterizing Equipment, November, p. 24

Kane, Tom

The Demand for Diesel, August, p. 45

Kokkelenberg, Dr. Lawrence

Training Insurance, February, p. 52

Kovac, Carl

Emergency!, February, p. 96

Lehr, Richard I.

Are Your Employees Legal?, February, p. 90

McGary, Dr. Rudd

One Step Beyond, February, p. 106; How Will You Do This Year?, March, p. 74

McIver, Terry

Room to Breathe, January, p. 36; Survival of the Fattest, February, p. 36; Paradise Under Glass, February, p. 74; The Politics of Water, April, p. 60; Smart Water, May, p. 36; Planning for Progress, July, p. 47; The Harvest Is In, October, p. 32

Mitchell, Dr. W.M.

Low Input Landscaping, January, p. 50

Morris, Dr. Bob

Tall Fescues for Urban, Dry Landscapes, July, p. 42 and August, p. 54

Murphy, Dr. Tim

Warm-Season Weed Control Guide, March, p. 54

Nielsen, Dr. D.G.

Insect Control on Woody Plants, April, p. 44

Niemczyk, Dr. Harry

Attacking from Within, March, p. 64; Cool-Season Insect Control Guide, April, p. 48

Perry, Will

Superintendents on Course, January, p. 30; Attacking from Within, March, p. 64; Learning While You Rest, March, p. 84; Doing It the Environmental Way, March, p. 110; The Vandalism Game, April, p. 80; The Dodgers' Other Manager, May, p. 60; Fairways of the Future, August, p. 24; East Meets West in Suburban Chicago, November, p. 28

Pluenneke, Dr. Ricks

The Unseen Killer, March, p. 78

Reilly, Ann

A Swinging Safari, January, p. 71; Open Heavens Can't Close Open Course, Octo-

ber, p. 26

Roche, Jerry

Irrigation Idioms, January, p. 78; The Sentry's Watchdog, February, p. 82; Coping with Construction, June, p. 28; Whither Comest the People?, October, p. 20

Shane, Dr. Bill

Cool-Season Turf Disease Control Guide, June, p. 48

Rogers, Dr. John N. III

Safe at Any Speed, August, p. 40

Smith, Dr. Ronald C.

Post-erizing Landscapes, February, p. 67

Tattar, Dr. Terry

People, a Tree's Worst Enemy, January, p. 46; Gels, Wetting Agents for Trees and Shrubs, March, p. 88; The Tree Challenge, July, p. 52

Taylor, Dr. Don

Adventures in Water Stress, August, p. 48

Turner, Dr. Thomas

A Guide to Turfgrass Fertilization, March, p. 100

Van Dam, Dr. John

Tall Fescues for Urban, Dry Landscapes, July, p. 42 and August, p. 54

Vander Kooi, Charles

The Importance of Estimating Strategy, December, p. 36

Wandtke, Ed

Keeping Them Happy, May, p. 82; Employee Retention, June, p. 66; Planning for Succession, July, p. 60; Boost Productivity and Profits, August, p. 62; Getting the Most Out of a Trade Show, November, p. 50; State of the Green Industry, December, p. 18

Watschke, Dr. Thomas

Cool-Season Weed Control Guide, March, p. 44

LETTERS From page 28

should be of interest to your readers, but I found many errors in the article.

In reference to Devine, I would add that the University of Florida program that developed the fungus *Phytophthora palmivora* for use as a mycoherbicide against milkweed vine on citrus trees was so successful that the market for Devine declined because the fungus remained active in the soil. An example of a

in the soil. An example of a more widely used mycoherbicide is the Upjohn product Collego (the fungus *Collectotrichum gloeosporioides* f. sp. *aeschynomene* developed at the University of Arkansas) which is used to control northern jointvetch in rice and soybeans.

**Gordon E. Holcomb,
Ph.D.**
Louisiana State Univ.

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Circle No. 221 on Reader Inquiry Card

Superintendents: What they do best

According to a LANDSCAPE MANAGEMENT survey, golf course superintendents do what's necessary to keep the course running well, are well paid (and are paid for overtime), and receive proper medical and dental benefits.

All 34 of the superintendents interviewed for the survey provide weed and insect control and aerate their courses regularly. Disease control, mowing and fertilization are performed at 97 percent of their courses. Ninety-four percent use an irrigation system, and 85 percent perform in-house renovations. An even 50 percent practice aquatic weed control, either chemically or by using aerifiers.

The average land taken up by a U.S. course today 143.5 acres.

Unless they're all trying to feed families of eight, superintendents' pay is staying competitive. Average salary for 1989 is \$30,720. The majority (25 percent), are paid between \$20,000 and \$24,999. Twenty-two percent receive between \$25,000 and \$29,999. An elite three percent are paid at or above \$60,000.

Liability insurance is one of the factors cited by superintendents as affecting profitability. It's no wonder.

Pat Jones, director of communications for GCSAA, says liability insurance costs are rising, "especially when attached to golf cars, or things

that typically might result in litigation, whether justified or not."

The good news on the benefit front is the coming trend toward portable pension plans, as cited by the survey.

Jones says the pension's lack of portability has been a problem in many professions. Usually, a pension must be cashed in by the employee should he change jobs. That requirement may change.

"What we and a lot of small business are working with Congress to do," Jones says, "is create a system by which employees who change jobs more frequently would be able to take their pension plans with them, like a portable IRA."

LM

Superintendents cite factors affecting their profitability:



liability insurance	80.0%
equipment upkeep	80.0
employee benefits	70.0
other insurance	66.7
govt. regulations	36.7
employee turnover	36.7
inflation	26.7
accounts receivable	23.3
salary increases	23.3
customer turnover	16.7
none/no answer	13.3

Optimistic/pessimistic outlook for golf industry for 1990s:

PESSIMISTIC

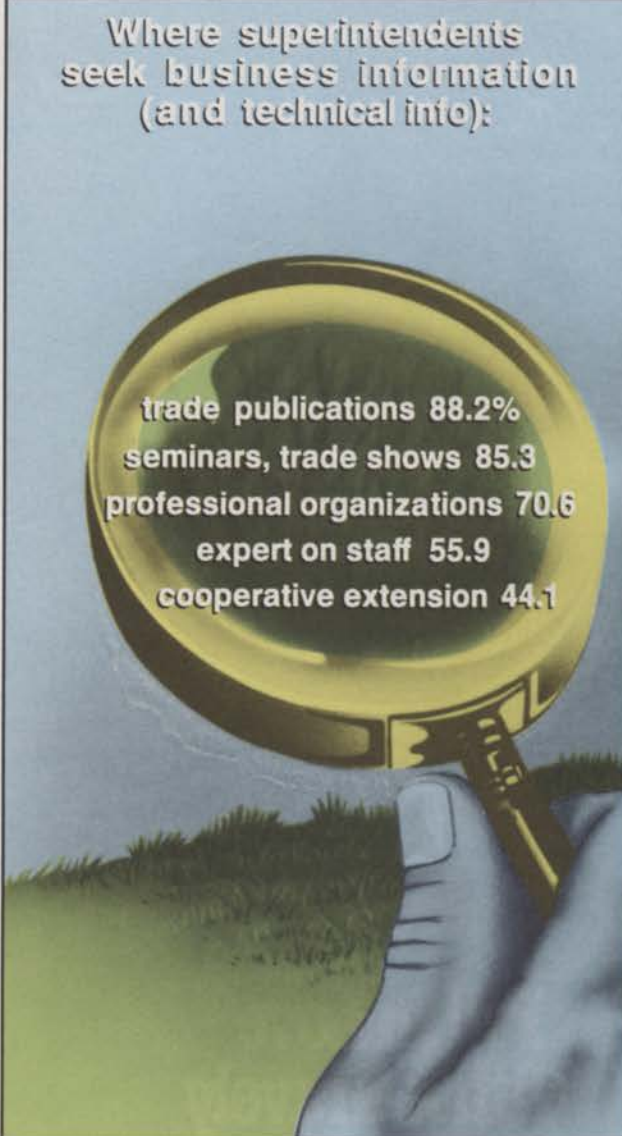
OPTIMISTIC

8.4

mean

1 2 3 4 5 6 7 8 9 10

Where superintendents seek business information (and technical info):



trade publications	88.2%
seminars, trade shows	85.3
professional organizations	70.6
expert on staff	55.9
cooperative extension	44.1

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Its totally integrated power train and new hydraulically-powered steering gives you unmatched performance over the long run. The 807 dispatches thick, wet grass on tricky maneuvers around obstacles without losing

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year 'round. Choose a 3 or 4 wheel design with 60- or 72-inch side or rear discharge mower deck. Or add the exclusive Cushman Grass Caddy™ system, which lets you cut, catch, and hydraulically dump 16 bushels of clippings without leaving the seat.

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Circle No. 106 on Reader Inquiry Card

PRODUCTS

Solar-powered light is wireless, work-free

The Light Fantastic is a totally stand alone, wireless, solar-powered lighting unit. It can be adjusted to glow brightly during the evening or softly throughout the night. Light Fantastic absorbs sunlight during the day and creates a soft glow from dusk onwards.

The units can be used in groups or individually, and are easily moved



from place to place as the seasons change.

Circle No. 191 on Reader Inquiry Card

Safety wear catalog for multi-applications

Bata Shoe Co. has a new catalog available highlighting its line of industrial, waterproof protective clothing and footwear.

Bata says it has a commitment to safety excellence that begins in the research stages and continues through design and production.

Circle No. 192 on Reader Inquiry Card

Blue colorant can be used as lake dye, spray indicator

Drane Supply Co. of Louisville, Ky. has produced what it says is the first blue colorant to be labelled for use as a liquid lake dye and as a spray pattern indicator.

The product is called Aqua-Turf. Drane reports that when used in ponds, Aqua-Turf shades sunlight for the control of algae and aquatic weeds, as well as enhancing lake appearance with a natural looking blue color.

One gallon treats up to an acre of

water four to five feet deep and lasts for up to several weeks.

For spray pattern indicator use, Aqua-Turf is applied at the rate of 8 to 14 ounces per acre. It leaves a temporary blue color that gives grass a deeper green appearance.

Drane says Aqua-Turf is harmless to all forms of animal and vegetable life, and does not affect the performance of any turf chemicals.

Circle No. 193 on Reader Inquiry Card

Attachment is adaptable as a scraper and loader

The D.W. Scraper is a new heavy-duty truck attachment that fits on a 3-point hitch as a scraper or end-loader.

It has two, 2½ x 18-inch cylinders controlling the bucket. The change from scraper to end-loader is accomplished by changing six bolts on each side.

Sources say the tool can be used to finish grading around buildings, building ponds and terraces, leveling driveways and more.



Circle No. 194 on Reader Inquiry Card

New line of attachments for mowers and tractors

Attachments Plus of Spring Lake, Mich., now offers rugged, lightweight attachments for front mowers and tractors with 3-point hitches.

In less than five minutes, an operator can change from an adjustable fork set for moving balled trees to a



tote platform for transporting shrubs, or to a large half-yard hopper for hauling bark or debris.

The product line features an aluminum clam shell hopper and scoop along with a steel fork set, tote platform bracket kit and tool organizer. One person can easily change attachments thanks to quick release pins.

Circle No. 195 on Reader Inquiry Card

New nursery fabrics provide great cover

Two new non-woven fabrics are available to nurserymen as part of an expanding Agryl System of protective covers for horticulture and agri-



culture from American Agrifabrics.

Both Agryl products are soft, breathable, non-abrasive materials available in narrow and wide widths.

Agryl P-30 is a medium weight cover at 0.9 oz./sq.yd. It offers freeze protection down to 26°F, and is recommended for late spring freezes on ferns, foliage and container stock.

Agryl P-50 is heavier, at 1.5 oz./sq.yd. Its use is recommended for harsher growing conditions, and provides freeze protection down to 24°F. American Agrifabrics says P-50 is also ideal for overwintering in single or double layers, or coupled with white poly film.

Circle No. 196 on Reader Inquiry Card

Research license available for tree tie-down system

A tie-down system for supporting newly-planted trees is available for licensing to manufacturers interested in research and development.

Safe Way Tie-Down anchors trees to promote improved growth, according to the Invention Submission Corporation (ISC). ISC says the unit allows for more attractive landscaping without unsightly stakes. Designed for optimum safety, the system eliminates the risk of stumbling over above-ground stakes and running into virtually invisible support lines.

ISC reports that the design sub-

Here's proof that Typar Pro Landscape Fabric is easier to install.



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REEMAY
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stantially reduces the aggravation of mowing the lawn around supported trees.

Circle No. 197 on Reader Inquiry Card

Line of power tools grows; now totals 17

New product additions have been completed by EasyRake, Inc. The line now includes 17 models of dethatchers, vacuum carts and sprayers.

"Major expansion of our product line from our traditional base of high-performance dethatchers led us to take a similar step forward with appropriate changes in our product name and the development of a new-look, corporate logotype and symbol," says Jerry Jones, president.

The addition of a 40-cubic foot Model 86 and a six-bushel Model 344 lawn vacuum brings to twelve the number of self-powered tractor-mounted and trailer-mounted units.

The EasyRake Model 84 trailer-mounted sprayer features 13-gallon capacity and complements the 13-gallon tractor-mounted Model 82 and the 30 gallon trailer-mounted Model 88 for residential and commercial spraying.

Circle No. 198 on Reader Inquiry Card

New catalogues describe vacuum, blower products

Atwater Strong Inc. of Akron, Ohio, offers a new 18-page booklet detailing its various vacuums and blowers.



Trade names for Atwater products are Lo-Blo, the Air-Broom, Lit-R-Blo and Mi-T-Vac. Commercial units are used by groundskeepers, lawn care professionals, landscapers, parks,

schools and cities.

Circle No. 199 on Reader Inquiry Card

Watch for improved variety of Clemfine

Bob Mazur of Clemson University is currently researching to breed an improved stand of Clemfine tall fescue in five years.

Mazur says he is not trying to replace Clemfine, but rather to incorporate additional plant characteristics to fill a new market niche.

Those characteristics are greater dwarf growth, finer leaf texture and darker color, along with Clemfine's well-known disease tolerance.

Major markets for tall fescue in the Southeast include Atlanta, Charlotte, N.C. and Birmingham, Ala. "Here at Clemson," says Mazur, we're in an ideal location to screen for improved tall fescue varieties. We've got the same climate and disease problems."

Mazur's research begins with screening plant ecotypes and selecting germ plasms from disease resistant varieties.

Circle No. 200 on Reader Inquiry Card



One-Pass Mowing & Clean-Up

Mow and power vac at the same time with Goossen's new 128 cu. ft. capacity Vac 'n' Load. It can be used with virtually any front deck or mid-mount mower, and is also ideal for fast fall leaf pickup. And when the job's done, it tilts up for easy dumping.

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Pressure washer line has variable sprayer

The Jet-Pro Model JP-3015 by Jetter Corp. has a variable pattern spray tip and two-piece wand for easy accessorizing.

Jetter says the Jet-Pro operates at



1500 psi, a full 3 gpm, and retails for hundreds of dollars less than comparable models.

Circle No. 201 on Reader Inquiry Card

Tree spade maximizes transplanting capability

Vermeer has produced what it says is the world's largest mechanized tree mover.

The 9400 Tree Spade can handle trees with a 94-inch diameter. It mounts on a truck with a minimum

GVW rating of 58,000 lbs. The unit weighs 22,500 lbs., and features a heavy duty hydraulic drive system with chain reduction assist. Four spoon-shaped spades reach a depth of 65-inches. Each spade applies a digging force of 42,000 lbs. at the point. Giant anchor plates press the ball securely in position during transport.

The front of the truck bed holds approximately 450 gallons of water which lubricate the tree ball and spades while digging.

Maximum ball weight capacity is 12,000 lbs.

The tree digging and lifting opera-



tion is all hydraulically controlled from a single operator station which is located next to the spades for maximum visibility.

Circle No. 202 on Reader Inquiry Card

New wall system is mortarless

A new concrete block landscape retaining wall system has been introduced by Allan Block Corpora-



tion of Minneapolis.

According to the company, the system requires no mortar or stabilizing pins, and can be used in a wide variety of soil and site conditions for residential, commercial and municipal applications.

The secret to the system is a raised lip on the front upper edge of each block which allows blocks to interlock as they are stacked. Walls are formed by placing the first row of blocks in a shallow trench, stacking additional rows on top against the lip, and backfilling behind each row.

Allan Block retaining walls may in-



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Circle No. 134 on Reader Inquiry Card

corporate inside and outside curves, multi-levels, landscaping pockets, angles, corners and stairs. Blocks are available in a variety of colors.

According to designer and company founder Robert Gravier, Allan Block has the durability of landscape boulders or stone, but without the weight and difficult installation.

Circle No. 203 on Reader Inquiry Card

Goosegrass is a goner from bermudagrass turf

Sencor 75 Turf Herbicide from the Mobay Corporation is reported to be highly effective in the control of goosegrass in actively growing Bermudagrass turf.

Applied prior to green up per label directions, Sencor 75 will also effectively control such broadleaf weeds as common chickweed, corn speedwell, henbit, parsley-piert and spur weed.

It mixes with water and may be applied with any conventional tank type sprayer. Mobay says that usually, one application, and never more than two, will provide season-long control.

Circle No. 204 on Reader Inquiry Card

Clipping pickup made easy thanks to new deck design

A new "top flow" deck design for the Cushman Front Line mower vastly improves the collection of clipping and debris when mowing.

The new deck features a grass propulsion impeller as an integral part of the deck design. The replaceable impeller blade operates on the same



spindle as the right-hand cutting blade.

According to Cushman engineers, most grass collection systems rely on air drawn in from under the edges of the mower deck. The "top flow" deck is designed with air inlet passages that allow positive air flow even when the mower is operated low to the ground in wet turf.

A tunnel-shape provides an open, straight path for clippings and debris. This, says Cushman, minimizes the chance of plugging from twigs, pine cones or other types of debris.

Circle No. 205 on Reader Inquiry Card

Broad spectrum control, no residual soil activity

Roundup herbicide from Monsanto controls more than 110 kinds of emerged weeds, roots and all. If you've needed more than one herbicide in the past to control weed problems, Monsanto says Roundup can help.

Roundup works in the plant and not in the soil. That, according to Monsanto, means it has no residual soil activity, so it won't wash or leach out to harm nearby desirable vegetation.

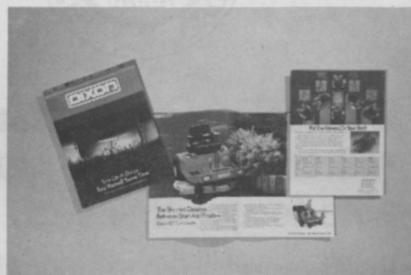
It is ideal for trimming and edging around shrubs and flower beds, around trees and other valuable ornamentals.

Circle No. 206 on Reader Inquiry Card

New lineup of mowers features many widths

Dixon Industries, Inc. has presented its 1990 Zero Turning Radius riding lawn mowers. They range in size from the ZTR-304 with a 30-inch cut to the surprisingly compact commercial grade ZTR-502.

Speed, steering and direction are controlled by two hand levers. The 30-inch, 36-inch and 42-inch models rely on Dixon's patented transaxle.



The ZTR-502 features a piston-type hydrostatic drive, an 18-hp Kohler engine and a special patented suspension to reduce vibration.

The narrow swaths of the ZTR-304 and the ZTR-312 permit these 30-inch cut mowers to move freely in close-planted areas.

Circle No. 207 on Reader Inquiry Card

New utilitruck is now here for the new year

Columbia ParCar Corporation introduces the 1990 Columbia Utilitruck.

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12,821	AQUA	17,322	MEAT PROCESSING
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Columbia ParCar Corporation says the Utilitruck is perfect for light industry, agriculture and turf care.

The Utilitruck is a rugged, all-purpose vehicle, and may be customized to fit any of your special needs.



Circle No. 208 on Reader Inquiry Card

Tough on weeds, gentle on grass

Acclaim 1EC herbicide from Hoechst-Roussel Agri-Vet Company is tough on grassy weeds, yet gentle on cool season turfgrasses. Acclaim can be used when no pre-emergence product can because it controls weeds after they have germinated.

The produce controls or suppresses crabgrass, goosegrass, barnyardgrass, foxtail sp., panicum sp., Johnsongrass and sprangletop. Acclaim is cleared for use on turfgrass, Kentucky bluegrass, perennial ryegrass, fine fescue, tall fescue, annual bluegrass, zoysiagrass and bentgrass.

Circle No. 209 on Reader Inquiry Card

New line of grass cutters ready for springtime

Simplicity Manufacturing, Inc. has introduced a complete line of commercial grass cutting machines. The line includes six riding models, two mid-size walk-behinds and two trim mowers.

"The front cut models feature a zero-turning radius that gives operators great maneuverability around and under obstacles common to parks,

building sites and large rural lots," says Warren Frazier, president and chief executive officer.

A patented hydro steering design features dual hydrostatic drive that allows the units to pivot in a full circle



around either drive wheel. Models are available with a lever or exclusive steering wheel design. Moving the steering wheel 40° turns the units a full-360°.

Options include dual tail wheels and grass catchers.

Circle No. 210 on Reader Inquiry Card

High performance engines power commercial mowers

The Toro Company has added two new high performance Kohler en-

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trols the cutting reels. One pedal controls the forward and reverse speeds and the braking. It's that simple.



For all-purpose mowing, there's nothing as agile as the Reelmaster 216 from Toro. It's a great way to steer clear of trouble. For a demonstration, call your local distributor or contact Toro at the address below.

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Circle No. 158 on Reader Inquiry Card

BOOKSTORE



410 - DISEASES & PESTS OF ORNAMENTAL PLANTS

by Pascal Pirone

This standard reference discusses diagnosis and treatment of diseases and organisms affecting nearly 500 varieties of ornamental plants grown outdoors, under glass or in the home. Easy to understand explanations of when and how to use the most effective fungicides, insecticides and other control methods. **\$37.95**

415 - INNOVATIVE APPROACHES TO PLANT DISEASE CONTROL

by Ian Chet

Brings together alternative approaches and methods that have potential to control diseases caused by fungi, bacteria and viruses. Major concepts of disease control discussed include biological control systems, their possible mechanisms, potential application and genetic improvement. **\$52.50**

800 - THE GOLF COURSE

by Cornish and Whitten

The first book ever to give the art of golf course design its due, and golf course architects the credit and recognition they deserve. 320 pages and 150 color and black and white photographs. Traces the history and evolution of the golf course, analyzes the great courses, shows how they were designed and constructed. **\$35.00**

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Essential information for identifying more than 650 insect pests and the injuries they cause. More than 200 color illustrations. **\$49.95**

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by Lori Thomson Harvey and W.T. Thomson

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010 - ADVANCES IN TURFGRASS PATHOLOGY

by Joyner and Larsen

Leading U.S. turf pathologists report on turfgrass diseases, pythium blight, snow molds, fairy rings, leaf spot of Kentucky bluegrass in Minnesota, initial field fungicide screening, turfgrass disease resistance, etc. Contains new ideas on how to combat turfgrass problems. **\$27.95**

235 - LAWN CARE: A HANDBOOK FOR PROFESSIONALS

by H. Decker, J. Decker

Written by turfgrass professionals, this handy guide will be invaluable for playing field managers, golf course managers, or any lawn care practitioner. Covers all aspects of turfgrass management. **\$36.00**

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620 - TURF MANAGEMENT HANDBOOK

by Howard Sprague

Practical guide to turf care under both healthy and poor turf conditions. Chapters cover turf in cooler and warmer regions, fertilizer use, regular turf care, weed and disease control and special turf problems. Useful seasonal schedules for management of turf areas. **\$25.25**

220 - CONTROLLING TURFGRASS PESTS

by Shurtleff, Fermanian, Randall

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by James Watkins

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by James Beard

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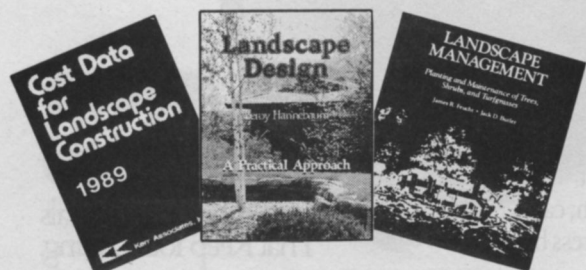
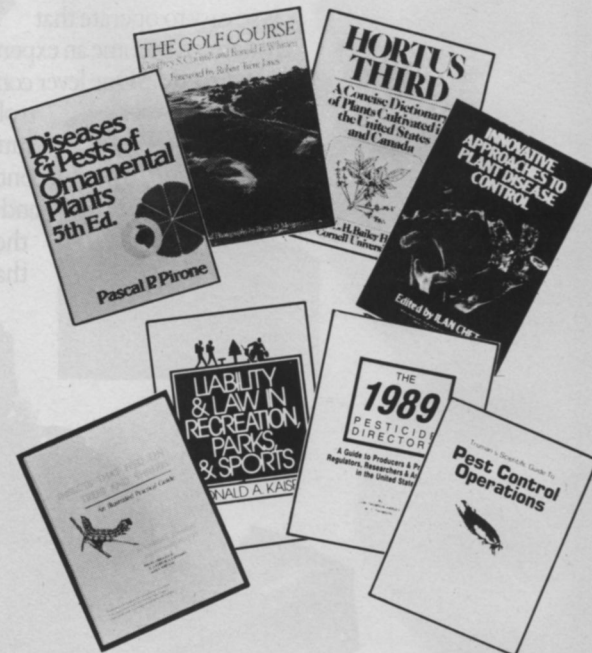
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Kathleen W. Kerr, Editor

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gines to its ProLine mid-size mowers. The engines are a 14-hp OHV Command and 16-hp Magnum Twin. Both are available with 36-, 44- and 52-inch deck options.

Toro says the Kohler Command 14-hp OHV engine provides extra cutting power for tough mowing applications. It features full pressure lubrication and hydraulic valve lifters for long life. Laminated steel packaging and a large multi-chambered muffler decrease engine noise. An optional electric start kit is available.



The Magnum 16-hp twin cylinder

engine features excellent torque for extra lugging power in tough cutting conditions. More than two acres/hour can be mowed with the 52-inch deck. Other improvements for 1990 include: low profile 5-gallon gas tank; a shorter handle for easier storage and trailering; and a new 4-speed transmission with sealed bearings for longer life.

Circle No. 211 on Reader Inquiry Card

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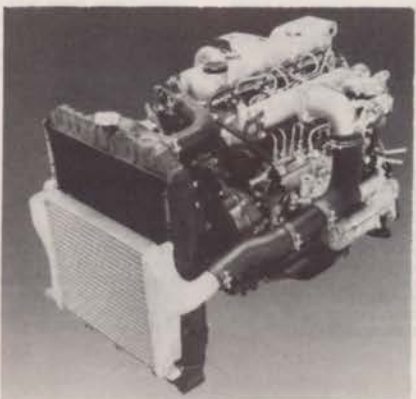
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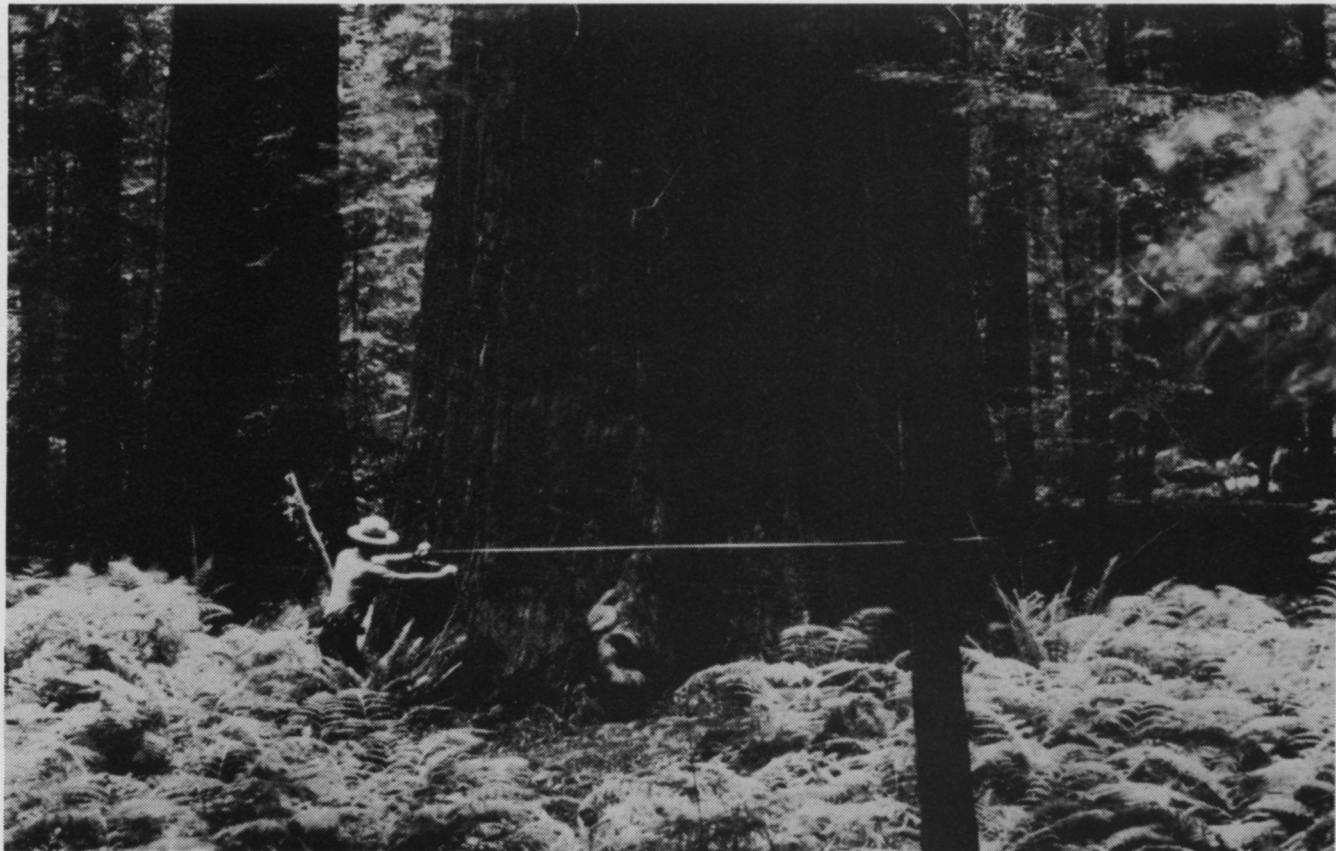
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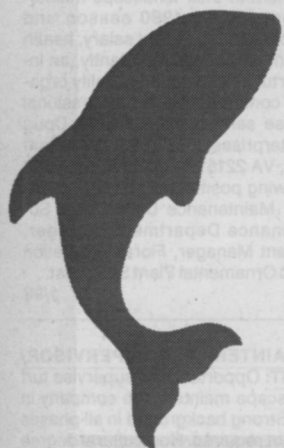
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EOE M/F

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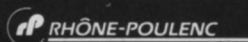
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NO. ADVERTISER	PAGE NO.	NO. ADVERTISER	PAGE NO.
101 ATI Corp.	32	135 Mitsubishi Motor Sales of America, Inc.	23
165 Aquatrols Corp. of America	36	136 Mobay Corp.	44-45
102 Barebo, Inc.	105	137 National Mower Co.	111
103 Bunton Co.	19	138 Nor Am Chemical Co.	73
104 Ciba Geigy Corp. ...	2-3	139 Northrup King Co. ...	81
105 Cushman	13	140 Olathe Manufacturing, Inc.	100
106 Cushman	93	261 Onan Corp.	27
297 Cushman	49	141 Oregon Fine Fescue Commission	85
108 Deere and Co., John	6-7	142 PBI Gordon Corp.	30-31
109 Ditch Witch	57	143 Pickseed West, Inc.	20-21
116 Elanco Products Co./ Balon	43	144 Ransomes, Inc.	77
110 Elanco Products Co./ Cutless	14-15	145 Reemay Inc.	95
115 Elanco Products Co./ Gallery	38-39	275 Rhone Poulenc Ag Co./ Sevin	113
112 Elanco Products Co./ Reemay	52-53	146 Rhone Poulenc Ag Co./ Ronstar	47
111 Elanco Products Co./ Surflan (Regional) ...	115	147 Rhone Poulenc Ag Co./ Chipco	24-25
114 Elanco Products Co./ Surflan	CV3	148 Ringer Corp.	41
113 Elanco Products Co./ Team	65	149 Sandoz Crop Protection Corp.	87
117 Excel Industries, Inc.	37	153 Scag Power quipment	83
118 Finn Equipment	104	150 Scott Proturf, O.M.	58-59
119 Fuerst Brothers,	12	151 Seed Research of Oregon, Inc.	75
120 GCSAA	109	154 Shindiawa	79
121 Goossen Industries ...	96	292 Simplicity Manufacturing, Inc.	71
122 Grasshopper Co. ...	64	155 Spraying Systems, Inc.	55
221 Gravely International, Inc.	91	291 Stanford Seed Co.	16-17
220 Howard Price Turf Equipment	67	157 Tee 2 Green Corp.	CV2
125 ICI Americas, Inc. ...	69	158 Toro Co.	101
126 International Seeds, Inc.	29	161 Toyota Motor Sales, USA, Inc. (Reg.)	99
127 Jacobsen Div. of Textron	33	162 Turf Merchants	51
128 KLM Bio-Systems, Inc.	28	214 Turf Seed, Inc.	5
129 Lebanon Chemical Corp.	18	160 Turfco Manufacturing, Inc.	72
166 Lebanon Chemical Corp.	26	163 Walker Manufacturing Co.	22
130 Lesco, Inc.	61	164 Well Cargo, Inc.	98
131 Lofts Seeds, Inc. ...	CV4		
133 Maruyama Mfg. Co., Inc.	89		
132 Mazda Motors of America	63		
134 Miller Electric Mfg., Inc.	97		

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PROBLEM MANAGEMENT

by Balakrishna Rao, Ph.D.

Where to find deficient elements

Problem: What is the best source of minor (trace) elements for one-shot spray programs? (Florida)

Solution: It is not clear whether you are dealing with turfgrass and/or ornamental plants. Whatever the crop, we need to know what minor elements are deficient. A soil and/or foliar analysis will help determine this. With this information it's easy to make nutrient recommendations.

Your idea of a "one-shot" spray program sounds interesting. However, the "one-shot" treatment may not work well in many situations since the treatment will not have enough specific deficient elements. Although a few products on the market contain several minor elements, I am not familiar with any one product that will be practical to use in your "one-shot" spray program.

With additional background information about crops and nutrient history, a further recommendation can be made. Therefore, first determine the deficient minor element (if any) and then follow the recommendations for correcting it.

Brown patches in centipede sod

Problem: What should you do first about brown patches in centipede sod? We put in new sod last summer and the spots are coming back in the same area. (South Carolina)

Solution: The brown spots may be related to abiotic disorders or to how well the sod was transplanted and watered during establishment.

Proper transplanting involves staggering the sod pieces in a checkerboard pattern on a well prepared soil bed. The ends of each sod piece should be joined without overlapping. It is important not to stretch the sod during transplanting since it can shrink when drying takes place.

After placing the sod, the area should be tamped or rolled to remove any air pockets, which can result in drying of plant parts, contribute to "brown or dead spots" and can cause a delay in sod rooting.

The fact that the spots occurred in the same location as before could indicate the presence of local dry spots in the soil. Test to determine if the brown areas absorb and retain moisture properly. If not, wetting agents and/or aerification may alleviate the problem.

Also consider the possibility of some diseases such as anthracnose and/or fusarium blight. If there is evidence of disease activity, provide for their management.

After the sod has been installed properly, it should be watered and kept moist until it establishes very well. Generally, deep irrigation to a 6- to 8-inch soil depth needs to be accomplished soon after the sodding is completed. Ideally, a low rate over an extended period of time should be good.

After this, the sodded area should be irrigated lightly every day to maintain sufficient moisture levels in the sod.

Now that the reasons for brown spots in sodded

areas have been explained, you should be able to minimize or treat for this type of problem. For existing problems, keep the area well-watered and provide good turfgrass management. Often stressed and weakened plants are susceptible to insect and disease problems. Therefore, provide pest management as needed.

Nitrogen rates for bluegrass

Problem: Is 1½ pounds of nitrogen per 1,000 sq. ft. per application excessive on bluegrass turf for a spring treatment on sandy soils? (Michigan)

Solution: Yes, particularly if you're using a quick-release source. However, 1½ pounds of nitrogen from a controlled-release fertilizer may not be excessive, depending on the solubility or release characteristics of the fertilizer.

Richard Rathjens, senior agronomist at Davey, says, "Regardless of soil type, a rate of 1.5 lbs. applied in the spring is a high rate, particularly if a quick-release source is used. Applications made at that time promote leaf growth at the expense of root growth and deplete carbohydrate reserves."

Because of the potential for nitrogen leaching and groundwater contamination, the standard recommendation for sandy soils would be to use controlled-release fertilizers or applications at low rates of quick-release fertilizers.

The emphasis should be placed on fertilizing in the fall or late fall to promote root growth, carbohydrate reserves and quick green-up in the spring.

Readers respond with solutions

In the August 1989 issue of LANDSCAPE MANAGEMENT, we answered the following question: "I recently heard that there is a serious blight on hemlock in the Connecticut area brought about by Hurricane Gloria. Is this possible?"

Concerning this question, one reader responded from Columbus, Ohio, and two from the Long Island area. Everyone suggested the possibility that the questionable "hemlock blight" is the spread of the woolly adelgid. I thank all of them for taking time to respond to the question.

LM



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

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

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