

AN HBJ PUBLICATION

\$2.50 / AUGUST 1987

# LANDSCAPE MANAGEMENT

Formerly WEEDS TREES & TURF

## CORES

'Cultivating' healthy turf

Golf Course  
Fertilization  
Guide



# Penneagle crowds out bluegrasses on Butler National's fairways



## Triplex fairway mowing at The Butler National Golf Club, Oak Brook, IL

When Oscar Miles, CGCS, of The Butler National Golf Club, introduced Penneagle creeping bentgrass into his *Poa annua* infested A-20 bluegrass fairways in 1980, he took a dynamic step toward the beautiful fairways praised by the pros during the Western Open.

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# LANDSCAPE MANAGEMENT

Formerly WEEDS TREES & TURF



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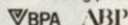
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## Insurance costs are growing

■ Rising liability insurance costs and legal battles are facing the green industry through the rest of the decade. Costs for insurance and legal defense fees constitute two major expenditures already in a number of golf course and company budgets.

John Moulder of Moulder Bros., Glendale, Calif., says his company spends about \$300,000 annually on insurance. He estimates that the fees have risen 450 percent in the last few years. However, he says, his legal fees are even larger.

Moulder Bros. currently faces about 15 lawsuits, either active or threatened. One involves a Naval employee who allegedly had an allergic reaction to a herbicide being sprayed by the company on a Naval installation. The suit is for between \$130,000 and \$140,000.

Golf clubs are also getting caught in the liability trap. Debates have surfaced over when clubs and courses are liable for injuries and damage resulting from wayward golf balls.

Courses built out in the boondocks 10 years ago now are in the middle of large residential areas. California (again) has led the way in the liability game. The "here first" argument does not hold up in court there (Sierra Screw Products v. Azusa Greens, Inc. 1979), the courts contending that courses are liable for damage and injury on adjacent property even though the property was developed after the course was in place and operating.

In addition, court cases have found clubs liable for spectator injury during tournaments. Perhaps clubs and tournaments should adopt a policy similar to that in place at many major league baseball parks such as Cleveland, which flashes a disclaimer on the scoreboard before each game releasing the team and organization from liability. Basically, it says by coming to the event the spectator assumes responsibility for an injury.

Clubs can successfully defend against liability cases if they can prove that "reasonable care" was taken in protecting residents adjacent to the course through design.

## Registration fees causing stink

■ Pesticide manufacturers are raising their voices against an EPA proposal to add a registration fee above and beyond the normal fee required to prepare papers under FIFRA.

Fees would vary based on the type of application a company makes to EPA, ranging from \$163,000 for new chemicals to \$600 for amendments to registered ones. The fees could put many small business in critical condition, or worse.

### LM Editorial Staff



Jerry Roche



Heidi Aungst



Jeff Sobul

### STAFF

Editor  
**Jerry Roche**, Cleveland  
Managing Editor  
**Heidi Aungst**, Cleveland  
Assistant Editor  
**Jeff Sobul**, Cleveland  
Publisher  
**Dick Gore**, Atlanta  
National Sales Manager  
**Jon Miducki**, Cleveland  
Senior Vice President  
**Tom Greney**, Chicago  
Group Vice President  
**Robert Earley**, Cleveland  
Production Manager  
**Carol Young**, Duluth  
Production Supervisor  
**Marilyn MacDonald**, Duluth  
Graphic Design  
**Deb Georges**, Duluth  
Graphic Coordinator  
**David Komitau**, Cleveland  
Circulation Supervisor  
**Gail Mantay**, Duluth  
Directory Coordinator  
**Linda Hietala**, Duluth  
Reader Service Manager  
**Gail Kessler**, Duluth  
Promotion Director  
**Linda Winick**, Cleveland

### OFFICES

**ATLANTA**  
455 East Paces  
Ferry Road Suite 324  
Atlanta, GA 30305  
(404) 233-1817

**CLEVELAND**  
7500 Old Oak Boulevard  
Cleveland, OH 44130  
Editorial: (216) 243-8100

**CHICAGO**  
111 East Wacker Drive  
Chicago, IL 60601  
(312) 938-2344

**SEATTLE**  
1333 N.W. Norcross  
Seattle, WA 98177  
(206) 363-2864

**DULUTH**  
120 West Second Street  
Duluth, MN 55802  
(218) 723-9200

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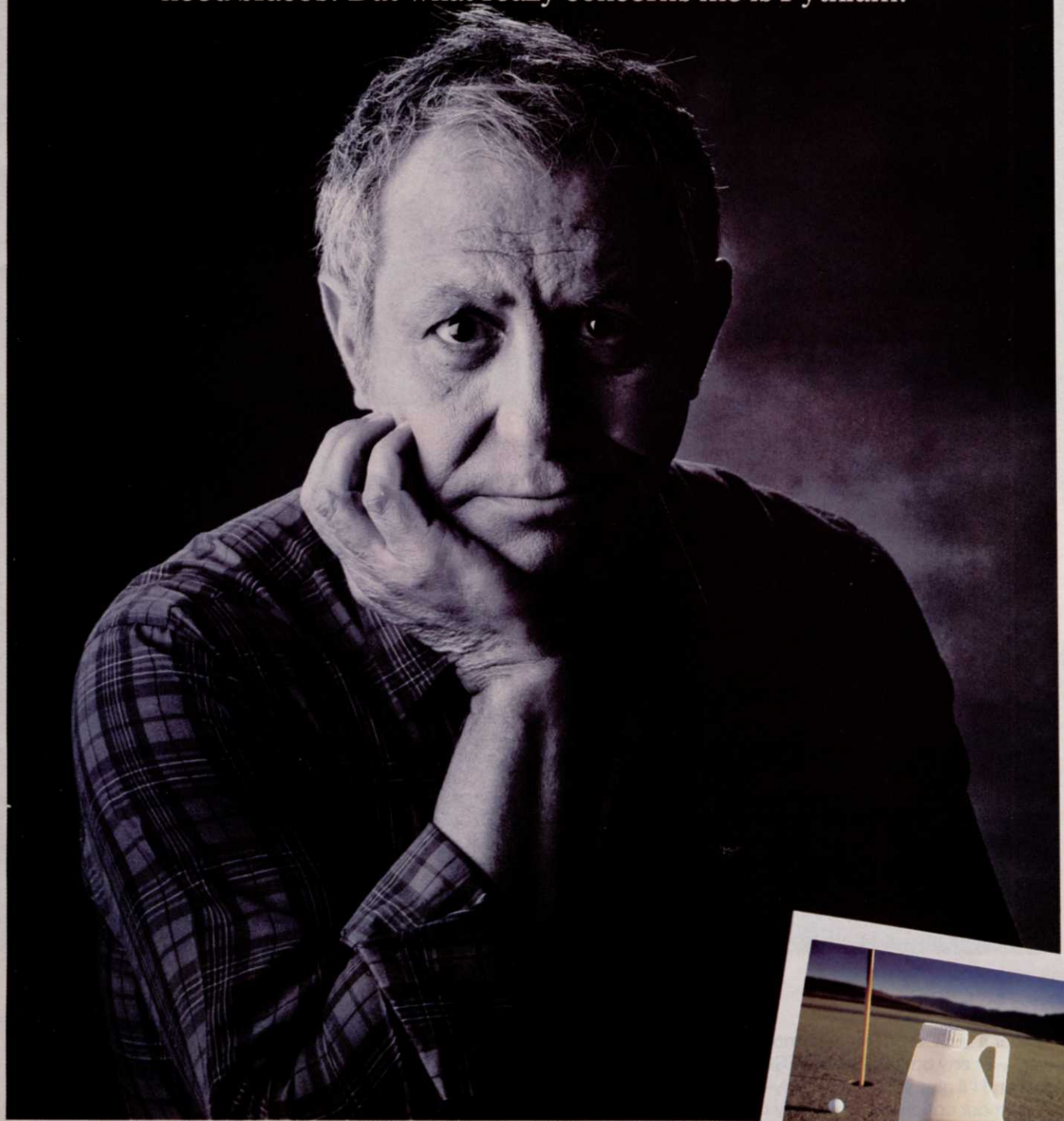
**Dick Gore**  
Atlanta (404) 233-1817  
**Jon Miducki**  
Cleveland (216) 243-8100  
**Marsha Dover**  
Cleveland (216) 243-8100  
**Ken Kuhajda**  
Cleveland (216) 243-8100  
**Robert Mierow**  
Seattle (206) 363-2864

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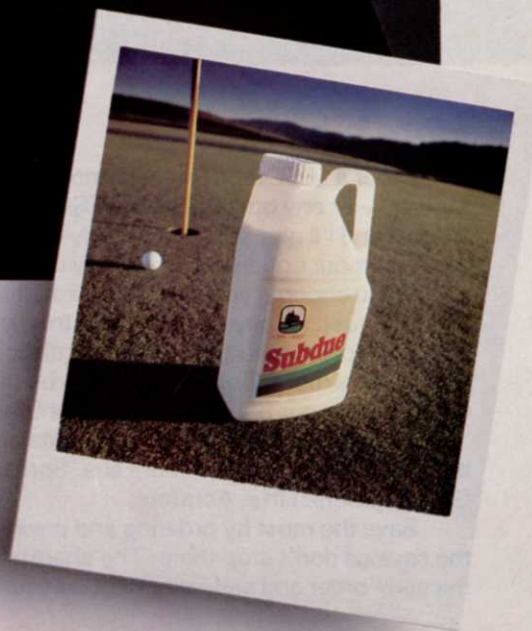
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<i>Month</i>	<i>Early Order Discount</i>	<i>Early Payment Discount</i>	<i>Sebring Pickup Allowance</i>
<i>August</i>	12%	7%	5%
<i>September</i>	10%	6%	5%
<i>October</i>	8%	5%	5%
<i>November</i>	6%	4%	5%
<i>December</i>	4%	3%	5%
<i>January</i>	2%	2%	5%
<i>February</i>	1%	1%	5%

*The LESCO Equipment Early-Order Program ends February 29, 1988.*





James I. FitzGibbon  
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# GREEN INDUSTRY NEWS

## LANDSCAPE MANAGEMENT

### Average industry salary: \$29,000 per year

The average landscape manager who reads this magazine supervises 16 employees and has been in the green industry for 14 years. According to original research conducted by Readex, Inc. for LANDSCAPE MANAGEMENT, the average landscape manager also makes about \$29,000 per year.

The survey, conducted last winter, determined that 46.9 percent of the random sample of LM readers have a college degree and that 70.2 percent have attended college.

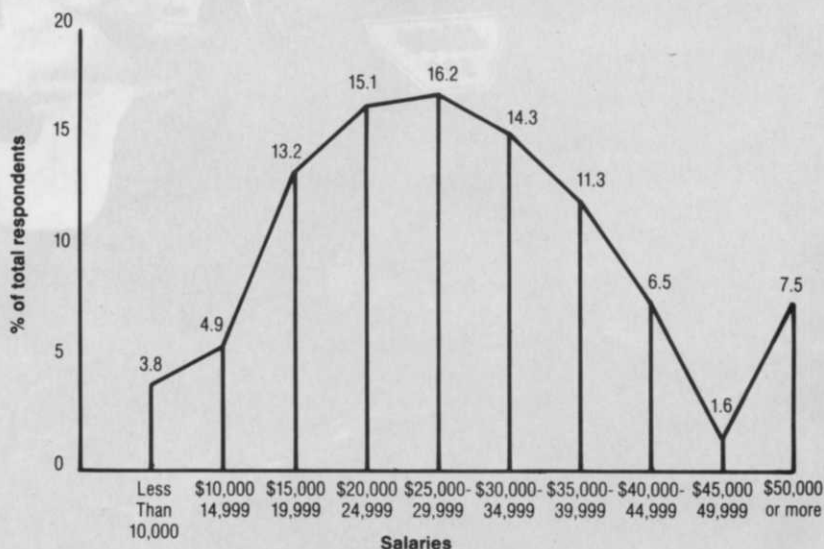
Other averages from the survey:

- acres of turf maintained: 157
- miles of rights-of-way maintained: 71.5 miles;
- lake acres maintained: 25.3; and
- number of years in present position: 10.

Respondents supervising more than 50 employees was 5.7% of the sample. Those supervising 20-49 people was 11.6%; 10-19 was 25.1 percent; 5-9 was 25.1 percent and 1-4 was 20.2 percent.

The results were based on a sample size of 371 out of 500 questionnaires mailed, a response rate of 74 percent.

### LANDSCAPE MANAGERS' ANNUAL SALARIES



## INDUSTRY

### Barefoot strikes agreement with Scott's parent company

CDS Holding Co., a division of Clayton & Dubilier, New York, N.Y., has acquired controlling interest in Worthington, Ohio-based Barefoot Grass Lawn Service, Inc., for an undisclosed amount. The company also owns O.M. Scott & Sons.

"The management of CDS Holding was interested in increasing their participation in the lawn care business," says Kimberly J. Rendleman, a spokesperson for CDS. She adds that Barefoot Grass is recognized nationally as a leader in the lawn care industry.

Barefoot Grass is the fourth largest lawn care company in the country, with 43 branch and franchise outlets. Revenue for 1986 was \$17.2 million for the branches, \$4.8 million for the franchises.

"They (Dubilier) brought more to the table than money," says Barefoot Grass president Patrick Norton. "I'm very enthusiastic."

Norton feels the action will bring about little change in the company's present operations. He says one stipulation of Clayton Dubilier's buyouts is that management usually stays and continues to have a stake in the operation. CDS Holding's Rendleman confirms this, adding that no management changes are planned.



Norton

"O.M. Scott has the best name in do-it-yourself lawn care," Norton says. "There are some interesting though yet undefined opportunities as far as that goes."

"They'll open some doors for us as far as the ability to fund growth," he adds.

## ASSOCIATIONS

### N.A.A. to open its membership ranks

The National Arborist Association has opened its doors to any commercial tree service.

In the past, the N.A.A. had required prospective members to be recommended by a member firm. That requirement has been dropped.

"We are increasing our staff from six to seven people," says executive director Bob Felix. "We would like to increase our membership from our current 600 to include many of the other 13,000 tree services which make up our industry."

"We would also like to upgrade those who aren't members through communication and education. We need better trained tree workers, crew leaders and owner knowledge about the tree care business," Felix notes.

With a larger member base, Felix feels the N.A.A. can better serve the industry.

For more information, contact Patricia Felix, N.A.A., 174 Route 101, Bedford, NH 03102. Phone number there is (603) 472-2255.





### New faces at LM

Jon Miducki (above left) has been named national sales manager for LANDSCAPE MANAGEMENT magazine, according to publisher Dick Gore. Miducki had been regional sales manager. Added to the sales staff of the magazine as regional sales managers are Marsha Dover (center), who will be serving portions of the Midwest, and former managing editor Ken Kuhajda (right), whose territory will cover the upper Eastern seaboard and New England. Bob Mierow will continue to service the West Coast.

### CONVENTIONS

## Staubach keynotes annual PLCAA show

Hall of Fame quarterback Roger Staubach, the winningest quarterback in National Football League history, will present the keynote address for the eighth annual Professional Lawn Care Association of America's Conference and Show in San Antonio, November 12-15.

Staubach played 11 seasons in the NFL after getting a late start on his professional career because of his four-year military obligation following graduation from the Naval Academy.

He was the Cowboys' starting quarterback for 8½ seasons, leading them to victories in Super Bowls VI and XII. Staubach won many honors in his college and pro career, including the Heisman Trophy as the top collegiate player in 1963, and the Bert Bell Award in 1971 as the top player in the NFL.

### READERS RESPOND

## How would a change in the minimum wage affect you?

A bill introduced by Sen. Edward Kennedy (D-Mass.) would eventually raise the minimum wage to \$5 per hour. If passed, the bill could have an effect on the green industry.



"I am of the opinion that the minimum wage is controlled by supply and demand. Because of the short supply of labor, businesses are already paying that much to get people in the door. So, in this area it won't have much effect."

—Susan B. Haupt  
The Haupt Tree Co.  
Suffolk, Mass.



"The impact I think it's going to have on our business is in several things. Operations will become more automated, relying more on chemicals. I don't think any of the impact will be good. It will raise everybody's costs across the board. Fifty percent of everything we buy is labor-related.

"Anybody naive enough to believe that it's not going to have an effect because they pay more than the minimum wage now is crazy."

—Dave Pinkus  
North Haven Gardens  
Dallas, Tex.



"We pay pretty much that anyway. They make close to that starting out, and if they can do the job then we raise them up. I'm looking to pay bigger bucks than \$5 to hold these guys if they're good."

—Bob Berry  
Lancaster Landscape  
Arlington, Va.



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## CHEMICALS

### Elanco announces name of herbicide

Elanco Products Company has formally named its broadleaf pre-emergence herbicide EL107 "Encore."

The non-phenoxy herbicide, chemical name isoxaben, is registered to work on over 40 broadleaf weeds, though it doesn't control perennial dandelions. According to Elanco communications manager Roger Foulks, it does suppress seedling dandelions with about 80 percent efficiency. It has no post-emergence activity.

Development of the herbicide began about nine years ago, Foulks says. It was first introduced in England in 1981 for pre-emergence control of winter annuals in wheat and barley fields. Application rates were about 10 to 20 grams per acre, though Foulks says rates would be higher for turf.

ChemLawn has been conducting trials with the herbicide in the U.S. The herbicide is intended for use in the spring to control summer annuals, and in the fall to control winter annuals. Foulks says Elanco expects EPA registration in time for use in Fall, 1988.

## PEOPLE

### Retirement for industry leaders

Two distinguished members of the green industry will retire after more than 25 years of service to the industry.

Bob Lederer is retiring this month after 29 years with the American Association of Nurserymen, the last 23 serving as executive vice president.

He is noted for working with a



Nancy Reagan and Bob Lederer

number of First Ladies on various programs, beginning with Lady Bird Johnson in her National Beautifica-  
*continued on page 14*



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The new John Deere AMT™ 600 “All Materials Transport” treads so lightly, it’ll barely bend your bent grass.

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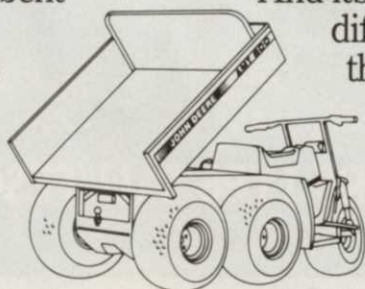
board, the AMT only puts down an average of 17 psi of ground pressure.

And its automotive-type differential allows the inside wheels to

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*The 48¼ x 43-in. box manually raises to a 45 degree angle.*





# OUT LANDSCUFFING

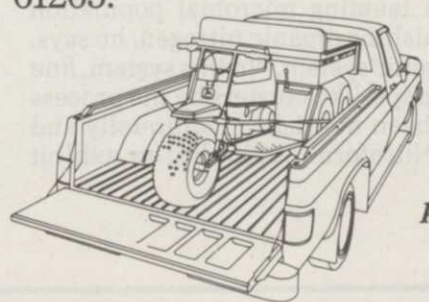
powerful 8.5-hp drive system provides a 62-to-1 torque ratio for tremendous pulling power.

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**STATE OF THE UNION...**Union membership will be mandatory if a new bill gets through Congress. H.R. 281, known as the anti-double breasting bill, calls for compulsory union membership for construction workers, including landscape firms and contractors. Such a law could escalate labor costs, reducing the ability of some firms to compete for landscape bids. The American Association of Nurserymen is asking landscape managers to oppose the bill. Write your representative at U.S. House of Representatives, Washington, D.C. 20515; (202) 224-3121.

**HOLE-HEARTED RESEARCH...**Preliminary athletic turf studies at the University of California at Riverside by Matt Leonard, Ph.D., with polyethylene covers determine that the hole size in the covers has some effect on turfgrass ground temperatures. Leonard evaluated hole sizes of 1/4, 1/2, and 3/4 inches on five-inch centers and concluded that the smaller hole size seemed best because more heat could be retained longer.

**GETTING IT STRAIGHT...**Turf Seed sells wildflower mixes, not Tee-2-Green, as we reported in the May issue of LANDSCAPE MANAGEMENT. In addition, we reported in the April issue that since Jacklin Seed Co. was increasing its bentgrass growing acreage by 35 percent, supplies of Pennlinks, Penncross and Seaside bentgrasses would be good. However, Gayle Jacklin points out that high demand may keep supplies limited.

**HOUSEHOLD CHORES...**How many pesticides is the average person exposed to during the day? The EPA wants to know. A study is looking at homes in Springfield, Mass., and Jacksonville, Fla. About 50 participants will carry personal air monitors to determine their exposure to about 30 different household pesticides during routine daily activities. Identical monitors will be placed in the homes and yards of the participants. Several participants will be asked to perform pesticide applications. The results are due in late 1988.

**PALM TREES IN NEW YORK?...**In the "On Design" feature in June (page 63) pictures at the bottom of the page were reversed. The Oyster Bay, N.Y. residence by Alley Pond Nurseries Huntington, Inc. of Dix Hills, N.Y. is set in a wooded area containing redbuds, weeping hemlock and birch. The Ft. Lauderdale, Fla., project designed by Roland Lieber of Naples, Fla. and installed by Friends Landscape of Ft. Lauderdale, contains tropical Alexander palms and bougainvillea. We apologize for the mix-up.

**DEALING WITH DROUGHT...**According to Fred V. Grau, Ph.D., of the Musser Foundation and National Sports Turf Council, soil fortified with a teeming microbial population delays drought effects. By furnishing organic nitrogen, he says, the turf is maintained in an organic system. "In this system, fine soil particles are formed into grape-like clusters by the process of flocculation. Turf that has been nourished continually and consistently with ureaform (Nitroform) is the last to exhibit drought effects."

tion Program during the 1960s. He has worked with Patricia Nixon, Rosalyn Carter and Nancy Reagan on AAN's National Landscape Awards Program.

He also serves as the vice president on the board of the National Wildflower Research Center.



Ablon

Leonard Ablon, vice president of sales for Western Landscape Construction, a subsidiary of Environmental Industries, Inc., Calabasas, Calif., will retire after 25 years with Environmental. He will continue with EII in an advisory role.

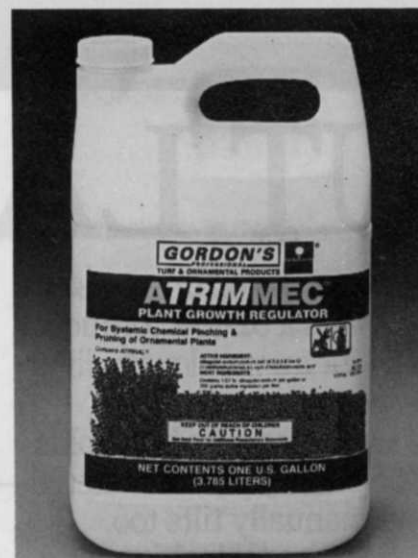
Ablon joined EII subsidiary Valley Crest Landscaping in June, 1962, and was instrumental in the growth of the company over the following years. In 1965 he became president of V.C. Irrigation, a company established to handle irrigation installation for Valley Crest Landscape and other contractors. He remained president until 1969, when V.C. Irrigation merged with Valley Crest Landscaping.

## PRODUCTS

### Growth regulator can reduce pruning

A new plant growth regulator registered for use on shrubs, hedges and trees has been released by PBI-Gordon.

According to the company, Atrim-



mec Plant Growth Regulator will cut pruning and labor costs by 50 percent or more.

The active ingredient in Atrimmec, atrinal, interrupts apical domi-

*continued on page 16*



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# Dollar spotless.

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nance, halting growth at the vegetation point. This marks the first time an atrinal formulation has been available for plant growth regulation in the United States.

The company maintains that the product will inhibit upward growth while encouraging lateral branching, allowing the plants to fill in. The chemical is applied as a foliar spray after ornamentals are trimmed. The active ingredient is translocated from the leaves to the growing tips. For larger trees, Atrimmec is applied by injection. The product has no effect on

grassy plants.

Atrimmec causes only minute discoloration of leaf blade edges, notes PBI-Gordon's Hal Dickey. Because of this, he adds, "we don't think that people will go to the time and expense to mask it."

According to the company, one gallon of finished spray solution, containing 1 to 3 oz. of Atrimmec, will cover 400 to 600 sq. ft. of hedges, groundcovers or other vegetation. Atrimmec sells for about \$208 per gallon.

PBI-Gordon has also introduced Ornamec Grass Herbicide, a post-

emergent for control of annual and perennial grasses in ornamentals. Labeled for use on nearly 500 ornamentals, it is the result of an agreement with ICI-Americas, Inc., to formulate, package, market and sell fluzafop-P-butyl (Fusilade) herbicide in the United States under the PBI-Gordon trade name and logo. Fusilade has previously been used in crop agriculture.

Ornamec can be applied over the top on most of the ornamentals on its label, according to PBI-Gordon director of research Jan van Diepen, Ph.D. He notes that 30 grass weed species appear on Ornamec's label, with several more to be added in the future.

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### INDUSTRY

## Nor-Am gets U.S. rights to fungicide

Nor-Am Chemical Co. has reached an agreement with Nihon Nohyaku Co. of Tokyo, to give Nor-Am sole U.S. licensing rights to a new fungicide compound.

The fungicide, flutolanil, is already in use in some areas of Asia, where it has been used primarily on rice fields.

According to George E. Jones of Nor-Am, the company will conduct field trials over the next two to three years to accumulate data for submission to EPA for approval to market the product, directed at agriculture, turf and ornamentals.

He expects it to be at least three or four years before the product, which is as yet unnamed, will be released to the market.

### DISEASES

## Multiple diseases the bane of courses

Golf course superintendents are having an exceptionally hard time coping with diseases of turfgrass this summer, according to Houston Couch, Ph.D., of Virginia Polytechnic Institute and State University.

"I've gotten calls from Ohio, North and South Carolina, Colorado, Nebraska, Texas, California and elsewhere this year," says Couch. "People are controlling one disease but something else comes in. I know for a fact that there are people losing jobs over this problem."

Couch suggests that golf course superintendents not "lock in" on one disease, but be on the look-out for multiple pathogens.

"This is proving to be the year of the pathologist," he claims.



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112	126	140	154	168	182	196	210	224	238	252	266	280	294	308	322	336
113	127	141	155	169	183	197	211	225	239	253	267	281	295	309	323	337
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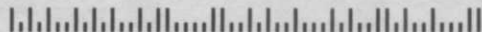
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Circle No. 106 on Reader Inquiry Card



# BRINGING BACK THE GRASS

Damaged grass can be rejuvenated in any number of ways. Renovation through aerification and overseeding might cure your damaged turf.

by Jim Mello



Drum-type aerators use the weight of a heavy tractor for good penetration. They will aerate a large area quickly.

**I**n turfgrass management, the answers aren't always easy. Turfgrass managers may turn to the spray gun or spreader, but still not solve the problem.

Fertilizers, fungicides, insecticides and herbicides handle many problems, but they won't bring dead plants back to life. Renovation, through aeration, may be necessary.

The first step is to identify the problem. Ask yourself these questions:

Is the problem due to poor grass selection?

Is it due to improper cultural practices?

Is it due to insects, disease, thatch or compaction?

The next step is to weigh the alternatives. Should existing turf be killed? Will aerification and overseeding do the job? Should a slit-seeder be used?

## Identify the problem

Improper variety selection can be the

Jim Mello is president of Nice 'N Green, Romeoville, Ill.

basis for turfgrass decline. Fine fescue, basically a shade-tolerant grass, will do well in the full sun of a cool climate, such as western Canada. However, when fine fescue is grown in the sun under warm temperatures, like southern California, it has difficulty surviving.

Warm-season grasses such as Bermuda or zoysia do well in the southern U.S., but they lose color north of the transition zone.

In New England, many old lawns have been seeded with common Kentucky bluegrass varieties. In the cool, moist climate, leaf spot disease flourishes, thinning out many turf areas. These areas should be renovated to improved bluegrass varieties, resistant to leaf spot.

## Cultural practices

Improper cultural practices set the stage for many problems. Any procedure performed on turf which causes stress invites unwanted pests to attack the predisposed turf.

Close mowing, improper irrigation, poor fertilization practices, chemical injury, heavy wear, soil

compaction, excessive thatch accumulation, extreme air temperatures and drainage problems are some of the stresses which weaken turf and encourage problems that have to be remedied through renovation.

A healthy lawn or fairway which contains a high percentage of broadleaf weeds or annual grasses can be corrected through the proper selection and application of herbicides. Applying a broadleaf herbicide or pre-emergence annual grass control can maintain that area weed-free.

Certainly this situation would not call for renovation unless the desirable grass species remaining are not maintaining a dense cover. In this case, the introduction of seed would provide new plants.

## Other factors

Insect damage can seriously thin turf. Insects should be identified to learn what type of insects (sucking or chewing) and which plant parts are affected. For example, the greenbug aphid will attack the leaves of Kentucky bluegrass, piercing cells and sucking out the leaf juices.



In many cases, the application of an insecticide in combination with nitrogen will stop further damage and promote new top growth. Seeding would not be necessary.

Damage to roots and crowns by white grubs, billbugs and ateniids will cause complete loss of turf areas. After an insecticide is applied to stop further damage, renovation is necessary to regain a healthy grass stand.

Be aware that not all damage by insects requires renovation. Give the turf a chance to recover and then renovate bare areas.

Diseases cause various symptoms in turf, ranging from slight discoloration to death. Whether total kill has come from fusarium blight in bluegrass, anthracnose in annual bluegrass or spring deadspot in Bermudagrass, the only solution to dead turf is replanting.

Fungicides are a great preventative tool, and the high cost can be justified when putting green quality maintenance is involved. But when we main-

tain large areas, such as home lawns or parks, the cost of fungicide use becomes prohibitive.

When cultural procedures, such as proper mowing and watering, cannot keep a turf area from fungal infection, rejuvenation through renovation becomes the most economical alternative. Proper diagnosis of the disease aids in selecting the proper varieties for the reclamation process.

A weed is simply an out-of-place plant. In Tulsa, Okla., annual bluegrass is a weed in a Bermudagrass lawn, but in Cincinnati, Ohio, Bermudagrass is a weed in an annual bluegrass fairway. Weedy grasses, such as quackgrass, annual bluegrass or nimblewill are objectionable because of their variations in color, growth habits and competitiveness. Once a perennial grass species invades, a non-selective herbicide must be used to kill the unwanted vegetation.

### Renovation alternatives

Before starting to restore problem

turf, examine alternative programs. If a golf course fairway needs renovating, would the program interrupt play?

If renovating a large area for a public park, how tight is the budget? Can the homeowner justify the expense involved in alternative renovation programs for their troubled landscapes?

### Dethatching and overseeding

Many turf areas are being reclaimed through dethatching or power raking and overseeding. A dethatcher or power rake has a set of blades of spring teeth, which cut or comb the thatch, bringing it to the surface. To prepare a seedbed effectively, the seed must come in contact with the soil. Dethatchers will bring a great deal of debris to the surface, but if there is a severe thatch layer, the blade will not penetrate completely down into the soil.

Dethatching should be repeated, removing as much of the thatch layer  
*continued on page 24*

## Slitseeding to the rescue

Sometimes turf is so severely thinned that core aeration and overseeding will not provide enough plants to recover the declining area. In this case, the slitseeder can be used to incorporate seed in rows without completely stripping the area and starting all over.

The grass should be mowed short to reduce the debris brought to the surface. The slitseeder will bring matted grass and heavy thatch to the surface.

After the renovation is completed, this material should be raked or scraped up.

Whenever seeding is done, proper placement of the seed in contact with the soil should be given the utmost priority. If moisture, light and temperature favor germination, a seed may germinate in the thatch but its survival potential in this porous medium is low.

By using the slitseeder, seed-to-soil contact is assured. The machine has a set of blades in front which cuts grooves through the thatch down into the soil.

A set of disks located behind the blades keeps the slits open while seeds flow from a seed hopper through a small tube into the slits at the base of the disk.

The slits are two to three inches apart, close enough for the new plants to fill in rapidly. The slit-

seeder also cuts through the thatch layer, providing an avenue for the new seedling to grow through. This vertical cutting action also stimulates new growth.

Rhizomes and stolons of the existing turf are cut and new shoots grow from uncovered nodes and growing points.

New seed varieties can be incorporated without severe surface disruption. Slitseeding followed by core aeration provides excellent results because the surface has been mechanically modified to favor new growth and development. The seeding rate would vary depending on the various weights of the different species. The rate of seed flow is easily adjusted to compensate for seed size and weight.

An advantage is that the area renovated by slitseeding is never out of service. The area will look as if it has been renovated but it will still be firm and usable. In fact, entire fairways on golf courses have been changed from one variety to another without any interruption of play.

One disadvantage of slitseeding is the impatience of some people eager to have a beautiful turf area. A beautiful turf from seed or slitseeding takes longer than laying sod.

Your potential slitseeding customer must be informed that it will

take the seed months to fill in and form a dense turf. The homeowner also should know they may have to look at weeds during the recovery period when herbicides can't be applied.

Another challenge to slitseeding is irrigation systems. You have to make sure they are not damaged. Marking all the sprinkler heads and valves with marking paint or short stakes makes visibility simple.

### Timing

Timing of the slitseeding process is critical for proper establishment. Slitseeding cool-season grasses does not do as well in the spring as it does in the fall. Cool soil temperatures in the spring prolong the germination time and the existing sod grows vigorously during the cool, moist season.

The soil beneath the sod warms much more slowly than the bare soil which readily absorbs the sun's heat and light. The competition from the established grass reduces the chance for the new seeds to develop.

Pre-emergence herbicides to control spring and summer annuals cannot be applied because they will inhibit the growth of the new seedlings. The physical opening of the turf provides an opportunity for  
*continued on page 24*



## RENOVATION *from page 23*

at one time, without tearing out the entire sod layer. When a heavy thatch condition develops, crowns and other parts of the plant grow in the porous, organic layer, creating problems. The thatch, because of its physical nature, does not provide a satisfactory growth medium.

To dethatch an area totally, (removing all the dead organic matter), could leave the area with hardly any plant growth left.

By repeating the dethatching procedure many times, removing a portion of the layer each time, allowing time for recuperation between each dethatching, eventually the desired thickness of the organic layer will be reached.

This program involves many hours of labor for both machine operation and cleanup time. If the thatch layer is thick the seed will lay on top of the thatch and its potential for establishing itself is not great.

If the thatch layer is not thick, then

the dethatching units can cut through and expose the soil for seeding. In this case, dethatching the area once to break up the layer and removing the debris is all that is necessary. Seed should then be broadcast over the entire area, and the dethatching process should be performed again to incorporate the seeds in the soil. One of the greatest benefits of the dethatching units even when they can not fully penetrate the thatch area is their vertical mowing action.

Once the thatch depth is under control, routine dethatching will keep the layer to minimum reducing plant stress. Dethatching, however, does not have any effect on relieving soil compaction in established turf. This can only be accomplished through aeration. Dethatching should be scheduled for fall, reducing the incidence of annual grasses and broadleaf weeds.

If a pre-emergence crabgrass herbicide has been applied the cutting

action of the dethatcher will break this barrier and bring about a potential weed problem.

Dethatching is one form of renovation which should be used as a preventative measure rather than a cure for heavy thatch. To reduce a two-inch thatch layer properly to a quarter inch or to prepare a favorable seedbed requires numerous efforts.

### Core aeration

Interfacing soil problems, heavy thatch and poor rooting hinder the normal growth and development of a sodded area. Reduction of these stresses can be achieved through core aeration on a yearly or bi-yearly schedule. Core aeration involves the removal of a soil/thatch core two to three inches deep over the entire problem area. Coring breaks up the thatch layer, allows water to penetrate into the root system and gases to flow freely in and out of the root zone. Coring breaks up the serious interfacing

*continued on page 26*

## SLITSEEDING *continued from page 23*

weed seed to grow and develop.

Post-emergence herbicides should not be applied because of damage to the young seedlings. If you live in an area where summers are hot and dry, the young seedlings which germinate in late spring will not have developed their root systems.

Their survival through stress periods, therefore, depends on faithful watering to keep them alive. This could mean numerous waterings, perhaps even daily, if drought and high temperatures persist.

Slitseeding in the fall is best. Pre-emergence and post-emergence herbicides can be applied in the spring. In late summer when cool-season grasses are growing slower (which will reduce their competition with the new seedling) the high temperatures will promote rapid germination. The cool and moist fall period provides a favorable environment for the young seedling to survive.

Both pre- and post-emergence chemicals can be applied the following spring since the plant will have matured.

By the time the summer stress period approaches, the plant will have a developed root system, which requires less water and is prepared to face the heat and drought. An old diseased or insect-riddled turf area now takes on new



Slitseeding can help revive worn areas on athletic fields.

life as the improved varieties take over.

### Warm-season grasses

Warm-season grasses in the South are often overseeded during winter to provide a green turf full-season. The strong lateral growth of Bermuda grass, zoysia and St. Augustine grass, benefits greatly from annual vertical mowing. Using a slitseeder, the vertical mowing and

the overseeding can be done in one operation.

By using the slitseeder, different varieties can be used by simply adding the seed to the hopper. Shade areas can be seeded with shade-tolerant grasses, while heavy-wear areas can be seeded with wear-tolerant species. Selecting the right seed for environmental conditions assures success in establishment.

—Jim Mello



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## Spoons or tines?

It's a question that faces many landscape managers. Proper aeration is an important turf management practice, one with numerous benefits. Finding the right aerator for a particular job can be the key to proper aeration.

There are two basic types of coring devices: the open spoon tine and the closed, hollow tine. With aeration, says Paul Harder of Prescription Turf Services, Middleton, Mass., the primary concerns should be the number of cores per square foot and the depth.

From a turf management standpoint, he doesn't see much difference between the two types of tines. However, he does say the open tines are more useful when doing slicing or overseeding because they bring up more soil which acts as a top dressing.

The major difference seems to be cosmetic. The hollow tine makes a cleaner hole. "I favor the hollow tine because it does a neater job," Harder says. "When the job is done it looks clean."

Jerry Faulring of Hydro-Lawn in Gaithersburg, Md., echos this feeling. He has used both, and, he says they do a comparable job. Again the only difference is cosmetic.

"A spoon kicks out the core better," says Stan Zontek of the USGA Green Section in West Chester, PA.

Brian Bossard, field manager at San Diego's Jack Murphy Stadium, prefers spoons. "They keep clean better." He adds, though, that hollow tines make a cleaner hole. He uses half-inch hollow tines on the stadium field.

The depths of hollow and open don't seem to vary much either, notes Harder. Penetration depth is dependent of soil conditions at the time of aeration. If the ground is hard, neither type of tine will penetrate well.

A problem arises just below that aeration zone, though, Zontek says. At about four inches deep, researchers have found a layer of compaction caused by the aeration. A task for researchers in the future, Zontek says, will be to develop an aerator that can break up that layer.

He says slicers with blades much like Bowie knives, nine-inches long, are being experimented with in Europe.

And while the perfect aerator has yet to be developed, a number of researchers are taking a poke at it. Results should be coming out soon.

—Jeff Sobul

ing problem of soils with unlike physical properties.

The greater the porosity the more room for the roots to grow and develop. In a tightly compacted clay under-soil, roots have very little room to grow. The roots prefer to stay at the surface in the porous peat or loam soil brought in with the sod. Core aeration creates large pore spaces which rapidly fill in with turf roots. This greatly increases the turf's vigor, drought tolerance and overall health.

Large core aeration units are available for vast turf areas such as parks and fairways. On the home lawn, a smaller unit is needed to maneuver the equipment in tight places. The unit should also be capable of being raised or lowered for driving over sidewalks and curbs.

To properly core aerify, the unit must have the capability of penetrating deeply. The soil should be moist to provide the deepest penetration. Dry soil does not permit this and aerating wet soil can make quite a mess.

Heavy, fine-textured clay soils are more difficult to penetrate than sandy loam soils. Many core aeration units are on the market, but you must select the one which is capable of penetrating the particular soil to be aerated.

Drum-type aerators work fine as long as enough weight is provided.

### *Roots do not grow in soil; roots grow in spaces between soil particles.*

The punch-type aerators are not dependent on weight and usually offer the best aeration; however, it requires more maintenance to keep them operating.

With the sod fully opened, overseeding efforts will provide excellent results because the seeds will come into contact with the soil. The soil

cores brought to the surface are broken up by rains and provide a top dressing rich in soil microorganisms which biodegrade thatch into valuable plant nutrients.

The soil brought to the surface also makes a favorable seedbed into which new varieties can be incorporated. This process should not be called dethatching, but more appropriately thatch modification. The intermingling of the soil with the thatch favors decomposition and alters the physical structure of this organic layer. With soil core removal water can now penetrate the surface easily, fertilizer can move more readily to the root system and gases and heat exchange can take place. New varieties of turf can be incorporated for a move away from the less desirable monoculture and toward better disease resistance.

With warm-season grasses, the benefits also include a source of new plantings. Each soil core removed contains viable nodes which can give rise to new plants. These sprigs can be collected and used to establish grass in problem areas or in new places where vegetation is needed.

Golf course superintendents have established nurseries by collecting these plugs, piling them two to three inches deep, raking them level, rolling, fertilizing and watering. New growth begins immediately.

Core aeration done on a routine basis can help to restore many declining turf situations. Coring should be considered before reaching for a solution on the chemical shelf.

### **Shatter core aeration**

Shatter core aeration (solid tines) is relatively new. It involves the penetration of the thatch soil zone without the removal of a core. This can be used as an immediate remedy to a severe thatch layer or poorly drained tight soil to open up the surface and allow for infiltration of water, nutrients or pesticides.

It does not relieve compaction but it has a shattering effect which, depending on soil type, may stimulate growth. More research work needs to be done in this area and more reports from the field are needed to assess the benefits to turf from shatter core aeration.

At some point all turf professionals must deal with the challenge of declining turfgrass. By sharing ideas at seminars, field days and conventions, we can keep up with our growing and everchanging field and upgrade the professionalism in turfgrass management.

LM



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Test conducted by Clemson University.

Large Crabgrass	Dandelion	Yellow Nutsedge	Wild Garlic	Florida Pusley	Buckhorn Plantain
100%	26.5%	20%	0%	4.25%	31.25%
0.25%†	0%	0%	0%	0%	2.75%
Bare Soil	Weed Arrest	Bare Soil	Weed Arrest	Bare Soil	Weed Arrest
<b>PLANTING RATE</b>					
4 grams per 20 sq. ft.	11 grams per 20 sq. ft.	12 nutlets per sq. ft.	10 bulblets per sq. ft.	9.25 grams per 20 sq. ft.	6.40 grams per 20 sq. ft.

Percents refer to the percentage of area covered by weeds.

†0.25% means 1/4 of 1%

Pigweed	Bahiagrass	Sandbur	Johnsongrass	Purplevetch	Lambsquarter
50%	51.25%	15%	81.25%	53.75%	41.25%
0%	2%	0%	0%	0%	1.5%
Bare Soil	Weed Arrest	Bare Soil	Weed Arrest	Bare Soil	Weed Arrest
<b>PLANTING RATE</b>					
3.25 grams per 20 sq. ft.	6.90 grams per 20 sq. ft.	10 burs per sq. ft.	4.40 grams per 20 sq. ft.	15 seeds per sq. ft.	5.80 grams per 20 sq. ft.

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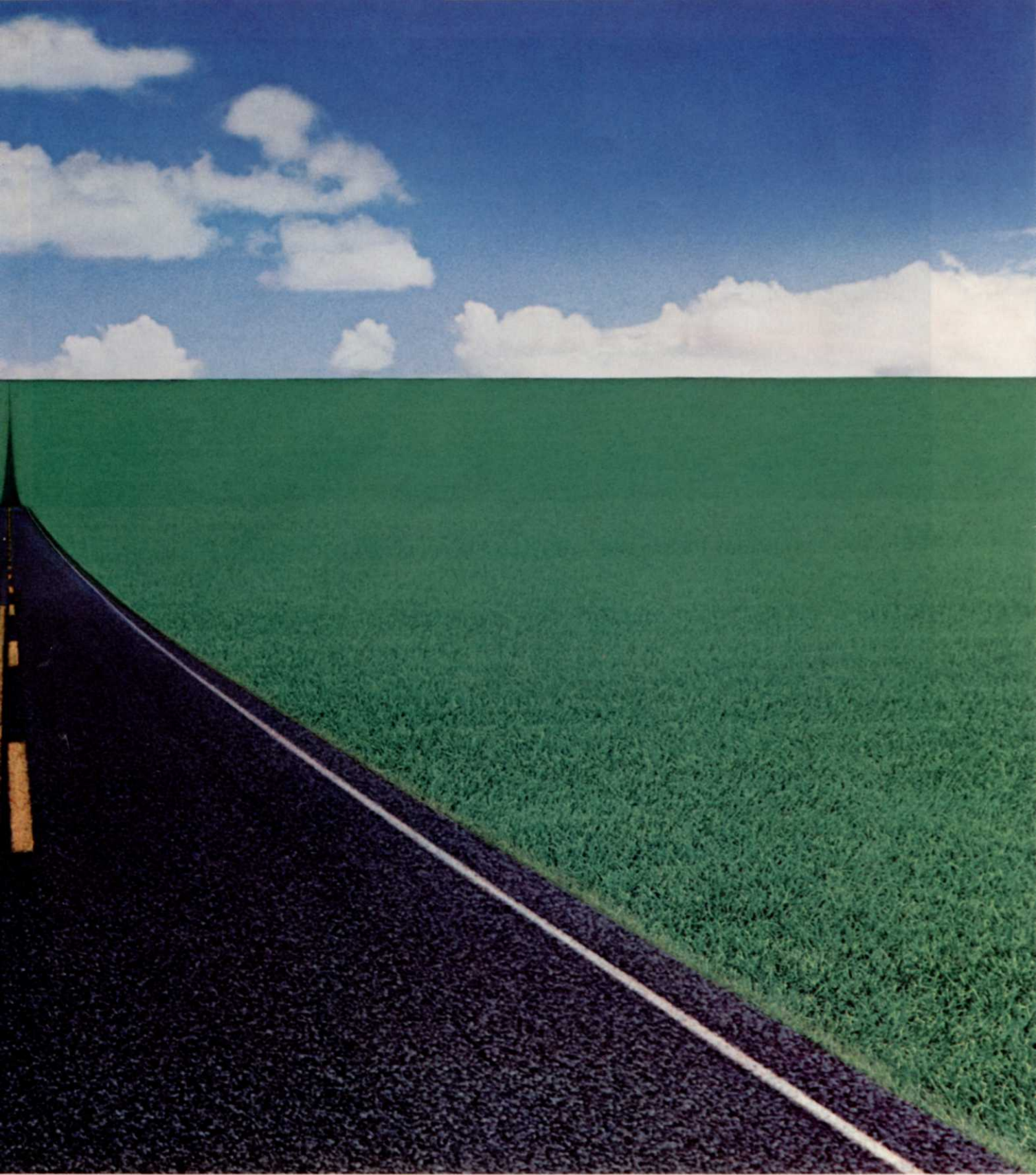
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Crews prepare the 12th green on the North course for reseeding. Every green on the North course was renovated.

## A CHALLENGING COURSE

Olympia Fields' two courses have presented more challenges for the superintendent than they have for the golfers.

by Jeff Sobul, assistant editor

**B**rian Chalifoux might as well have started from scratch. He practically did anyway.

When he took over as superintendent at Olympia Fields Country Club in the fall of 1983, he had no idea of the amount of work needed to renovate the club's two courses. But when the courses started showing signs of Toronto C-15 bentgrass decline, he started getting notions. Three years and two renovation programs later, the task continues.

### Major project

In those three years, Chalifoux and

his staff of 12 full-timers and 40 peak season employees have completed fairway renovations on both the North and South courses and complete tee and green renovation on the North course.

In the fall of 1984, fairways on the North course were about 50-50, bentgrass to poa annua. South course fairways were 65 or 70 percent bentgrass, Chalifoux says. North course greens weren't any better.

"We were in a situation on the greens where we had C-15 decline and we didn't have much choice in the matter. We had to go in and renovate," Chal-


ifoux says. "What weren't problems with C-15 were problems with predominantly poa annua greens which were getting very difficult to maintain."

All the greens were stripped, the soil loosened and fumigated, and then overseeded with Pennncross creeping bentgrass. Applications of starter fertilizer, hydromulching and irrigation followed.

The greens have come up nicely, but not without a few headaches. "On the negative side of doing these projects is that the membership is generally looking for something instant," he says.

*Continued on page 32*



A white plastic bottle of MAVRIK AQUAFLOW Insecticide is tucked into a brown leather holster. The holster is attached to a matching brown leather belt with a silver buckle. The background is a scenic view of a golf course with green grass, trees, and mountains under a clear sky. The text 'MAVRIK. ALL THE AMMUNITION YOU NEED.' is printed in large, bold, white letters on the right side of the image.

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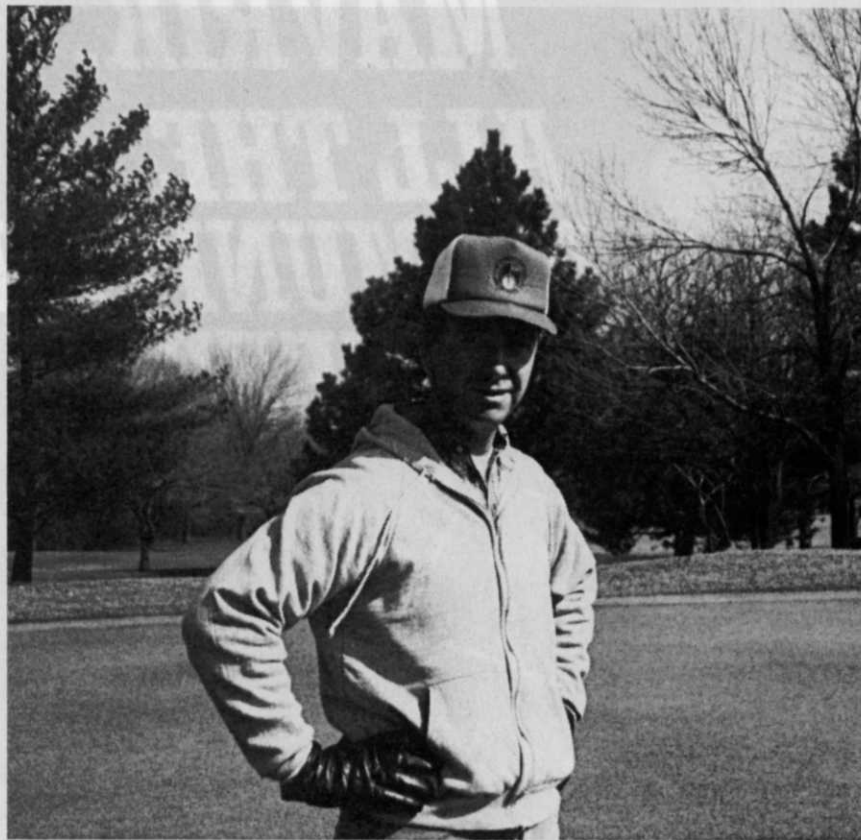
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**SANDOZ**CROP PROTECTION





In three years, superintendent Brian Chalifoux has done a remarkable job in renovating both courses at Olympia Fields Country Club.

"Your grass is covered and you've got a good stand of turfgrass but they don't understand that it's going to take a minimum of three years for the Penncross to mature. We've had a few problems where the heavy play and heavier soils on our greens were slowing this process."

However, most of the North course grasses have come in—but not without some problems, of course. "The failures we had last year were mainly related to shade," Chalifoux explains. "Two of the greens were on poorly drained and heavier type soils. And one of them was 3,500 sq. ft. You're looking at a green that just couldn't handle that much play." (The two courses handle about 50,000 rounds annually.)

"We're still going to have problems growing grass (on the No. 4 green). I think we can do it with some changes in management. Everything is going to have to be right."

The fourth green on the North course was not reconstructed though Chalifoux admits it probably should have been. Instead they have tried to help it in other ways such as pruning trees and actually removing four or five oaks from its vicinity.

Oak pruning is, by and large, contracted out. A thousand have been done so far, but, Chalifoux says, that

hasn't even made a dent toward doing all of them. "We're hoping to get up in about the 50 percent sun range throughout the day," he notes. Along with reducing the shade on affected greens, management practices have been changed to prevent compaction. "The other thing is strictly hand-cutting in these areas: greens, collars and approaches with 22-inch Jacobsen mowers."

Also, the mowing, aerifying and top dressing patterns have been changed. "It's strictly straight runs turning off the greens for both aerifying and top dressing."

#### Questions and answers

The biggest question facing Chalifoux when he closed the North course in August, 1984, was whether the course would be ready for play in the spring of 1985. "(Course management) wasn't sure that this project could be completed because we were doing so much," he remembers. "They were questioning whether or not we could get the golf course opened back up again the following spring—which was legitimate because I wasn't even sure myself."

The answer was yes, but with a bit of luck. Chalifoux figured he would need to have seed down by Sept. 1 to give the

course a fighting chance. The problem was not getting the course prepped for seeding. It was buying seed.

Bentgrass was in short supply, so he had to scramble to get the last 2,000 lbs. of Penneagle for the fairways. (He used 4,000 lbs. of Penneagle for fairways, 500 lbs. of Penncross for tees and greens.)

Everything seemed to be going his way, too. The weather held and extended the growing season well into December. On top of that, spring came early and mildly, and after excellent growth in April, the North course opened May 18, 1985, about two weeks ahead of his schedule.

#### Going south

Renovation on the South course is not as extensive as on the North. "I don't think we're in a situation on the South course where we have forced improvements," Chalifoux explains. "The North was in a situation where it was forced improvements."

One of his major concerns has been bringing the bentgrass ratio up to overtake the poa. In conjunction with overseeding of the aggressive bent, he has been experimenting with Cutless and Scott's TGR to chemically control the poa.

"With the low percentage of poa on the South fairways, we're going to be taking somewhat of a chance applying chemicals before fairways are totally closed in, he explains. "If we suppress the poa at this time, the bent is going to be that much more aggressive and our percentages are going to go higher a lot faster."

He and his staff also renovated seven bunkers last fall and plan to continue this year. The program calls for improved drainage, re-grading and re-sodding around the edges.

They've also finished upgrading cart paths on the North course and have begun on the South course. Some needed repaving and all needed widening, to at least eight feet.

With fairway and green renovation on the South course for the most part complete, the tees remained. Many were mostly poa. "We were having trouble growing grass on them," Chalifoux recalls. "Switching over to the bent, we're able to keep them much drier, and the golfers aren't tearing them up near what they used to."

"They're nice firm tees now. The members call them 'hard tees,' but the wear and tear is much less. It's worked out well.

"This is our turning year here. This will be our third year on the new grass and I think we're pretty much out of the dark now and we should have excellent conditions this year." **LM**



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# FERTILIZATION GUIDE FOR WARM-SEASON GOLF COURSE TURF

Timing is the key to providing golfers with the best playing surface during the year-round warm golfing season.

by Joseph M. DiPaola, Ph.D., North Carolina State University

Superintendents should implement a solid fertilization program in order to maintain good green color on the course.

**A**s summer draws to a close and the cooler weather of fall approaches, golf course superintendents look forward to some annual activities like aerification, winter overseeding, lime applications, renovation and fertilization.

While fulfilling these management procedures, superintendents must also contend with the usual increase in the play of the course, including tournament events. Keys to playable turf are:

- balancing a fertility program to ensure adequate growth to withstand the wear of increased play;
- minimizing the very real risk of

winter injury from excess fertilization of warm-season turf; and

- encouraging the germination and development of winter overseeded grasses with fertilization, which can also increase Bermudagrass growth and thus its competition with cool-season overseedings.

The difference between success and failure often depends on a superintendent's timing of agronomic practices, particularly in relation to environmental conditions.

A good beginning point for planning a late-summer and fall fertility program is to review nutrient and soil pH status record. It is also advisable to

double-check the area of the greens, tees and fairways. Inaccurate judge of their size, which has a tendency to change over time, can result in significant over- or under-applications of nutrients. Soil sample collection at this time also avoids delays in receiving laboratory results typically experienced in the spring.

After adequate soil phosphorus, potassium and pH levels have been attained, greens should be sampled annually, tees every one to two years and fairways every two to three years.

#### Minimizing winter injury

Centipedegrass, bahiagrass and St.



Augustinegrass have only poor to moderate resistance to cold damage; Bermudagrass has intermediate cold tolerance; zoysiagrass is the most low-temperature hardy of the warm-season turfgrasses. Advantageously, Bermudagrass and zoysiagrass have deep rhizomes which typically avoid exposure to low temperature because of their below-ground location. Warm-season turfgrasses without these underground lateral stems cannot fully benefit from protective insulation offered by the soil.

A healthy turf tolerates more types of stresses. Fertilizing under-nourished turf before stress exposure will typically enhance performance. However, once an adequate nitrogen level has been established, undesirable turf responses to additional fertilization are likely. Nitrogen, phosphorus and potassium fertility ratios of 3-1-2 or 4-1-2 should be sought; however, a specific application may need to vary, to compensate for actual soil nutrient levels.

Unlike cool-season grasses, increasing nitrogen fertilization during the fall increases the risk of winter injury to warm-season turf. Nitrogen applications to warm-season turfgrasses at or above 1 lb. N/1000 sq. ft. after October promote leaf development from the crown when the metabolism of this structure should be hardening.

This new flush of growth has resulted in turf winter injury by increasing the temperature at which the turf is injured during the winter. However, like cool-season grasses, fall nitrogen applications will prolong the fall color retention and speed the turf's spring greenup.

Many fertilizer sources including sulfur-coated ureas, urea-formaldehyde reaction products, IBDU, etc., have yet to be evaluated for their impact on winter injury of warm-season turf following fall applications.

Potassium deficiency can result in a weak stand of turf because this nutrient is critical for maximization of cold hardiness, disease resistance and drought tolerance of the turf. Adequate levels of potassium encourage the development of a deep and extensive root system.

Winter injury is a problem for all warm-season turfgrasses, but is of particular concern for northern regions of the transition zone of turf adaptation. Maximizing winter survival will minimize weed infestation and reduce the turf's spring renovation requirements. Potassium applications at 1-2 lbs./1000 sq. ft. have enhanced cold hardiness, but do not alter fall color retention. Late summer potas-

## FALL NITROGEN GUIDE FOR WARM-SEASON GOLF TURF

	August	September	October	November	December
----- lbs nitrogen/1000 sq. ft. -----					
<b>Greens</b>	0.75-1.5	0.25-0.5	—	—	—
Hybrid Bermudagrass	0.75-1.25	0.25-0.5	0.25-0.5	0.25-0.5	0.25-0.5
Overseeded Bermuda					
<b>Tees</b>	0.75-1.25	0.25-0.5	—	—	—
Hybrid Bermudagrass	0.5-1.0	0-0.5	—	—	—
Common Bermudagrass	0.5-1.0	0-0.5	—	—	—
Vamont Bermudagrass	0.75-1.0	0.25-0.5	0.25-0.5	0.25-0.5	0.25-0.5
Overseeded Bermuda					
<b>Fairways</b>	0.3-0.5	0-0.3	—	—	—
Hybrid Bermudagrass	0.25-0.3	0-0.25	—	—	—
Common Bermudagrass	0.25-0.3	0-0.25	—	—	—
Vamont Bermudagrass	0.3-0.5	0.25-0.3	0.25-0.3	0.25-0.3	0.25-0.3
Overseeded Bermuda					
<b>Roughs</b>	0-0.3	—	—	—	—
Common Bermudagrass	0-0.25	—	—	—	—
Bahiagrass	0-0.1	—	—	—	—
Centipedegrass					

The higher application rates are suggested for irrigated areas that have clippings removed, particularly for turf on sandy soils. These suggestions are only offered as a guide. Courses located where the first normal frost occurs before or after the first week in October should shift the calendar to the left or right, respectively.

sium applications will increase the availability of this nutrient at the beginning of the hardening process.

While phosphorus applications have not been found to influence the cold hardiness of warm-season turfgrasses, a high P-to-K ratio has been observed to increase the winterkill of centipedegrass. This response demonstrates that the balance between nitrogen, phosphorus and potassium is important for turf quality and winter survival.

Cold hardiness following fall nitrogen fertilization can be enhanced by including phosphorus and potassium.

Foliar application of iron has been used to improve turf color without the shoot growth stimulation that follows nitrogen fertilization. This color enhancement can occur even in the absence of iron deficiency symptoms (eg. interveinally chlorotic younger leaves). Iron salts (eg. ferrous sulfate) and chelated sources (eg. Agri-Plex, Extra-Iron, Ferriplex 138, Rayplex, Sequestrene 330) are typically applied at 2-8 lbs. of elemental iron per acre (0.75 to 2 oz. of iron per 1000 sq. ft.).

Iron salts are usually a less expensive treatment. Exercise care however, when applying iron near sidewalks, cartpaths, markers or

other objects to avoid staining. Washing immediately after application will minimize staining.

Nitrogen fertilizer applications to warm-season greens, tees and fairways should be gradually diminished at about 60 days prior to the first normal frost. The fertilization requirement of greens exceeds that of tees and that of tees exceeds that of fairways, largely because of the increased demand for greater recuperative rate, clipping removal, more intensive irrigation and sandy soil profiles.

Overseeded turf requires fertilizer applications from fall through spring if optimum turf quality and color is to be maintained. Fertilization rates generally should not exceed 0.5 lb. N/1000 sq. ft. and be repeated every four weeks. Applications should be delayed until the overseeded cool-season grasses have germinated and have been clipped in order to minimize Bermudagrass competition.

Turfgrass fertilization remains as much an art as a science. Decisions on application rates and sources of nutrient carriers are made based on subjective color assessments by the superintendent, budgets and the club schedule as much as they are on the turf's agronomic requirements. How-



ever, the many nitrogen fertilizer carriers now available, particularly slow-release sources, have enhanced program flexibility. Fall fertilization programs are largely driven by the need to prepare the warm-season turf for overseeding or for maximum winter survival while dormant.

**Southern bentgrass**

The growing season for bentgrass greens in the South is shorter than the time between killing frosts. Bentgrass golf greens grow very little during the hot, humid summer months typical of the southern United States. The bentgrass root system will usually become increasingly shallow throughout the summer, so it is critical that root system development be maximized by late-spring.

Supplemental spring applications of potassium at 1 lb. K/1000 sq. ft. can substantially improve

bentgrass rooting.

During the course of a year, bentgrass greens may receive between 5-10 lbs. of nitrogen per 1000 sq. ft. depending upon many factors. Newly-constructed greens typically need nitrogen applications at the upper end of this range. Slow-release fertilizers used during the late-summer and fall should not exclusively contain nitrogen sources that need microbial activity for nutrient release (eg. ureaformaldehyde, activated sewage sludge). Declining soil temperatures during the fall and winter will limit nutrient availability from these sources. Also, nutrient release may occur the following summer when the superintendent wishes to minimize nitrogen levels for reason of heat stress and disease.

Late summer and early fall in much of the southern United States can include many very warm days in-

terspersed with cool spells. Superintendents should resist the urge to quickly aerate, top-dress and fertilize bentgrass greens until cool weather is assured. Waiting until soil temperatures have dropped to near 70 degrees F. is a more reliable guide than air temperatures.

Aerating the greens accelerates soil drying which can increase the water stress experienced by bentgrass during late summer.

Fertilizer applications should not accompany top dressing and drag matting at this time of the year. Placing fertilizer salts on bentgrass leaves during late summer—while this turf's root system is most shallow—will further aggravate water stress should warm weather return. So, if tournament schedules and other factors necessitate an earlier-than-desirable aeration, fertilizer applications should be conducted in a separate operation.

**LANDSCAPE** *Guide* **MANAGEMENT**

**FERTILIZATION GUIDE FOR COOL-SEASON GOLF COURSE TURF**

Golf course superintendents must rely on their powers of observation, and experiment with different fertilization practices.

by David Wehner, Ph.D., University of Illinois

**T**urfed areas are unique. They must withstand traffic, repeated mowing, attack by disease and insect pests and, at the same time, provide a dense, dark-green covering of the soil surface. One of the most important management practices that helps ensure that the turfgrass plant is able to do its job is proper fertilization.

Because each turfgrass area is different, and each turfgrass manager

has a different idea of what is considered acceptable, a single program cannot be written for all areas.

Instead, turfgrass managers should rely on their powers of observation to determine the desired results and experiment with modifications to discover better ways of producing those results.

**Nitrogen fertilization**

Turfgrasses require 16 elements for adequate plant growth. Of these, ni-

trogen (N) is supplied by fertilization in the largest quantities, followed by potassium and phosphorus. Nitrogen sources are characterized by their rate of nutrient release.

Water soluble N sources such as urea, ammonium nitrate and ammonium sulfate provide a short, quick response. Slow-release N sources such as ureaformaldehyde, sulfur-coated urea, IBDU and Milorganite will last longer because they are re-

*continued on page 42*



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leased at a slower rate. Slow-release N sources are more expensive even though quick-release sources may be applied more frequently.

The turfgrass manager should evaluate several sources to determine what type of results fit the budget. Almost any fertilizer, used properly, can provide good results. More expensive fertilizers do not necessarily provide better results.

Cool-season turfgrasses exhibit their maximum growth rate in the spring and fall. Growth slows over the summer because of higher air and soil temperatures. The typical fertilization program on lawns, parks and other turf areas is adjusted to provide more nutrients in the fall and spring than in the summer. A complicating factor on the golf course is that more rounds of golf are played during the summer than in any other season. The superintendent must watch his greens and tees to make sure that there is some turfgrass growth over the summer to ensure recovery from wear.

Fairways are less critical because the traffic is spread out more. Summer fertilization can be done by either applying small amounts of a soluble fertilizer on a frequent basis or by using a slow-release fertilizer. The total amount of nitrogen applied to the putting greens will partially depend on the number of rounds played and the emphasis on putting green speed.

As rounds increase, the amount of nitrogen applied must be increased. Where putting green speed is important, use frequent applications of top dressing along with a moderate N level, moderate mowing height and moderate irrigation practices to increase speed. Fast greens are difficult to maintain where the amount of play is heavy and the N level has been reduced.

Superintendents in the Chicago area have observed that Penneagle creeping bentgrass greens require a higher level of nitrogen than Pennncross or Toronto greens to provide good quality. They are going in the opposite direction with their Penneagle bentgrass fairways. Good results, that is less competition from annual bluegrass, have been observed on these fairways using lower levels of nitrogen.

Some golf course superintendents apply a small amount of urea to the greens when they apply a fungicide. If the urea is being applied with a contact fungicide, and irrigation is withheld to allow the fungicide to work, then some of the N will be lost by ammonia volatilization resulting in an inefficient application.

Apply the urea when a systemic fungicide is being applied and watered in or apply the urea by itself and

	Aug.	Sept.	Oct.	Nov.	Apr.	May	June	July
----- lbs nitrogen/1000 ft <sup>2</sup> -----								
<b>Greens</b>								
Creeping bent		1.0	0-1.0	1.0	0-0.5	0.5-1.0	0.5-1.0	0-0.5
<b>Fairways</b>								
Creeping bent		1.0		1.0		0.5-1.0	0.5-1.0	
Kentucky blue		1.0		1.0		0.5-1.0	0.5-1.0	
Perennial rye		1.0		1.0		0.5-1.0	0.5-1.0	
<b>Tees</b>								
Creeping bent	0.5	1.0		1.0		0.5-1.0	0.5-1.0	0.5
Kentucky blue	0.5	1.0		1.0		0.5-1.0	0.5-1.0	0.5
Perennial rye	0.5	1.0		1.0		0.5-1.0	0.5-1.0	0.5

Use low end of ranges for courses with moderate play, high end for courses with heavy play. Use higher N on Penneagle greens. Use low end of range if fairway clippings are returned or to combat annual bluegrass. Maintain good fertility on perennial ryegrass fairways to help reduce the severity of red thread. Tee program should be adjusted based on number of rounds and size of tees.

water it in. Many superintendents are reluctant to use a liquid fertilizer on their putting greens.

Several liquid fertilizer products being used by the lawn care industry have a place on the golf course. They can be applied with a sprayer at a higher N rate than urea without fear of burning the turf. Fall fertilization, both in the early fall to speed recovery of the turf from summer stress and in the late fall to promote color retention into the winter and early spring greenup, is extremely important on all turfgrass areas. Research conducted at Ohio State University has shown that late fall fertilization promotes root growth in an indirect way.

Turf fertilized in the late fall has a reduced need for early spring nitrogen fertilization. Nitrogen fertilization in the early spring can decrease root growth. Also, because there is generally a flush of growth during the spring due to increased moisture, the first fertilization should occur in late spring.

Recent research conducted at the University of Illinois evaluated late fall applications of IBDU, sulfur-coated urea and urea for their effect on spring color. With sulfur-coated urea and urea, a November application resulted in superior spring color compared to where these same fertilizers were applied in September. With IBDU, a September application resulted in turfgrass color equivalent to where the IBDU was applied in November. Better results for the year were found where IBDU was applied in June and September than in June and November.

Although the greatest plant response is caused by nitrogen fertilization, the

other elements are certainly important in the overall health of the plant.

**The other elements**

A basic recommendation regarding the use of nitrogen, phosphorus (P) and potassium (K) is to apply these elements in a 3:1:2 (N:P:K) ratio. This recommendation is based on the fact that turfgrass tissue contains N, P and K in approximately this same ratio.

However, consider the points listed below when planning the rest of your fertilization program.

**1. Potassium fertilization.** There is a trend to apply higher levels of potassium to turfgrasses. This means applying an amount of potassium equal to or greater than the amount of nitrogen applied. Research reported by Bob Shearman, Ph.D. and Jim Beard, Ph.D., in 1975 indicated that increased levels of potassium resulted in improved wear tolerance of Toronto creeping bentgrass.

Currently, Shearman is studying the effect of potassium fertilization on both creeping bentgrass and Kentucky bluegrass on both heavy and light textured soils. He recommends a 1:1 ratio between nitrogen and potassium. You may want to try higher levels of potassium on an area that gets a lot of wear to judge the results.

Remember that potassium chloride (muriate of potash) can burn the turf if applied under the right conditions. Potassium sulfate (sulfate of potash) has a lower burn potential than potassium chloride.

**2. Phosphorus fertilization.** The trend with phosphorus applications on golf turf has been to apply as little as possible. This practice resulted

*continued on page 43*



# Blue Chip Nitroform &

## CORE CULTIVATION

TURF MANAGEMENT REPORT NUMBER 1



### Blue Chip® Nitroform® and Core Cultivation



Aerification by core cultivation followed by the application of Blue Chip® NITROFORM® offers an innovative approach to improving, renovating, and/or overseeding existing turf. This combination of cultural practices stimulates regrowth and vigorous, sustained development of the root system while reducing thatch to more manageable levels.

The leading cause of weakened turf is too heavy an accumulation of thatch, the layer of brown, dead residue from old roots and crown tissue immediately underlying the surface. A small cushion of thatch is desirable and natural. But when the accumulation exceeds 1/4 inch, it becomes a barrier to the percolation of water and nutrients. Excessive thatch results from too rapid growth accompanied by the accumulation of the thatch-forming tissues at rates faster

than soil microorganisms can decompose them. Because water and nutrients are bound in the thatch, this area becomes the primary medium for the live roots—roots frequently so shallow that the turf is poorly equipped to withstand stress from drought, heat, cold, insects, and disease. The effects of compaction from heavy play and equipment are compounded in turf with excessive thatch since there is so little reserve of root system capable of generating new growth.



Turfgrass agronomists agree that the best means of reducing thatch is by core aerification (core cultivation). Hollow tines on the aerifying machines remove cores (plugs) of thatch and soil, leaving the subsurface accessible to water and air, and allowing the soil from the plugs to filter back in the holes and into the interface to mix with the remaining thatch. Moisture penetrates more readily, and live roots are encouraged to expand deeper through the soil profile.

#### Why NITROFORM® Following Core Cultivation?

NITROFORM provides slow-release organic nitrogen to sustain both plants and soil bacteria over many weeks of the growing season. Its 38 percent nitrogen is linked with carbon in low molecular-weight polymers of methylene ureas, over two-thirds of which is water insoluble. The degree of water-insolubility of the polymers determines the rate of nitrogen release. The more soluble components are less resistant to bacterial degradation (digestion), and release nitrogen over the first few weeks following application. The insoluble fractions continue to gently release nitrogen gradually during the growing season in sufficient quantity to support microbial activity and root formation without overstimulating vegetative growth. In the fall, as daily temperatures gradually decline, much of the nitrogen released from



NITROFORM nitrogen becomes stored in the roots. For turfgrass, this is healthy physiologically, and promotes early green-up the following spring.

### Effect of NITROFORM® On Thatch

In a two-year study of nitrogen sources on lawn-care test plots at the University of Illinois, researchers observed that Kentucky bluegrass fertilized with NITROFORM (4 lbs. N per 1000 sq. ft. per year × 2 years) produced the least amount of thatch when compared with other nitrogen sources commonly used in professional lawn care. In fact, there was less thatch than measured in the no-nitrogen control. It is logical to assume the increased bacterial activity in NITROFORM-fertilized turf helped to keep the thatch in check. Other factors which may contribute to this phenomenon include the absence of rapid growth, commonly associated with thatch formation, and the fact that NITROFORM is only mildly acidic in its soil reaction. Strong acidic reactions of some fertilizers, e.g. ammonium sulfate, may discourage a favorable environment for beneficial soil microorganisms at the soil/turf interface.

NITROFORM is, in effect, a soil-activated fertilizer. It supplies food and energy (nitrogen and carbon) to soil bacteria. The bacteria, in-turn, gradually convert the nitrogen to forms available to plants. Applying NITROFORM following core aerification provides the opportunity to place it in direct contact with the soil. Not only is thatch reduced by mechanical coring, the NITROFORM will help sustain the bacteria responsible for decomposing accumulations of new thatch-forming tissues.

### Application Rates For NITROFORM®

The rate to apply depends on the level of fertility the turf is currently under and the severity of its physiological condition. The minimum rate should be 3 lbs. 38-0-0 NITROFORM (1.14 lbs. N) per 1000 sq. ft. immediately following core cultivation. The following are guideline recommendations for typical turfgrass situations.

#### Lawns and commercial turf areas, athletic fields, fairways and tees:

3 to 5 lbs. NITROFORM 38-0-0  
(1.14–1.9 lbs. N) per 1000 sq. ft.

Use the higher rate when overseeding or when the turf requires extensive renovation.

---

#### Greens:

3 lbs. NITROFORM 38-0-0 per 1000 sq. ft. If greens are pale, or if the root system is shallow or restricted in the thatch layer, apply 5 lbs. NITROFORM 38-0-0 per 1000 sq. ft. NITROFORM can be applied at the time of top-dressing and swept into the aerifying holes. There may be some temporary color mottling which should smooth out in a few weeks, and is not harmful.

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#### When to Core Aerify and Apply NITROFORM®

Whenever turf is stressed because of compaction and/or excessive thatch, core cultivation is appropriate. Aerifying during periods of hot weather should be avoided where irrigation is restricted or non-existent. Regeneration and growth of roots and rhizomes will be more vigorous in spring and fall, and late summer is usually the best time to overseed cool-season grasses following core cultivation.





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This first Turf Management Report covers the advantages of core cultivation (aeration) in overcoming thatch problems and encouraging more vigorous turf. It also describes the benefits of following up core cultivation with the use of NITROFORM slow-release nitrogen to assure the development of healthier turf on lawns, golf courses, parks and other areas.

NOR-AM will be creating additional Turf Management Reports from time to time to help your business. If you have any comments or suggestions, or would like additional information, do not hesitate to get in touch with me or your NOR-AM representative.

Sincerely,

B.J. Bilas  
Marketing Manager







from the observation that annual bluegrass encroachment was greater where phosphorus levels were high. Also, the use of tricalcium arsenate to control annual bluegrass dictated that phosphorus levels be low since phosphorus counteracted the toxicity of the tricalcium arsenate. Some recent observations have indicated that the turf's stress tolerance is reduced under low levels of phosphorus.

It would be wise to take periodic soil tests to monitor the phosphorus level especially where clippings are being collected. Don't entirely eliminate phosphorus from consideration in your fertility program.

**3. Lime.** Lime applications are necessary when growing Kentucky bluegrass on acid soils. Maintaining the proper pH in the soil will help ensure the maximum rate of thatch decomposition.

**4. Sulfur.** Just as lime applications can be used to raise soil pH, sulfur applications can be used to lower the soil pH. The reason for lowering the pH is to provide a better medium for plant growth. Some nutrients are not available to the plant at a high soil pH.

Ideally, sulfur should be incorporated into the seedbed before planting

since it reacts slowly. It is important to be careful when using sulfur on established areas. Do not make large applications at any one time. Since the sulfur breaks down slowly and moves slowly, you can end up with an extremely low pH in the thatch layer. Consider applying sulfur after core cultivation.

Use soil tests to determine whether it is feasible to lower the soil pH with sulfur. Sometimes it is difficult to apply enough sulfur to lower the soil pH when the water used for irrigating the turf has a high pH or where free calcium carbonate is present in the soil.

Sulfur has been applied to creeping bentgrass putting greens to discourage the growth of annual bluegrass since the bentgrass can tolerate a low pH but annual bluegrass cannot. Flowable forms of sulfur are preferred to granular forms for applications to greens. Before starting a sulfur program on greens, consult with your state turfgrass extension specialist for information about using sulfur.

**5. Iron fertilization.** Iron applications may be necessary in parts of the country where soil pH is high and iron in the soil is not available to the plant. Iron can also be used to enhance the color of the turfgrass stand in areas of

the country where iron deficiencies are not common. Iron sulfate applied at a rate of 1-2 oz. per 1000 sq.ft. will provide a response for several weeks. The actual length of the response will depend on the growth rate of the turf. Iron is not translocated in the plant. Once the treated tissue is mowed off, the response will fade.

**6. Micronutrients.** Applications of micronutrients (iron, manganese, zinc, copper, molybdenum, boron and chlorine) may sometimes be necessary on pure sand putting greens because of the low nutrient holding capacity of the sand, but they are rarely if ever needed on turfgrasses growing on pure soil or a mix containing soil.

With careful planning, a good fertility program can be developed for the golf course. It is important to realize that weather conditions can dictate departure from the basic plan. Do not be afraid to experiment with different programs.

Finally, seek help from a fellow superintendent if you are new in an area and unfamiliar with the weather patterns or the history of the golf course. Most superintendents are glad to help someone be successful. **LM**

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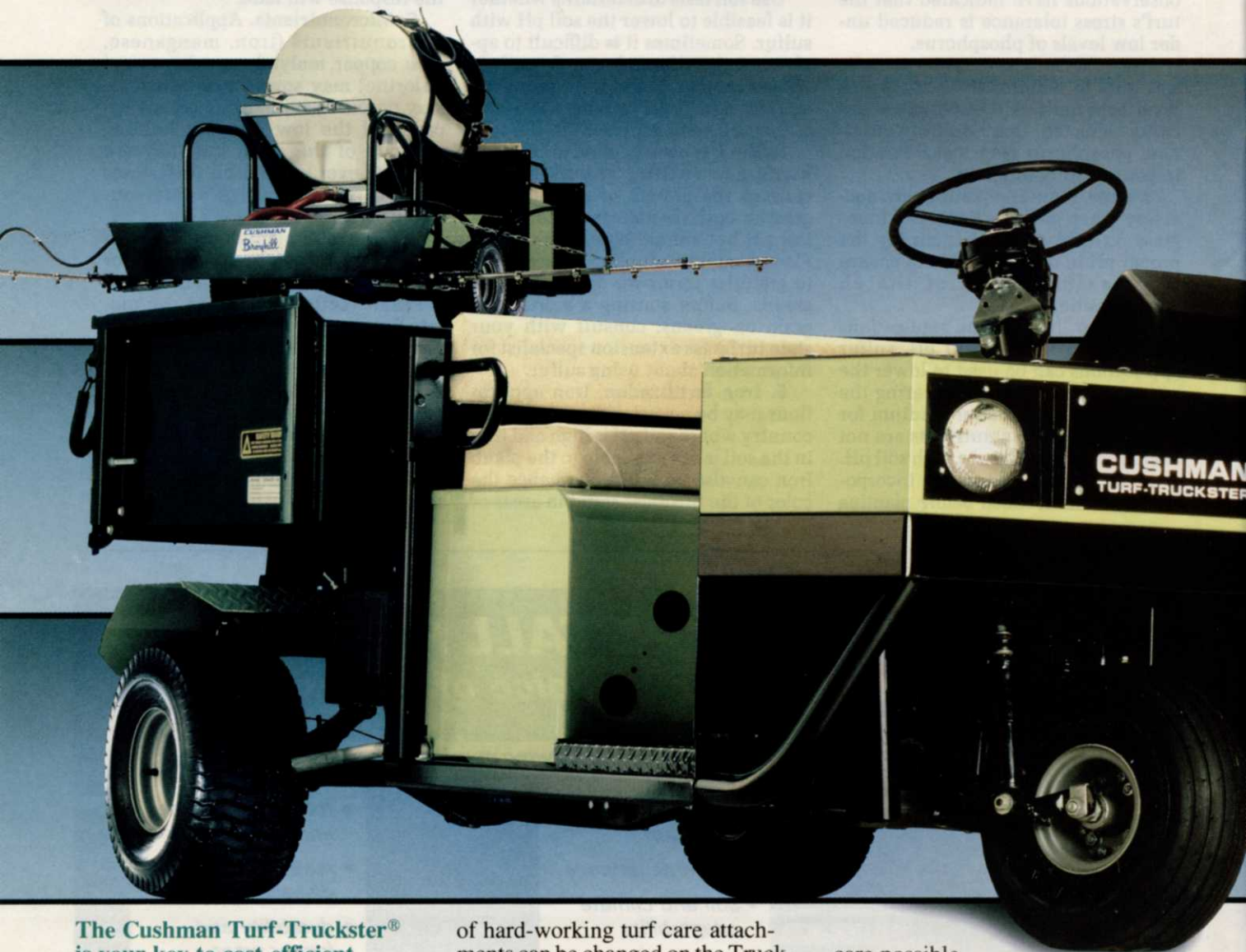
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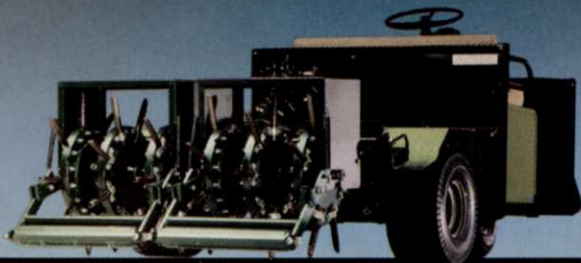
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# ANATOMY OF AN I.P.M. PROGRAM

With concern over pesticide use, more cities are turning to Integrated Pest Management. IPM controls insects through spot treatments and cultural methods.

by Deborah Smith and Startan Gill



Montgomery Village cut costs by more than 55 percent over two years when they implemented an I.P.M. program.

**P**rofessional landscape managers need to be concerned with efficient pest control programs designed to keep the customer happy, provide maximum plant protection, and provide a healthy profit.

For years, cover sprays have been the traditional method of pest control. A blanket spray on all landscape plants is assumed to prevent possible

pest problems. However, preventive sprays may actually produce some detrimental side effects in urban areas; such as increased pest resistance to pesticides, resurgence of target pests following treatment and outbreaks of secondary pests once the target pest has been killed.

An additional problem associated with pesticide use in urban settings is the environmental hazard resulting from drift to non-target treatment areas.

Incidents of pesticide misuse are sensationalized by the media. Insurance rates for pesticide applications

have increased 200 to 300 percent from previous years. Insurance companies are hesitant to insure pesticide applicators because of the problems with liability insurance. Many homeowners are thus questioning the required frequency of pesticide applications around their homes.

In Maryland, for example, environmental groups and concerned citizens have successfully petitioned local government in two counties to enact legislation requiring the posting of signs for each lawn pesticide application. Likewise, Maryland barely voted down a bill requiring such restrictions

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Deborah Smith is with the Prince William County Cooperative Extension Service, Manassas, Va. Stanton Gill is with the Montgomery County Extension Service, Gaithersburg, Md.



on commercial application of pesticides on residential lawns and landscapes.

If this trend continues, landscape managers will have to look at ways to modify spray tactics so that the public is convinced that pesticides are being used in the absolute safest manner and only when absolutely necessary.

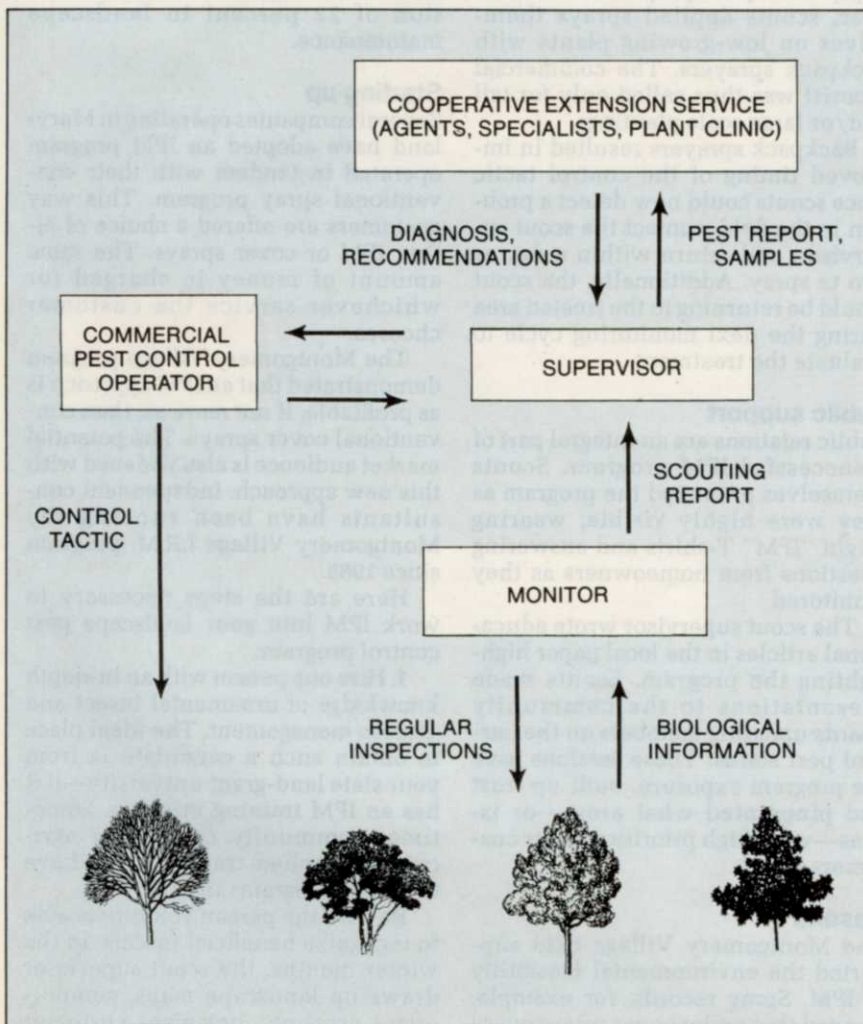
Customers ironically want complete protection from pest damage but do not wish to have pesticides over-used around their homes. Are there presently any viable substitutes to cover sprays?

Research has tested a management concept called Integrated Pest Management in urban landscape settings. I.P.M. programs use a monitoring program in which landscapes are regularly inspected for cultural problems, insects and disease pests. Cover sprays are eliminated; instead, individual plants (hot spots) are spot treated with the least toxic pesticide available once the pest is noticed. Control material could be a biorational (such as *Bacillus thuringiensis*, milky spore or insecticidal soap), or a short residual, low toxicity pesticide,

Table 1  
**ENVIRONMENTAL AND ECONOMIC IPM IMPACT**

Community	1982		1983		1984		2 Year Average	
	number of plants sprayed	cost of spray \$	number of plants sprayed	cost of spray \$	number of plants sprayed	cost of spray \$		
A	738	2,985	78	784	142	822	83	55
B	914	3,750	66	1,663	136	2,986		
C	195	1,325	107	510	128	401	22	
Total	1,897	7,970	251	2,957	406	4,209		
Labor Cost* \$	0		2505		4209			
Final Cost \$	7,970		5,462		6,988			

\* includes salaries of 2 scouts in 1983 and 4 scouts in 1984



such as a synthetic pyrethroid.

Sprays are eliminated or curtailed when natural predator and parasite insect activity is observed controlling the pest.

Urban I.P.M. programs have been tested in residential landscapes, city street trees and institutions. These programs have shown that I.P.M. methods control pests even better than do cover sprays, primarily since monitors (scouts) observe and control pest populations before they reach damaging levels.

Environmentally speaking, the amount of pesticide used is reduced when cover sprays are replaced by spot sprays, which in turn reduces the potential risk of human exposure.

Research has shown that I.P.M. programs not only control more pests, but also have lower pesticide costs than cover spray programs. However, labor costs are higher because of the time scouts spend monitoring landscapes. Considering this, is I.P.M. an economically feasible venture for a commercial company?

To answer this, the University of Maryland Cooperative Extension Service set up a demonstration I.P.M. program in 1982 in Montgomery Village, a planned community in suburban Maryland. People in the community wanted the program for two major reasons:

(1) they felt their present eight-year cover spray program was giving inadequate pest control for the money



they were spending; and

(2) they actively expressed concern over what they perceived as hazardous pesticides being applied unnecessarily.

Our solution was to set up a comprehensive pest management program in their community. Using previous Maryland I.P.M. programs as guidelines, our goal was to eliminate preventive sprays and thus limit treatments only to active, damaging pest infestations. The Montgomery Village program was started in 1983 on 354 acres. In 1984, the success of the program led to an addition of 122 acres, bringing the total land area to 476 acres. The program covered common ground plants, street trees, community centers and parks and recreation sites amidst single family homes and townhouses involving 3850 residents.

### Program organization

The program was set up in such a way that all scouting activities were coordinated by a scout supervisor specifically hired to oversee the program. Each community was monitored at two- to three-week intervals.

Undergraduate plant science students from the University of Maryland were hired as scouts; however, experienced gardeners from the area were found to make excellent part-time scouts. Scouts were trained before the onset of the monitoring season (April to September) by cooperative extension agents.

The training topics focused on plant and pest identification, insect and disease problems and plant stress factors. After completion of a plant inventory in each community, a list of the most abundant plants was used as a basis for training. By knowing the most common plants, the pest complex could be predicted and emphasized during training. Supplemental training was supplied at monthly scout meetings by the scout supervisor.

For programs in townhouse communities, which typically had a wide variety of densely-planted plant material, rough landscape maps were sketched and monitoring notes were made directly on these maps by field scouts. For larger communities, these maps were too time-consuming to draw, so street maps provided by the builder were used to pinpoint large scale pest populations for spraying. Scouting notes were then written on printed forms detailing location, condition, and the number of plants affected by the observed problem.

### Spray recommendations

The scout supervisor compiled all



**Extension agent Deborah Smith checks plant material for insect damage.**

scouting information and coordinated control recommendations among communities. During the program's first year, all control recommendations were supplied to the community maintenance director, who contracted with a commercial arborist to apply the spot sprays. The second year, scouts applied sprays themselves on low-growing plants with backpack sprayers. The commercial arborist was thus called only for tall and/or large scale plantings.

Backpack sprayers resulted in improved timing of the control tactic since scouts could now detect a problem in the field, contact the scout supervisor, and return within a day or two to spray. Additionally, the scout would be returning to the treated area during the next monitoring cycle to evaluate the treatment.

### Public support

Public relations are an integral part of a successful IPM program. Scouts themselves promoted the program as they were highly visible; wearing bright "IPM" T-shirts and answering questions from homeowners as they monitored.

The scout supervisor wrote educational articles in the local paper highlighting the program. Scouts made presentations to the community boards updating members on the current pest status. These sessions gave the program exposure, built up trust and pinpointed what areas—or issues—were high priorities to our customers.

### Results

The Montgomery Village data supported the environmental feasibility of IPM. Spray records, for example, showed that under cover sprays every

evergreen (totalling 567 trees) in the program area was sprayed twice a year for bagworms—regardless of whether they were infested or not.

IPM monitoring showed that only 19 trees had a high enough bagworm population in 1983 and 1984 to warrant a spray. All in all, only 657 plants were sprayed over the two-year IPM program—an 83 percent reduction in the number of plants sprayed as compared to one year of cover sprays.

The majority of these sprays were for mid-to-late season pests, such as orange-striped oakworm, which were never targeted by early season cover sprays.

In 1982, the year preceding the program, \$7970 was spent on three pesticide cover sprays plus two citizen request sprays. IPM spray costs averaged \$3583 a year, yielding a 55 percent cost reduction over two years. This demonstration was quite labor intensive due to regular monitoring.

Scout salaries in three communities averaged \$2426 per year. When salaries are included in program costs, the entire IPM program averaged \$6009 per year—but even this represents an average annual cost reduction of 22 percent in landscape maintenance.

### Starting up

Several companies operating in Maryland have adopted an IPM program operated in tandem with their conventional spray program. This way customers are offered a choice of either IPM or cover sprays. The same amount of money is charged for whichever service the customer chooses.

The Montgomery Village program demonstrated that an IPM approach is as profitable, if not more so, than conventional cover sprays. The potential market audience is also widened with this new approach. Independent consultants have been running the Montgomery Village I.P.M. program since 1985.

Here are the steps necessary to work IPM into your landscape pest control program:

1. Hire one person with an in-depth knowledge of ornamental insect and disease management. The ideal place to obtain such a candidate is from your state land-grant university—if it has an IPM training program. Sometimes community colleges or agriculture/applied trade schools have two-year programs in IPM.

- Be sure the person you hire is able to recognize beneficial insects. In the winter months, the scout supervisor draws up landscape maps, computerizes accounts, organizes customer

*Continued on page 50*

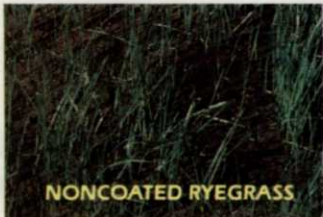




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records and drums up business. Prior to the onset of the growing season, he or she trains a few regular employees in landscape plant identification, pest identification and control, and plant environmental (stress) problems.

This initial training covers the most prevalent pests ("key pests") and past problems recorded in customer accounts, as determined by spray records. When a list of the most abundant plants scouted in the property is used as a basis for training, the pest complex of these can be predicted and emphasized during training.

One precaution: companies that have tried to use an employee who has been using cover spray methods for years as a program manager have met with failure. It is difficult to change attitudes of people ingrained with cover spray concepts.

It is preferable to hire someone who has been trained in the methodology of IPM if the program is to work for your company. The manager must be familiar with beneficial insects, cultural and mechanical controls, biorational pesticides, and pesticides.

2. Define the type of customer you wish to work with. Will you take on

residential home landscapes, community common ground landscapes, or commercial building landscapes? Each of these different landscape situations requires different time commitments for a monitoring program.

The average ½-acre residential landscape takes 30 to 40 minutes for a thorough inspection in the spring, and 15 to 20 minutes by midsummer when fewer pests are active.

3. Decide on how many customers you can handle. One good scout supervisor should be able to handle 40-50 half-acre residential homes per season. Once the program is established, future expansion can be planned based on how many field personnel the scout supervisor can train to perform the monitoring.

4. Contact your local extension service for help. Extension agents in urban agriculture are experts in plant diagnosis.

5. Decide on a price for your service. Most companies presently using IPM are charging the same amount charged for cover sprays. We suggest determining how often during the season the location will be monitored, how much time is required for personnel to be on location, then add

your profit margin.

Disregarding periodic insect outbreaks, your contracts should become easier to maintain over the years once pest populations are pinpointed and managed under regular monitoring.

6. Advertise your IPM program and let customers know of its advantages. An article in a local paper is a great way to get your message out to the public. Don't forget your regular customers; let them know they have a choice of programs. It is most likely that new customers are the ones who will be most interested in this approach of pest control.

7. Print up a brochure advertising your IPM approach with a simple explanation of what the program entails. Be sure to emphasize the objectives of the program; including reduced pest damage, use of natural controls and resistant plant material, selectivity and timing of pesticides, and a reduction in the number of plants being sprayed.

8. Become familiar with IPM research. Get copies of past research programs, and talk to those involved. True IPM programs are very similar in methodology, yet actual organization may differ. **LM**

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## A Scotts Tech Rep's Family Snapshot.

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# THE PATH TO PAVING

by Heide Aungst, managing editor



Visitors to the Mercado Festival Center's stores and restaurants may feel like they're in a Mediterranean Village. Landscape architects Wallis Baker & Verlander of Winter Park, Fla. worked with architect McRee, Inc. of Orlando, Fla. to create that Mediterranean flavor with more than 73,000 square feet of courtyards, walkways, plaza and the entrance drive.

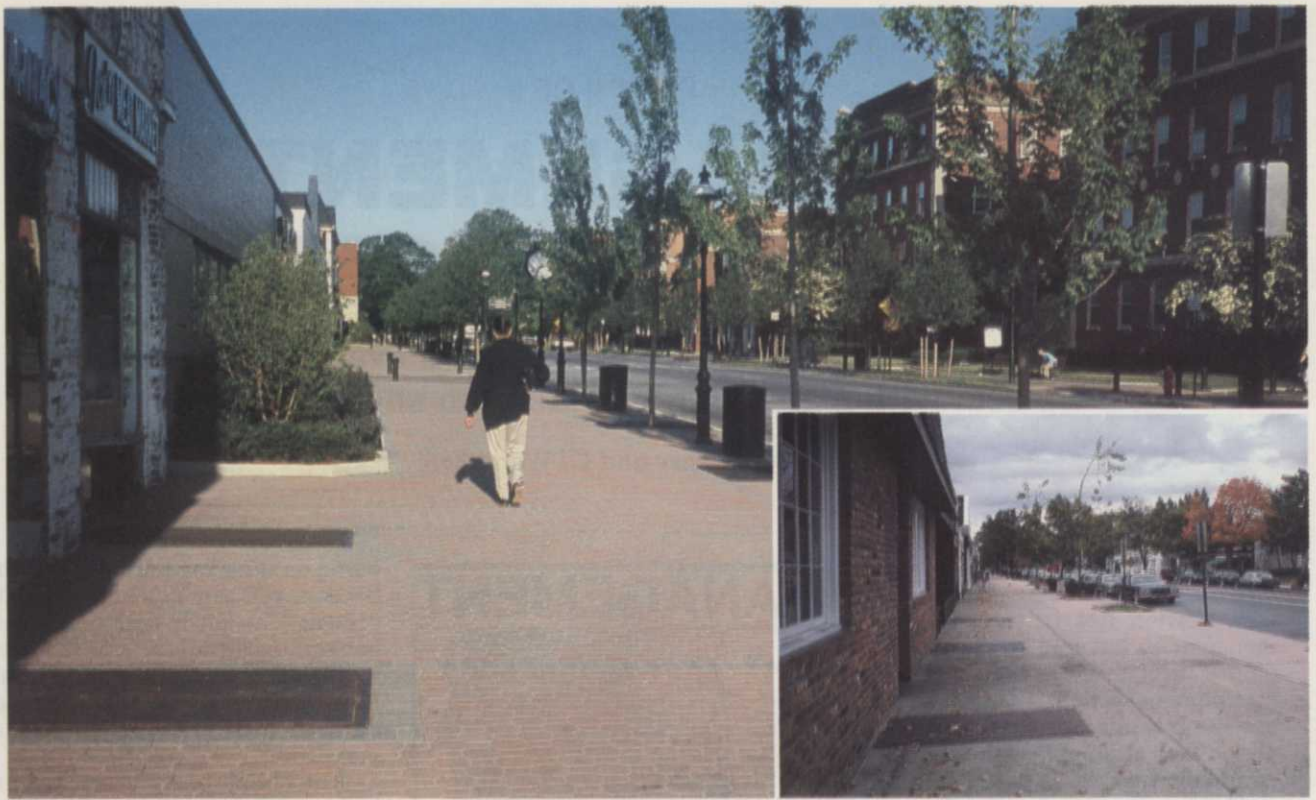
"We tried to get as much color as possible with the introduction of material the tourists would like to see" says landscape architect, Tom Wallis. Wallis developed that tropical look with lady fan palms, European fan palms and Drake elms. As a ground cover he chose large mondograss. Red ruffle azeleas and wax-leave begonias add color to the green area.

The paving systems add more than color to the area. "They create interest with texture and shape," Wallis says. Plant materials and irrigation for the project cost about \$300,000. It won a 1986 honor award from the National Concrete Masonry Association.

**Uni-Group Paving, Circle No.191 on Reader Inquiry Card**







**T**he Village of Garden City, N.Y. had a problem. Its main street of business, Seventh Street, was a conglomeration of concrete and irregularly placed plant material. Some described Seventh Avenue as "uninviting" (before photo above inset). Enter: landscape architect William Kuhl of New York, N.Y. Kuhl created a new visual identity and sense of design continuity to the region.

His primary source in doing this was the use of Grinnell Concrete Pavingstones. The pavers establish a rhythm for pedestrians, in both

pattern and color (above; below). The interlocking pavers require low maintenance and have a non-slip surface.

In order to offer a vertical element to the design, Kuhl chose three types of trees to line Seventh Street: Armstrong red maples, little leaf lindens and zelkovas.

The maples have an upward growth habit which makes them ideal for a busy street. A broad spreading tree would interfere with vehicles' sight lines. The architect put the lindens in front of stores which have aesthetically poor

facades because of the trees' dense canopies. The zelkovas will frame the end of the street which has residential and multi-story buildings (below). Flowering trees, including stewartia and laburnum, will provide color and fragrance in early spring. The landscape contractor for the project was Hecksher Nurseries of Bohemia, N.Y.

The Seventh Street Project began in August 1986 and was completed in December 1986. Cost for the project was \$800,000.

**Grinnell Concrete Pavingstones, Circle Number 190 on Reader Inquiry Card.**





# MANAGEMENT EVALUATION

Last month we offered some ideas on personnel evaluation. This month we deal with management evaluation and assessment.

by Rudd McGary and Ed Wandtke

**T**he big difference between personnel and management evaluation lies in the ability of managers to have an effect on companies through more than just their own personal actions. Managers manage either assets or personnel through which they attempt to reach the company's objectives.

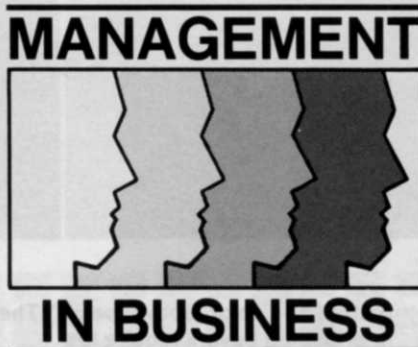
Since more people than just the manager are involved, evaluation methods and criteria are different than those we presented for personnel in our last column.

## Evaluating control

The key to making a management evaluation work, at least in part, is to be sure that the evaluation focuses on those things under the manager's control. For instance, managers being evaluated on sales growth should have some ability to control that growth. If bottom line profitability is being measured, the manager should be able to affect that bottom line.



Wandtke and McGary are senior consultants with All-Green Management Associates in Columbus, Ohio. Dr. McGary focuses on marketing and management issues. Wandtke focuses on operations and financial questions.



A second important factor in assessing managers is that some plan must be in place against which to measure the managers. We have written several columns dealing with the planning function as one of the most important parts of a manager's job. In preparing an assessment, the plan is the instrument that gives a basis for evaluation. Without the plan, the assessment will be a totally subjective one, which can lead to misunderstandings between the managers and their superiors.

So, we need a plan on which are three assessment levels. On the first level, the manager fails to make satisfactory progress towards fulfilling the plan. In that case, some sort of corrective action needs to be taken. On the second level, the manager makes the "average" plan, the one which is acceptable but not exceptional. On the third level, the manager goes above plan, showing exceptional effort and management talent. By keeping in mind these three levels, you have the beginning of a management evaluation program.

Now, on to possible areas that can be evaluated for management performance.

## Financial

Managers can be assessed in several ways financially. First, you may look at their contribution to profitability

based on their section's performance. Second, you can look at their control of costs. The key to both of these is to be working against a written forecast for the appropriate time period and to make sure that the managers have control over the things you are measuring.

An example of a poor assessment is looking at bottom line profitability as a measurement of a small company's management effectiveness. While doing so, you, the owner, decide that at the year's end you will give yourself a large bonus. Clearly the manager should be evaluated before you take any extraordinary actions. The manager who can't control the bottom line in this case shouldn't be measured on it.

## Marketing objectives

If you are a sophisticated company, with a great deal of market information, you can begin a marketing evaluation with growth in market share.

If you don't have a clear picture of the overall market's worth (and most small companies find it too time-consuming to arrive at a true figure in this area), you can look more closely at sales figures. In sales you can look at:

- closing ratios for the salespeople;
- overall growth in revenue;
- the number of "cold" calls;
- the ability of the manager to meet overall sales plan objectives;
- sales force retention; and
- the profitability of the sales force based on all the costs allocated to that force.

All of these areas are ones which can be under the control of a manager, and as such are ones which offer good information when you evaluate them.

## Asset use and control

In looking at the manager from the standpoint of asset utilization and control, you should be aware of the best way to leverage the company's assets, and that awareness should

*continued on page 61*

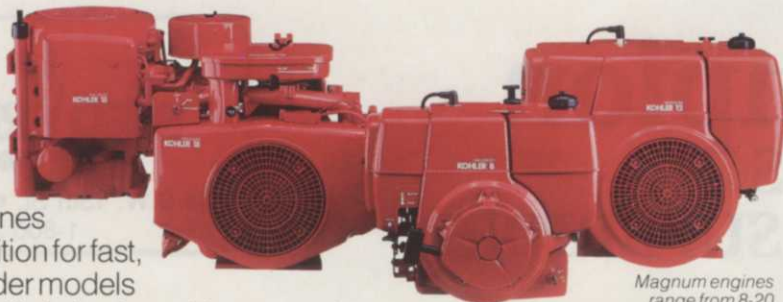




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# THE PLANNED COMMUNITY

It took 25 years, but the original plans for the town of Columbia, Maryland, have finally been realized. Landscaping plays an important role.

by James E. Guyette

In 1962, the Rouse Company of Columbia, Md., began buying rural property in Howard County. The firm's plans to build a pre-designed community were to be realized, as today Columbia is a bustling city containing about 60,000 people and approximately 1,500 businesses.

Columbia is about 20 miles from Baltimore and 25 miles from the District of Columbia.

Residents of Columbia live in a series of "villages" that encircle a down-

town area that is billed as the focal point of the Washington-Baltimore corridor.

Each village contains a community building, grocery store and other retail outlets designed to meet the needs of each citizen. A jumbo shopping mall, a number of commercial operations and a light industrial park make the city basically self-sufficient.

When in the planning stages, the Howard Research and Development Corp. (a subsidiary of Rouse) hired a number of experts to devise the perfect community. They made such suggestions as having neighborhood schools and activity centers and pre-

serving the natural contour and beauty of the then-fallow land.

There are nine villages. A 10th is in the planning stages. Each village has three neighborhoods with 600 to 800 dwelling units. A series of pathways cross open space and lead to schools, "totlots" (playgrounds) and other amenities. Also, Columbia is graced by a number of man-made lakes.

Of the 14,000 acres in Columbia, 1,500 of them are classified as open space. In the future, that figure will jump to 3,000 acres.

Upkeep of individual yards is the responsibility of the landowner. The open space falls under the supervision of Charles H. Rhodehamel, ecologist and land manager at the Columbia Park and Recreation Association, Inc.

About \$500,000 is spent each year on turf-related activities, including mowing, trimming and seeding.

A big factor in Rhodehamel's line of work is that the open space is used for multiple purposes, from baseball to dog-walking to jogging to outdoor concerts to Frisbee-tossing.

"You can't say, 'Get the hell off my turf—you're killing my grass,'" Rhodehamel jokes. "It's not something that we can close down in certain sections."

The extensive use of turf areas means that the maintenance crew is not seen out in the field after residents start arriving home from work.

The open space abuts most of the yards and public areas, such as the maze of paths, 130 totlots and about 200 wooden foot bridges.

"Spraying is minimized because we touch on so many private properties," Rhodehamel says. Liming and fertilization are used, but Rhodehamel points out that his grass does not have to look perfect: "Our goal is not professional baseball infield turf."

Verticutting and aeration are done when needed. He says pests and fungi are not big problems.

Rhodehamel has four working foremen. There are 30 men on the lawn maintenance crew and 15 on the land development crew. They cover a number of different areas: carpentry, grading, seeding and asphalt. **LM**

James E. Guyette is associate editor of "Lawn Care Industry" magazine, another HBJ publication.



Charles Rhodehamel, ecologist for The Columbia Association, closely checks the turf at one of the community's open spaces.



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translate into your planning.

For instance, if you have three vehicles, you should have a plan which shows how much revenue you expect to achieve through use of these vehicles. That becomes the standard against which the manager is evaluated.

Some young companies fall into the trap of looking at assets on a time basis rather than a revenue basis. They look at how often something is

usage basis.

You should also look at downtime of assets. The more breakdowns you have, the less revenue you will generate. This is a key part of asset management, preventive maintenance, and is one that should be evaluated from the standpoint of management effectiveness.

Asset custody and safety should also be evaluated. Assets should be accounted for and controlled to avoid

the routes, the manager can greatly improve efficiency, and in turn use the assets better.

You should also make sure that, in their evaluations, the rate of call-back and service calls goes down because of management attention.

### Summary

Assessing managers is a different process than assessing personnel. The planning that is part of managers' positions gives a guideline to effective evaluation.

You must keep the fact that the manager is controlling more than just himself or herself in clear perspective. Their job is to work with others in order to achieve company objectives. The need to allow the managers control over the variables on which they are being evaluated is extremely important.

We have seen companies assign jobs to managers without giving them the necessary authority to finish the jobs. If you combine a good planning system, evaluate against the planning done, and give the managers the authority to do their jobs, you should have a successful system in place that will help you evaluate the true effectiveness of your managers. **LM**

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*If you have three vehicles, you should have a plan which shows how much revenue you expect to achieve through use of these vehicles.*

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used rather than how much revenue is generated. All the vehicles in the above example may be used 12 hours a day, but that doesn't matter much if you don't receive enough revenue from that operating time.

Make sure you know how much each of your assets can contribute to the company and then evaluate them on a revenue basis or cost control basis, rather than on simply a time

misuse of vehicles or inventory in the company's operations.

### Operations efficiency

Operations efficiency is closely linked to asset management but has the personnel variable in it. You can evaluate how well crews are routed or how well equipment is used.

Time spent in transit is not usually billable as revenue. By tightening up

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# HYDRAULIC MULCHES: PAPER VS. WOOD

Hydraulic mulching is a growing practice among landscapers, but it has yet to reach its full potential.

by Heide Aungst, managing editor

**W**hat used to be somewhat of a novelty in the landscape business has become a common occurrence. In fact, William Jacobsen, president of Conwed Fibers Inc., goes so far as to describe hydraulic mulching as "a renaissance."

It used to be that hydraulic mulching was limited to land reclamation and vast highway projects. But the introduction of smaller hydraulic equipment has brought the technique to golf courses, residences and commercial properties.

Choosing the right equipment is an important step before breaking a company into hydraulic mulching, but choosing the right mulch is just as important.

Many companies manufacture and market hydraulic mulches, but three companies concentrate on the landscape industry. Conwed Fibers and Weyerhaeuser produce wood mulches, while Cellin manufacturers a paper mulch product.

Weyerhaeuser's sales manager, Bill Grunow says that studies show that mulched plots have up to 80 percent more cover than seeded plots. Mulches protect seed against elements such as wind and rain, and insulate the seed by retaining soil moisture.

## Buying considerations

When choosing a mulch, one of the first things to look for is the product's content. Weyerhaeuser's Silva-Fiber mulch is made out of 100 percent virgin wood. Grunow says the plant in Tacoma, Wash. manufacturers mulch made from whole small Alder trees. The Minnesota plant produces mulch from Aspen wood.

"Wood species is an important



Hydraulic mulching helps establish a uniform stand of turf.

characteristic because some woods don't absorb water as readily," says Jacobsen. He wouldn't, however, reveal the type of wood used in Conwed's mulch, although it is 100 percent virgin wood.

Cellin's K hydraulic mulch is a wood cellulosic product made from recycled newspapers collected at paper drives or obtained through a broker. "We add three ingredients to make it a good product," says Cellin's Harold Smith. Smith would not name the ingredients.

The biggest question concerning ingredients is whether wood or paper is right for the job. Some highway jobs specify the use of virgin wood fiber mulches. But for companies which

have a choice, both products have advantages and disadvantages.

The biggest advantage of paper mulch is that it is less expensive than wood. "We don't think there's any advantage to raw wood," says Cellin's Al Turner. "The bottom line is that it (paper mulch) grows grass and is less expensive. We're not cutting trees down. What we're doing makes sense."

"On the ground, the paper can form a mache which hardens and tends to curl and ball up," Grunow says. "You tend not to get as even a coverage which results in uneven strands of grass."

The next step in choosing a mulch is to look at fiber length. "The number-one key is fiber length," Grunow says. "The fibers interlock with each other on the ground creating a micro-environment for the seed."

Fiber length is measured by running the product through a screen called a Clark Fiber Classifier. Only certain length fibers will be retained on the screen.

Weyerhaeuser specifies that a minimum of 30 percent of the fibers average .15 inches or longer with 50 percent or more retained on the screen. Conwed and Cellin both label their mulches "long fiber," but don't give a specific lengths.

The third point is whether or not the product contains a tackifier. Use of a hydraulic mulch with a tackifier depends on the size and slope of the area. All three companies manufacture products containing tackifier.

The products differ in slight ways, such as packaging, pricing (depending on regions of the country) and customer service.

"I don't think hydraulic mulching has yet to reach its full potential," Jacobsen says.

LM



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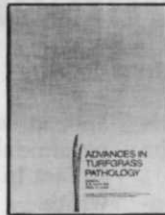
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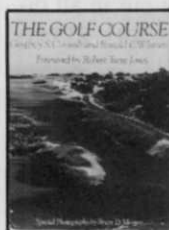
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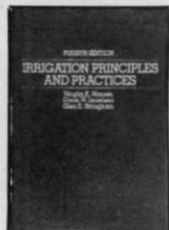
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## Hemlock—a versatile conifer

by Douglas Chapman, Dow Gardens

Hemlock is one of the most versatile native narrow-leaf evergreens for the landscapers' palette.

Hemlock is unique among the conifers in that it will grow in shade or in partial sun. It must be grown on cool, moist sites. It can be found growing in glacial rocky soil, fertile clay loam, or moist sandy soils. The optimal pH is from 4.0 to 6.5. This plant grows best on moist, yet, well-drained soils.

Hemlock is one of the most cold-tolerant plants, reported hardy to -76 degrees F. Hemlock should be transplanted balled and burlaped spring or fall.

Canadian hemlock is very shallow-rooted, thus intolerant to changes, frequently dying if plants around it are removed or the grade is changed. If undisturbed, it is a long-lived tree. Canadian hemlock, a fine-textured conifer, is most widely available in the trade. The needles, which last three to four years, are dark green with a silver-green on the under surface. The leaves are very sensitive to salt spray, resulting in defoliation

and, in severe cases, death. It has a pyramidal habit of growth, being 40 to 70 feet in height and 25 to 35 feet in width.

The branches are pendulous and very resistant to ice and/or snow damage. Hemlock can be used as a hedge or in natural plantings.

Canadian hemlock is not suited as a foundation plant. It is well suited for large area landscapes, golf courses, parks, or the home landscape. It is most effective in groups of three or more and not as a specimen.

Only a few clones are available in the trade, but one report notes a great deal of variation in Canadian hemlock which should lead to many new cultivar introductions.

The two cultivars available are Coles Prostrate and Sargentii.

Coles Prostrate hemlock is more correctly a ground cover, being six inches in height and three to six feet in width. It should be used when a landscape architect is looking for a shade-tolerant evergreen ground cover.

Weeping hemlock (*Sargentii*) is extremely useful in the home landscape as a specimen in protected locations. It will reach six to eight feet in height and 12 to 25 feet in width. The largest I have seen is on Long Island at Planting Fields Arboretum.

Carolina hemlock is native to the southeastern United States, Virginia to Georgia. It is not readily available in the trade, but I have seen it being grown at Weston Nurseries in Hopkinton, Mass. It is more dense, due to the fact that it holds needles one year longer. The habit is very graceful. Carolina hemlock reaches 40 to 60 feet in height and 20 feet in width.

Carolina hemlock is more difficult to transplant than Canadian hemlock, but one report suggests it grows more rapidly once established. We have it growing in Dow Gardens in central Michigan.

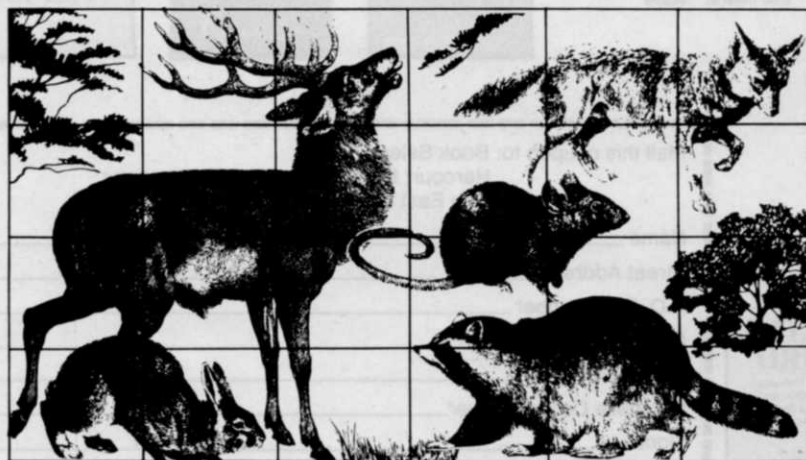
It is reported to grow better in urban landscapes than Canadian hemlock. It can be planted in the same landscape situations as mentioned above, and is especially well suited as a hedge plant. We are anxious to see it fruit; the cones are larger than Canadian hemlock, thus more effective.

Japanese hemlock is a small, compact tree, reaching only 20 to 25 feet in height. The short needles radiate out in all directions. They are light green underneath.

This is a tree that is difficult to find in the nursery trade, but it could be a unique addition to small home or courtyard landscapes. The largest plant I have seen growing is in Cambridge, Mass. at Mt. Auburn Cemetery. Japanese hemlock has the most dense appearance, holding onto the needles for eight to 10 years.

Hemlock is a genera that deserves a prominent place in the landscape. It has few disease problems unless weakened or predisposed. The most significant pest is mites which are not much of a problem if planted on a wet, cool site. It tolerates pruning well, thus is a good hedge.

Hemlock should be grown in groups for natural plantings and not as a specimen except for weeping Canadian hemlock. It grows well in the shade or on protected sites. Hemlock ranks high as a low maintenance, high quality landscape tree. Charles Sprague Sargent and Donald Wyman both rank Canadian and Carolina hemlock as the best of the narrow-leaf evergreens. **LM**



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# PROBLEM MANAGEMENT

by Balakrishna Rao, Ph.D.

## Controlling angleworms

**Problem:** How do you get rid of angleworms (earthworms) in bentgrass? When lead arsenate was legal it worked fairly well and one other chemical I tried didn't work at all. I hope you have a solution for killing angleworm without killing the bentgrass. (Wisconsin)

**Solution:** Angleworms (earthworms) are considered to be beneficial and generally no control is needed or recommended. If the population is very high, their castings, seen as mounds of soil on turf, may not be aesthetically pleasing. Earthworms can build up in large numbers in moist and soft soil rich in organic matter. Generally, their activity represents a good fertile soil and no chemical treatment is recommended.

Earthworms are hermaphroditic (all have both male and female reproductive organs), but not self-fertile. Because of these features, under moist and good soil conditions they can build up in large numbers. This may present a problem in many close-cut grasses like bentgrass in golf courses. Often raking will take care of the problem.

If the problem is very severe, application of diazinon twice at two-week intervals will provide some control. Check with your county cooperative extension agent about any state regulation concerning earthworm control. Read and follow label specifications for best results.

## Composting clippings

**Problem:** During the growing season, our mowing service generates a lot of grass clippings. We are thinking of composting it. How long should we wait before using the composted clippings in the garden or around landscape plants? (Michigan)

**Solution:** Follow normal procedures for composting and wait for six months to a year before using the composted clippings in the garden or around landscape plants. As a precautionary step, you can do a radish seedling bio-assay. Plant a few radish seeds in the composted clippings in the ground or in a container. If the seedling grows without any growth distortion, the composted clippings can be used for any landscape or gardening work.

## Managing moss

**Problem:** We are thinking of doing some no-till renovation using Roundup. The problem is that in a number of our clients' lawns there is a heavy growth of moss. Will the Roundup take care of moss problems? If not, what can be done to manage this? (New York)

**Solution:** During no-till renovation procedure, Roundup can be effectively used to manage most of the undesirable vegetation. Moss plants are not included in the Roundup label and a Monsanto representative indicated that Roundup may not be able to

take care of moss problems.

The first step in managing a moss problem is to identify the primary reasons why moss is growing in a particular location. Infestation of moss is associated with low fertility, poor drainage, too much shade, soil compaction, wet conditions, poor air circulation or a combination of these factors.

Some, but not all, cases of moss growth may be related to acid or alkaline soil conditions. To manage moss problems, identify the cause(s) and provide corrective measures. Ammonium sulfate (10 lbs./1000 sq.ft.) applied on actively growing moss plants has reportedly been effective. Reports indicate that ammonium sulfate can help the turf fill in as the moss thins.

Another material, copper sulfate (3 tbsp. in 5 gal. water/1000 sq.ft.) also can be used to manage moss problems. Make sure to wear protective clothing and gloves. Copper sulfate can stain and is difficult to remove from clothing.

## Cooling fertilizer burn

**Problem:** We are a liquid lawn care company. We have used urea in our program in the past and have had some burn problems. We would like to use some low-burn fertilizers. What can we use? Please make your comments about these sources and their performance in relation to urea. (Pennsylvania)

**Solution:** To deal with fertilizer burn, you could use low-burn nitrogen sources, such as Fluf (18-0-0), a suspension nitrogen source manufactured by W.A. Cleary Chemical Corp; Formolene (30-0-1.6) a liquid nitrogen source from Hawkeye Chemical Co.; or Nitroform (38-0-0) a ureaform fertilizer manufactured by Nor-Am Chemical Co.

Reported research indicates that Kentucky bluegrass treated with spray-applied urea results in better color than bluegrass treated with either Nitroform or Fluf during the spring growing season. However, this trend is reversed by late summer. This means that urea can be used successfully during spring. Then as the temperature increases and soil moisture decreases, incorporate the low-burn potential products.

During the heat of the summer, reduce the amount of urea in the program and replace with low-burn nitrogen. If possible, use only the low-burn potential products. Later in the season, as the temperature begins to decline, the amount of urea can be increased and low-burn potential materials can be reduced or eliminated.



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

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



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## City crews cut work time in half with grinder



The Promark root grinder saves crews time when removing trees.

Beautiful things, trees. But, they can sometimes create problems with city sidewalks.

"If trees aren't watered properly, the roots sometimes start coming up," says Danny Mendez, public works and street supervisor for the city of Fontana, Calif. "Here in Fontana, we get lots of complaints."

Fifteen years ago, city crews planted ash saplings in parkways and dividing strips between sidewalks and roadways in new housing developments. Today, the backlog of root-cutting jobs is enough to keep the department busy for weeks on end.

Ash trees do not drive their roots very deeply into the soil. Instead, the roots push outward seeking water at the surface and two to three inches below the surface. The exposed roots can eventually become a nuisance, creating hazardous conditions and liability problems, destroying concrete sidewalks, curbs, driveways, sewer and drainage lines.

According to city workers Herm Zander and Leo Bishop, the job of cutting the roots on one side of one tree used to take two men three to four hours each with axes, shovels, crowbars and picks. Then, 1½ years ago, director of maintenance services Guy Patterson ordered a Model 16SP

stump and root grinder from Promark Products West.

"It's real handy," claims Mendez. "It saves our crew a tremendous amount of time. We try to save as many trees as possible, but when we have to remove one it takes less than an hour. Sidewalk repairs only take a few minutes. I wish we'd've gotten the grinder a long time ago."

Mendez says that the grinder is

also very inexpensive to maintain. Blades which sell for approximately \$35 a set are replaced once a year.

Zander and Bishop cite the cutter wheel's location as a handy feature. It is out back where the operator can see it and visually guide its path without endangering himself, the tree or the machine.

"I don't know how we got along without that grinder," says Patterson. **LM**



Danny Mendez (right) gets some tips about the Promark grinder from one of the workers who uses it in Fontana, Calif.



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112	126	140	154	168	182	196	210	224	238	252	266	280	294	308	322	336
113	127	141	155	169	183	197	211	225	239	253	267	281	295	309	323	337
114	128	142	156	170	184	198	212	226	240	254	268	282	296	310	324	338

**LANDSCAPE  
MANAGEMENT**

AUGUST 1987

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 0045  Condominiums/apartments/housing developments/  
hotels/resorts  
 0050  Cemeteries/memorial gardens  
 0060  Military installations & prisons  
 0065  Airports  
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**B. CONTRACTORS/SERVICE COMPANIES/CONSULTANTS:**

- 0105  Landscape contractors (installation & maintenance)  
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(please specify) \_\_\_\_\_

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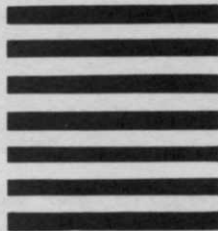
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Circle No. 122 on Reader Inquiry Card



## Irrigation products combine efficiency and durability

Toro's Irrigation Division has introduced new irrigation equipment designed to operate systems efficiently. The 570C-12P (pictured), the latest in Toro's 570C Fixed Spray Series, features the company's Conilip™ seal and cap configuration for improved seal and reduced flush action.

With the 570C-12P, the Conilip™ series includes three-, four-, six- and 12-inch pop-up models with 75 different nozzles.

Also, Toro has put a stainless steel sleeve around its 610 gear-driven rotary sprinkler.

The company has also introduced two Custom II series controllers available in either hydraulic or electric with a choice of eight or 12 stations.



They feature a seven-day watering cycle and up to 11 start times per day.

Circle No. 192 on Reader Inquiry Card

## Aquatic herbicide in gallon containers

Rodeo aquatic herbicide from Mon-

santo is now available in one-gallon containers. Users can order by telephone for direct delivery.

"This will be very convenient for those who have just a small problem with aquatic weeds in drainage ditches or small retaining ponds," says Monsanto's Sharon Gabel. "It will be especially helpful to owners of small recreational swimming and fishing lakes who are troubled with cattails which have taken over the shoreline."



Rodeo is a broad-spectrum aquatic herbicide that provides effective control of more than 160 emerged grasses, brush and broadleaf weeds.

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## Tree transplanter is completely self-contained


The tree transplanter from Mid-Dakota is completely self-contained, can be towed by anything and goes anywhere a garden tractor goes without damaging lawns or underground sprinkler systems.



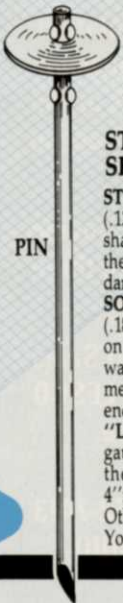
The size of the rootball can be set exactly for each trunk diameter through 2½ inches, making it useful for potted trees and shrubs. The towa-

continued on page 74

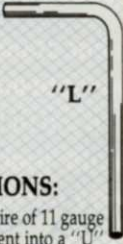
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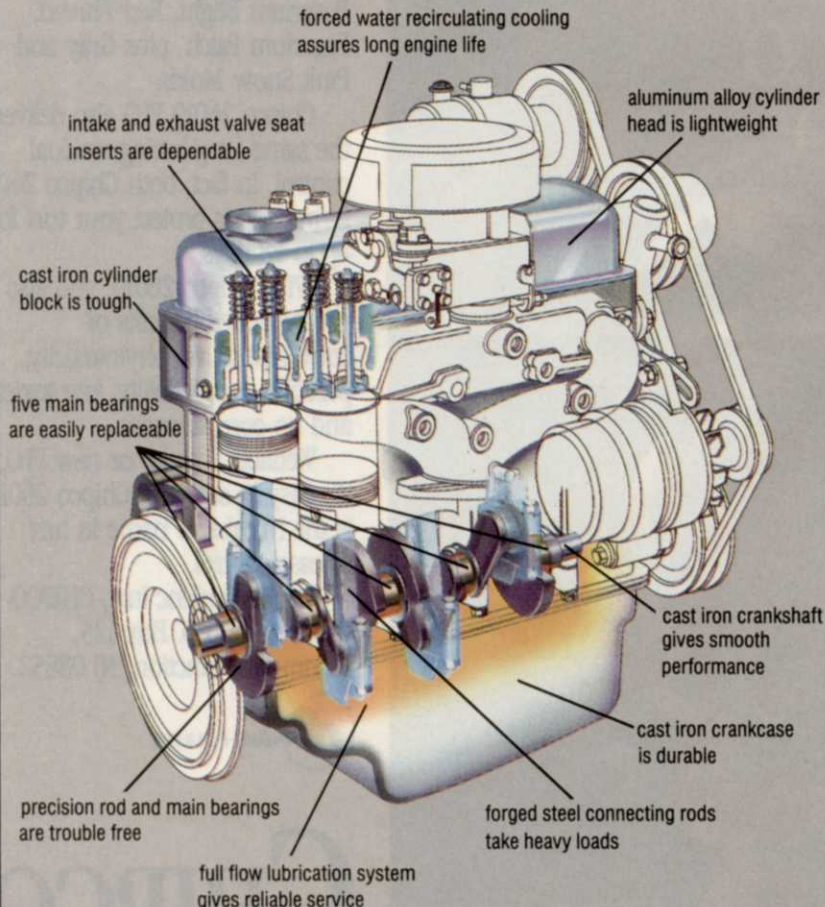
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R-11/14

## PRODUCTS from page 72

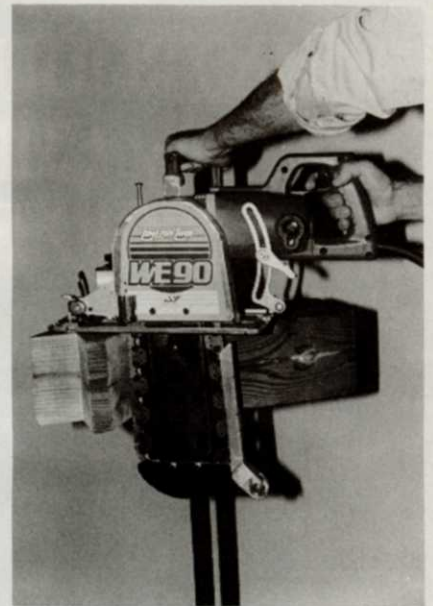
ble transplanter is \$4,500, the transplanter for mounting in a bucket or loader is \$1,500.

Circle No. 194 on Reader Inquiry Card

## Power saw introduced at Landscape Expo

The Linear Link, a portable power saw from Progressive Power Tools, was unveiled at the Landscape Exposition in Chicago, March 3-5.

The saw leaves a smooth cut on landscape timbers used for building planters, decks, railings and other structures. The saw can cut notches without overcutting, has an eight-inch cutting capacity and cuts angles to 45 degrees.



Safety features include a full upper blade guard, a non-removable tip guard and rear pivoting blade guard.

## Blue colorant marks path of spray application

Turf Mark, a blue color spray indicator, shows where spray is applied. The temporary colorant is a formulated concentrate that mixes easily with pesticides and fertilizers or other plant growth-regulating chemicals. Amount of colorant concentrate can be varied for more or less color intensity.

The colorant helps eliminate spray overlap, over-application, skips and drift. It can be used in spot spraying or broadcast application. The colorant comes in poly bottles with self-calibrating spouts, in one quart or one gallon sizes.

Circle No. 196 on Reader Inquiry Card

continued on page 76

Circle No. 146 on Reader Inquiry Card



# The Bare Facts

## SEED SHIELD VERSUS STRAW.



USCO Landscapes project, Richmond, VA—SEED SHIELD was tested by a professional landscaper against straw in covering grass seed.

Both areas were identically prepared, seeded and subjected to the same growing conditions including a 6 week drought.

But then, after 1 week of identical watering, the SEED SHIELD covered side (left) showed dramatic germination results compared to the straw covered side (right).



Betty Staples, Owner  
USCO Landscapes, Richmond, VA

### “SEED SHIELD cuts germination time in half.”

“I was skeptical about using SEED SHIELD at first,” admits Betty Staples, a professional Richmond, VA landscaper. “But after using it on several commercial and residential projects since September, I am sold on it.

“On the average, using SEED SHIELD along with proper soil preparation and watering, I’ve been getting over 90% germination

in 4-5 days for fescue. With a straw covering, it generally takes twice as long to get just 60% germination and considerably longer to get full germination.

“SEED SHIELD seems to hold just the right amounts

of heat and moisture. I was able to get excellent fescue germination in October and November despite extreme weather conditions including drought and drastic temperature changes. Plus only one daily watering was needed instead of the usual 3 required with straw.

“It also solved a number of other landscaping problems. I got fewer bare spots. SEED SHIELD virtually eliminated debris from the new grass. It cut down on wash caused by rain. And it kept the birds from eating the seeds.

“I’ve recommended it to homeowners and other landscapers as being very cost-effective in the long run for producing faster, healthier sod quality growth. Plus it can let you seed earlier and later in the season than straw.”

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Circle No. 104 on Reader Inquiry Card

## PRODUCTS from page 74

### Water absorber handles 4,000 gal./hr.

The Super Sopper has been used in Australia for more than eight years. It is now available in the United States. The Sopper, available in four sizes, can handle as much as 4,000 gallons per hour (the Whale) for heavy duty



jobs such as fairways or outfields, down to smaller jobs such as greens or tennis courts.

The Sopper works on grass, sand, concrete, asphalt and other surfaces, absorbing one inch of water on each pass. Conversely, it can also be used to wet a surface after an event to help repair damage.

Circle No. 197 on Reader Inquiry Card

### Wheel loader performs with power, durability

The Coyote C8 fully articulated loader goes where skid loaders go, handling buckets from 0.75 cubic yards to 1.25 cubic yards through means of a Z-bar linkage with one double-acting lift and one double-acting bucket cylinder.

It is powered by a Duetz four-cycle, two-cylinder air-cooled diesel engine generating 38 hp. Four-wheel drive



can be activated by the operator from the cab. The loaders feature a three-year/3,000-hour full drive train warranty.

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Even more  
It's kid proof



## Denser, darker green Manhattan II takes the bruises *for* your athlete

What goes up must come down . . . and that goes double for athletes' knees and elbows.

Improved Manhattan II perennial ryegrass has a built-in cushion developed through genetic improvement. The greater tiller density of Manhattan II takes the punishment athletes dish out, then springs back to retain its great-



looking appearance. All that toughness . . . with improved mowability to boot!

Manhattan II also provides a darker green color than the old standard Manhattan; improved disease resistance, drought and shade tolerance as well as fertilizer savings.

Manhattan II was developed to save on maintenance costs . . . but the *real* saving is on knees and elbows!

"Fall on the leader"  
**Manhattan II**  
TURF-TYPE PERENNIAL RYEGRASS

Qualified turf associations can earn cash for turf research by saving Manhattan II blue tags. Contact your dealer for details.



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BOX NUMBER REPLIES: Mail box number replies to: LANDSCAPE MANAGEMENT, Classified Ad Department, 1 East First St., Duluth, MN 55802. Please include box number in address.

## BUSINESS OPPORTUNITIES

Outstanding business opportunity available! Very, very fast growing tree, shrub and lawn care company on Long Island for sale by one of New York's leaders in the greens industry. Serving prestigious areas of Suffolk Counties North and South shore. Fully automated working environment. Three truck fleet completely equipped. Terms negotiable. Monday through Friday 9:00 - 5:00. 516-360-3361. 8/87

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

Tired of working 12 hours a day for someone else's bottom line? Be your own boss! Earn your own profits! For as little as \$6800 down you can join the LawnCare professionals at ServiceMaster. Call (312) 964-1300 ext. 2242 to receive information on how to get started. 12/87

## HELP WANTED

Landscape Maintenance Salesperson position available with Yardmaster, Inc. in Cleveland, Ohio. Excellent compensation plan and benefits. Join Ohio's largest design/build and maintenance firm. Send resume or call **YARDMASTER, INC., 1447 N. RIDGE RD., PAINESVILLE, OH 44077, 216-357-8400.** 10/87

**ESTIMATOR SALESPERSON:** A diversified, growing, suburban Cleveland landscape firm has an opening for a landscape Estimator/Salesperson for commercial projects. Applicants must have experience in commercial landscape contracting and a college degree in a related field, ability to deal with landscape architects and general contractors needed. We are looking for a highly motivated individual with a proven record to help us grow. If you are qualified for this career opportunity, please send resume, work and salary history to Chagrin Valley Landscaping, P.O. Box 391002, Solon, OH 44139. 8/87

**ARBORISTS: ASSISTANT FOREMAN AND FOREMAN** positions available. Top pay and benefits including medical plan, paid sick and vacation time, education and year round work. You should be experienced in shade tree and ornamental pruning, landscape planting and spray operations. An excellent chance to work for a top quality company in suburban Boston. **CALL LUEDERS TREE AND LANDSCAPE @ 617-359-4855 OR 617-444-0994.** 8/87

**LANDSCAPE MAINTENANCE AND CONSTRUCTION FOREMEN:** Suburban Cleveland firm is seeking experienced individuals who can work together with other people. Must be hard working, organized and capable of directing a project from beginning to end. Salary commensurate with experience. Send resume to: P.O. Box 391002, Solon, OH 44139. 8/87

**LANDSCAPE MAINTENANCE SUPERVISOR:** Expanding landscape management firm seeking individual with supervisory ability and a minimum of two years experience in maintenance and/or installation. An agricultural related background or degree would be beneficial. Send resume with salary requirements to: Maintain Inc., 16008 Boss Gaston, Richmond, TX 77469, Attn: Branch Manager. 8/87

**Sales Rep.** North Jersey tree expert co. seeks responsible, experienced, sales oriented person. Excellent compensation for right individual. Send resume & salary history to LM Box 423. 8/87

**NEED MANAGERS?** Need qualified managers to run new or existing operations? Locate key personnel quickly. Call Beecher Smith, Green Industry Resources Corporation (301)253-5787.

## CITY ARBORIST

The City of Urbana, Illinois, (pop. 38,000), home of the University of Illinois, and a TREE CITY U.S.A. for 11 consecutive years, seeks to fill an opening for City Arborist. The person who fills this position will be responsible for the administration of the City's tree planting and maintenance program; supervision of divisional staff; administration of the Arbor Division budget, including special funds; and administration of the City's tree ordinance and standards and special projects.

Interested candidates should hold a bachelor's degree with emphasis in forestry, ornamental horticulture, or appropriate biological science and three (3) years of work experience in arbor management.

To apply, please submit resume and introductory letter, salary history and expectations to: Ronald Gremore, Personnel Manager, City of Urbana, 400 South Vine Street, Urbana, Illinois 61801, before September 11, 1987.

(E.O.E.)

**LANDSCAPE MAINTENANCE FOREMEN NEEDED:** Expanding commercial landscape maintenance firm servicing Dallas/Ft. Worth areas. Knowledge of industry a must. Send resume to: **GROUND TECH INC., 2036 Bedford Road, Bedford, Texas 76021.** 9/87

**ASSISTANT TO PRESIDENT:** Outstanding opportunity to join and grow with Westchester's fastest growing Tree Care Company. All benefits. Send resume to Ms. Michele Gerards, Sav-A-Tree of Westchester, Inc., P.O. Box 527, Armonk, NY 10504-0527. 8/87

**PROJECT MANAGER:** Excellent opportunity for career and goal oriented individual to work with a commercial landscape firm in Atlanta, Georgia. Must be experienced in all aspects of landscape construction and willing to assume total responsibility. Good salary, benefits and incentive program. Scapes, Inc. 404-956-7500. 8/87

**PO•TEN•TIAL - THAT CAN, BUT HAS NOT YET, COME INTO BEING; POSSIBLE.** Established and expanding landscape Management Firm in D/FW area is looking for Account Representatives that are self-motivated & energetic individuals. Training, benefits, salary plus commission. Send resume/work history to John Delin, 2036 Bedford Road, Bedford, Texas 76021. 8/87

**ARBORIST SALES POSITION:** Outstanding opportunity to join and grow with Westchester's fastest growing Tree Care Company. All benefits. Send resume to Ms. Michele Gerards, Sav-A-Tree of Westchester, Inc., P.O. Box 527, Armonk, NY 10504-0527. 8/87

Gibbs Landscape Company - Landscape and grounds maintenance. High caliber people needed to assist award winning company doing quality work in Atlanta area. Must have good driving record, and transportation. Offer good pay, and benefits. If you are dependable and industrious, send resume: Attn: Mike Sherman, 4111 Burge Road, Smyrna, GA 30080. (404)432-7761. 9/87

**TURF AND ORNAMENTAL APPLICATOR MANAGER** - Located in the beautiful, horse country of Lexington, KY. The nation's 2nd oldest landscape nursery is looking to expand its pesticide/lawn/care department. Applicants must have experience in all phases of chemical application, record keeping, sales, personnel, customer relations, and department management. We are looking for a self-motivated person to fill this career position. Compensation includes a full set of benefits plus top pay. If qualified, please send resume and salary history to: Hillenmeyer Nurseries, Inc., 2370 Sandersville Road, Lexington, KY 40511, ATTN: Lee Gifford or call 606-255-1091. 8/87

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

## HELP WANTED

### Assistant Managers & Foremen

Excellent growth opportunity with Connecticut's largest landscaping firm. Complete Interior and Exterior Construction and Maintenance Departments. Candidates should have an "A.S." or "B.S." in Horticulture or equivalent in experience also two years experience supervising and motivating people. Excellent company benefits. Salary commensurate with experience. Send resume with education, experience, and salary history in confidence to:



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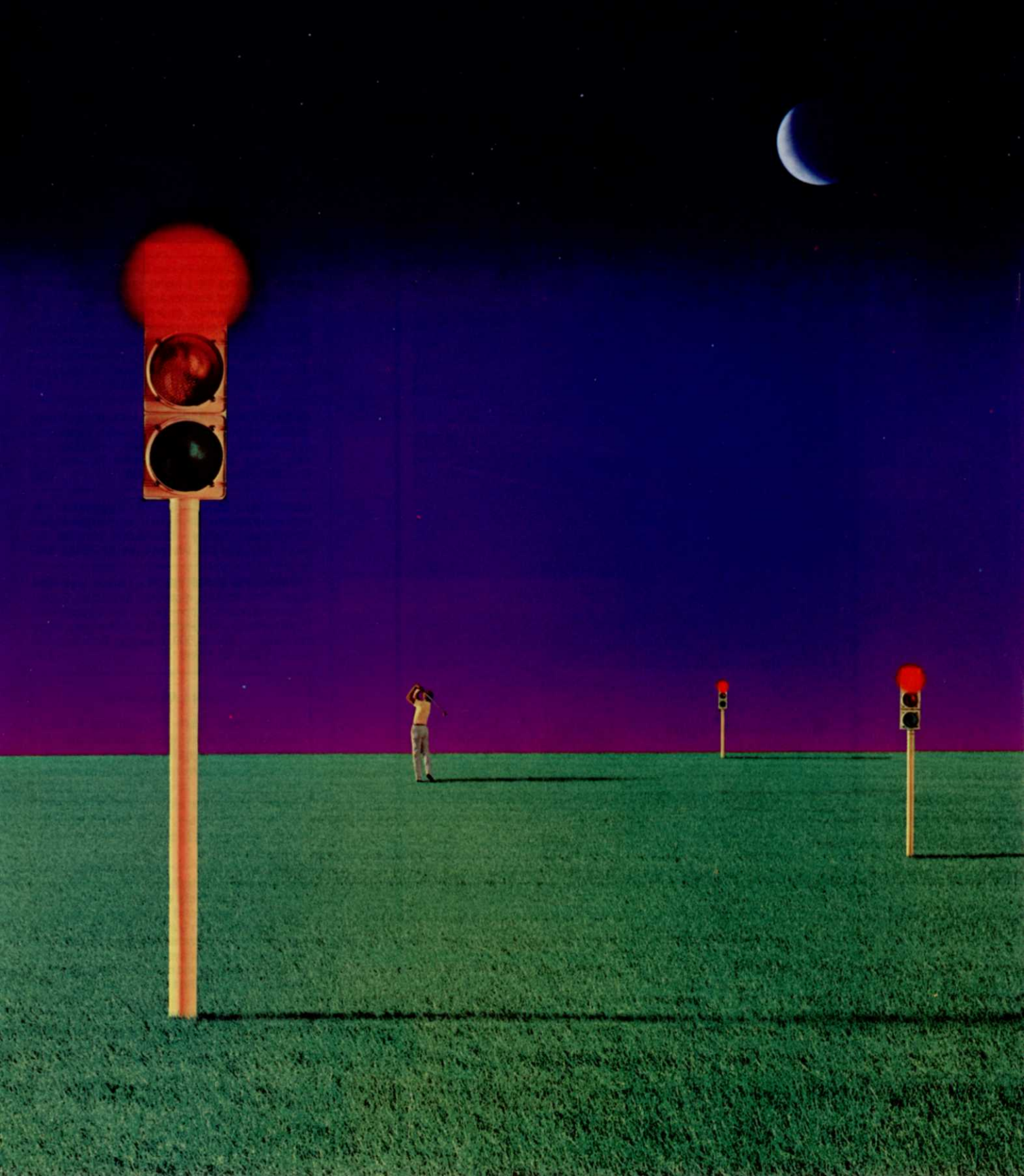
**MILFORD LANDSCAPING & MAINTENANCE, INC.**

P.O. BOX 2-186  
MILFORD, CT 06460  
203-878-8748

Fleet Superintendent/Equipment Coordinator to perform maintenance on diesel/gas equipment 80 h.p. to 1 h.p. and coordinate the use of equipment throughout the state of Florida. Please send resume to Quandt-Ayer Enterprises, P.O. Box 271880, Tampa, FL 33688. 8/87

**SEND YOUR RESUME IMMEDIATELY!** We have open positions for Lawn Care Branch Managers, Nursery Managers, Horticultural, and Landscape/Const. Managers. We computer file your resume and contact you when jobs open in your field or area you desire. Confidential placement from Green Industry Resources Corporation, 25230 Conrad Ct., Damascus, MD 20872, (301)253-5787. 8/87





Stops leaf spot for less.

Dyrene 4.

It's the economical new formulation of a proven performer. So now you can keep leaf spot under control. Without your budget getting out of control. DYRENE 4 flowable turf fungicide. The stopper. Mobay Corporation, Specialty Products Group, Box 4913, Kansas City, Mo. 64120



DYRENE is a Reg. TM of Mobay Corporation. 6-2254

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Top dressing levels existing turf on athletic fields while stimulating growth and improving soil conditions. Repetitive top dressing fills in the low spots and also promotes the decomposition of thatch.



■ Top dress 18 golf greens in under 6 hours

■ Top dress an athletic field in under 2 hours

■ 18.3 cubic feet hopper capacity

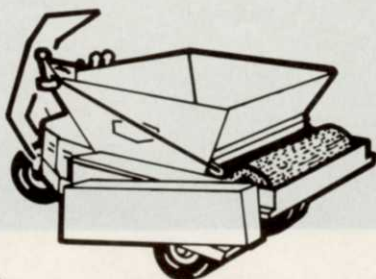
■ Top dress at up to 8 miles/hour



■ Spreading width of 60"

■ Ground driven no engine to maintain

TURFCO also manufactures self-propelled and truckster-mounted METE-R-MATIC TOP DRESSERS



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**TURFCO**

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### HELP WANTED

**Lawn Care and Lawn Maintenance Assistant Manager:** Leading Horticultural Company since 1929 is seeking qualified applicant who is highly motivated, management oriented and strong in customer sales and service. Excellent growth opportunity and benefits. Salary commensurates with experience and performance. Send resume to: McNaughton's Nurseries, Inc., 351 Kresson Road, Cherry Hill, NJ 08034. 10/87

Established Central Florida landscape contractor has an opening for a highly qualified operations manager for its maintenance division. Ability to schedule, organize, and manage people in a rapidly growing organization. Heavy field experience, and a commitment to quality work required. Opportunity for an aggressive person to be a key member of a top notch team. Excellent salary and benefits. Call: Mr. Singh, 305-831-8101. 8/87

**NURSERY MANAGER** - Metro-Detroit landscape contracting firm. Horticultural degree, experience in purchasing, inventory control, wholesale nursery. Salary - \$25-45,000, benefits. Resume: P.O. Box 314, Walled Lake, MI 48088. 8/87

**LANDSCAPE DESIGN/SALES** - Aggressive, self-motivated person. Minimum 2 years experience in design/sales. Salary - \$25-45,000, benefits. Resume: P.O. Box 314, Walled Lake, MI 48088. 8/87

**LANDSCAPE SUPERVISOR** - Detroit area landscape firm, seeking motivated individual. Experience in residential, commercial landscape plans. Plant material and construction techniques. Benefits, salary - \$25-35,000. Resume: P.O. Box 314, Walled Lake, MI 48088. 8/87

### ORKIN LAWN CARE

Orkin Lawn Care is opening 4 new branch locations this summer and is **NOW** taking applications for experienced Lawn Care Managers and Assistant Managers. Areas include Florida, Texas, North Carolina. Send resume to Gordon Crenshaw, 2170 Piedmont Rd. N.E., Atlanta, Georgia 30324 or call 404-888-2771.

Landscape Architects/Supervisors (project foremen) to join a nationally acclaimed firm looking to expand into its second generation Long Island area supports a high budget landscape industry. Year round employment, company benefits and continuing education available. Experienced and aggressive people send resume to: **GOLDBERG & RODLER, INC.**, 216 East Main Street, Huntington, New York 11743. 10/87

**CAREER OPPORTUNITIES:** ChemLawn is now accepting applications for the positions of Lawn Specialist in our expanding Florida Markets. Join the Nation's Leader in Lawn Care. Send resume to LM Box 422. TF

**HELP WANTED:** Landscape, turf and spray foremen, nurserymen and pruners. Experience and/or education necessary to work for our dynamic, quality oriented, large, 40 year established company in the Hamptons on Long Island. Professional wages and benefits, year round, full time positions. Contact: Whitmore-Worsley Inc., P.O. Box 10, Amagansett, NY 11930. (516)267-3756. 9/87

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





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You're looking at a picture, not of a place, but of an idea: ORTHENE® 75 S and why it means so much to professional gardeners, nurserymen, arborists and golf course superintendents.

ORTHENE offers blanket protection against an amazing variety of insect pests. It's cleared for use on a long list of trees and plants, from orchids to roses and ponderosa pine. ORTHENE now has a federal label for use against mole crickets in turf—the main enemy of professionals' healthy greens and fairways.

By using ORTHENE, you kill pests like tent caterpil-

lars, whiteflies, Japanese beetles and thrips on contact. Plus it provides lasting residual action against other insects from aphids to scale crawlers to sod webworms. It's a great way to make the whole job of protecting flowers, trees and turf simpler, and more effective.

If you're a professional in the plant care industry, ORTHENE can actually make it easier to do a better job of protecting plants. You ought to know more about it. To find out, send in this coupon.

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Compare Fylking's competitive price and advantages! Fylking forms a thick, lush turf that has improved disease and drought resistance. Fylking greens up earlier, stays green longer; can be cut as low as 3/4 inch—even 1/2 inch. Fylking has been proven over many years of international turf testing.

Ask your seed distributor for Fylking.

**FYLKING**  
**KENTUCKY BLUEGRASS**

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Another fine, quality controlled  
 product of Jacklin Seed Company

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**LANDSCAPE MAINTENANCE SUPERINTENDENTS AND FOREMEN:** Excellent opportunities for hard working, experienced individuals to work with an expanding Southern California commercial maintenance firm. Ability to plan, organize and supervise essential. Positions available in Los Angeles, Orange and San Diego Counties. Excellent salary and benefits. Send resume to or call: **PACIFIC GREEN CARE**, 1065 No. Batavia, Orange, CA 92667, 714-633-2404. 9/87

**GROUNDS SERVICE SUPERINTENDENT** up to \$2,901 approx. monthly (plus an extensive benefits package). San Bernardino County is recruiting for a Grounds Services Superintendent who will be responsible for directing, planning, designing and supervising the landscaping and maintenance of grounds and gardens adjacent to County facilities. One year of experience in managing and supervising a large landscaping and maintenance operation in a governmental, industrial or business environment is required. In addition, 24 semester (36 quarter) units of completed college level coursework in landscape, design and/or horticulture is also required. San Bernardino County is located in sunny Southern California approximately 60 miles southeast of Los Angeles. Qualified applicants should apply by August 28, 1987 at San Bernardino County Personnel Office, 157 West 5th Street. San Bernardino, CA 92415 (714/387-5591/8304). 8/87

**Parkway's Maintenance Supervisor:** the City of New Orleans — Parkway and Park Commission is seeking a professional with strong management skills to head a grounds maintenance division. This position requires highly responsible technical, administrative, and supervisory work in directing and supervising employees engaged in the maintenance of parks and medians. Degree in horticulture, park management, or closely related field plus one year of supervisory experience required. Starting salary is \$1,791.00 monthly with excellent benefits. Send resume to New Orleans Parkway and Park Commission, 2829 Gentilly Blvd.; New Orleans, LA 70122. 8/87

**FOR SALE**

**BROUWER SOD HARVESTER** - 1974 - 18" Rolling unit with steel mat & cross conveyor on Ford 3000 diesel - 4758 hours - \$13,500.00. Shore Tractor, New Jersey - 201-462-8822. 8/87

**STAINLESS STEEL TANK BODIES** available. 4 pots each, 800 gallon and 1,000 gallon with dry storage to mount on your chassis. \$2,000-\$3,000 or offer. Call Jim Doll (301) 840-5500. 8/87

**SPRAY TRUCK** - 3 Chev. 1981 C-60D Chasis, auto trans, stainless steel tank body, 1200 gallon (4 pot) with 4 reels, 2 - 12 hp Kohler pony engines, 1 - 9200 Hypro, 1 - D-10 Hydro Cell with dry storage capability and 2 Chev. 1983 C-70D, auto trans. with body and equipment stated above. As is \$14,500. or offer. Call Jim Doll (301) 840-5500. 8/87

(2) 1984 GMC 6,500 series - 22 K miles, 35 GPM hydro pump, 23 h.p. Kohler engine, 750 gallon tank, reel, hose, etc. Truck - \$9,995. Truck with sprayer - \$14,995. (1) 1982 factory built (DO6O1000) Bean, 60 GPM, 1,000 gallon tank, 65 h.p., Wisconsin engine, reel, hose, etc. Replacement costs new. \$22,070. Steal it at \$9,995. Ask for Paul, 516-582-8000. 8/87

**Vermeer 630 Stump Grinder.** Excellent condition and well maintained. Area Code (717) 898-8591 or 898-7443 After 5 p.m. 9/87

**JACOBSEN MOWER AND TRACTOR** - 1982 5 Gang Ram Lift Hydraulic Powered Mower and G-20 Diesel Powered Turf Tractor. Less than 150 hours operating time. 214-692-3303, Mr. Sims, \$18,000. 8/87





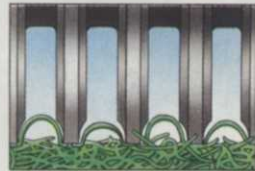
# The proof is in the putting.

The Greens King® IV with the revolutionary new Turf Groomer™ greens conditioner has no equal for producing faster, truer greens, *without* lowering height of cut.

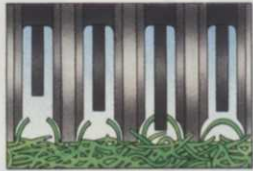
This unique, patented greens care system, a Jacobsen exclusive, concentrates on troublesome thatch and horizontal runners that can slow down putting, or even throw off putting accuracy.

The front roller "puckers up" horizontal runners and plant leaves, readying them for clipping.

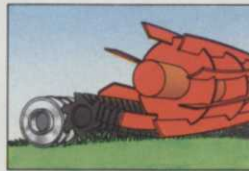
Then, the powered knife blades



Exclusive roller design features bevelled edges to "pucker-up" horizontal runners.



The knife blades rotate through slots in the front rollers, slicing horizontal runners before they lie down.



The horizontal reel follows closely behind to clip grass while it's standing straight, for faster, truer greens without lowering height of cut.

rotate *through* the slots in the front roller, cutting horizontal runners and removing thatch that can choke a green to death.

The reel follows closely behind, neatly cutting the grass while it's still standing straight and true.

The result: Faster, truer putting and healthier, hardier greens, ready for play. And, you get all this

without reducing the height of cut.

So, contact your Jacobsen Distributor to arrange a free demonstration. And, put this revolutionary new greens care system to the test on your own proving ground.

Finance plans available. Jacobsen Division of Textron Inc., Racine, WI 53403. Telex: 264428.

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**JACOBSEN**  
**TEXTRON**

Jacobsen Division of Textron Inc.



## FOR SALE

**STAINLESS STEEL TANK BODY** - 1200 gallon (4 pot), 4 reels, 2-12 hp Kohler pony engines, 1-9200 Hypro, 1-D-10 Hydro Cell with dry storage ready to mount on your truck. As is \$8,500 or offer. Call Jim Doll (301) 840-5500 8/87

Spray truck - 1978 Ford F600, excellent condition only 26,000 miles. 2 year old Meyers pump powered by 8 h.p. Briggs and Stratton engine, all new tires. (319)355-0153. 8/87

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**FOR SALE:** 1980 Toro Parkmaster HTN, 7 gang, 7 reel, 7 blade and a 1980 FMC D020 300 Gal. Sprayer. For more information call 305-225-1200, FL. 8/87

**FOR SALE** - Pest Control Company in fast growing Central Florida. Accounts in most exclusive neighborhoods for both inside and outside pest control, lawn fertilization and chemical pest control. Steady growth over last six years. Anticipated annual sales 1987 - \$100,000.00. Certified Operator available for transition period. Call or write McDaniel Pest Control, Attn: M. McDaniel, 551 Fir Court, Altamonte Springs, FL 32714 (305) 293-4929. 8/87

**TREE FERTILIZATION GUN** tested on over a million square feet of trees and shrubs all over the U.S. Good to 500 psi, repairable, non-corrosive. Buy direct from manufacturer, \$106.00 (shipping included). Arbor-Nomics, Inc., 585 Langford Lane, Norcross, GA 30071. (404) 447-6037. TF

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## SELECTIVE CONTROL Of Weeds, Brush And Weed Trees!



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Spot treatment cuts labor, materials. Automatic — Adjustable — Accurate.



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(612) 926-9711 • Telex 272636

**FOR SALE:** Large Southern California tree maintenance corporation geared toward municipal and governmental contracting. Forty person employee base with over \$750,000 in equipment. Three million gross in 1986 with steady growth pattern. Year around work with over 1.5 Million currently in contract backlog. Owner will run for one year. Terms and price negotiable. Serious inquiries only. Write to LM Box 428. 8/87

**SPRAY TRUCK:** 1984 International. With 1000/250 gal. tanks, Meyers pump, 2 Hannay reels, each with 400 ft. hose, very well maintained, professionally serviced, excellent condition. Has bedrails, spreader brackets, hand-sprayer holders, new paint. Call 203-372-3511, Tony or Bob. 8/87

**FOR SALE:** Hydro Ax, Model 520, Brush Cutters. Serial # 331 - 1976 - \$35,000; # 314 - 1975 - \$35,000; # 162 - 1974 - \$35,000. Engines rebuilt, good cutter heads, good tires. W. A. Kendall and Co., Inc., R/W Clearing Contractors, Lawrenceville, Georgia, (404) 963-6017. 8/87

**ENCLOSED CUSTOM LANDSCAPING TRAILERS.** Protect your investment from exposure and theft. Choice of colors, delivery available. **NORTHWEST TRAILERS**, Palatine, IL 800-522-6208 or 312-577-6208. 8/87

**ZOYSIA MEYERS Z-52 SOD OR SPRIGS. EXCELLENT QUALITY DELIVERED ANYWHERE AT REASONABLE PRICES. ALSO ROW PLANTING AVAILABLE. DOUBLE SPRINGS GRASS FARM, SEARCY, AR. (501) 729-5691. TF**

**BROUWER HARVESTER OWNERS! ELECTRIC DEPTH CONTROL.** Save time and money with improved quality control. Make depth-of-cut adjustments, on the move, with one button finger tip control. Allows you to cut longer rows through varying soil conditions. Save sod you would normally throw away. \$895. 30-day satisfaction guarantee and full-year warranty. Write or call Shattuck Turf Equipment, 1872 N.W. 82nd, Des Moines, IA 50322, (515) 278-5255. Patented. 10/87

**BROUWER SOD HARVESTER** - 1981 - 18" Rolling unit with steel mat & cross conveyor on Ford 3600 diesel - 1887 hours - \$20,500.00-Mint-Shore Tractor, New Jersey - 201-462-8822. 8/87

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**MODEL 12.** Proven daily for over 15 years on material up to 7" in diameter. With patented safety throwout device for operator control. One-half the price of engine-powered units.

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Circle No. 134 on Reader Inquiry Card

84 LANDSCAPE MANAGEMENT/AUGUST 1987

## National 76" Heavy Duty Triplex Reel Mower



- **High Quality of Cut** with National's 6 bladed reels
- **Dependability/Durability** with National's rugged design
- **Affordability** with National's price

### Features

- 11 hp I/C Engine
- 6 mph transport speed
- heavy duty rollers
- long life bed knives



**NATIONAL MOWER COMPANY**  
SINCE 1919 700 Raymond Avenue  
St. Paul, Minnesota 55114  
(612) 646-4079

WRITE OR CALL TODAY!

Circle No. 131 on Reader Inquiry Card



# To find a grass tougher than our new Aspen Kentucky bluegrass, you'd have to go undercover.



When searching for the ultimate turf, the grass to keep an eye on is Aspen, the elite new Kentucky bluegrass from Northrup King.

With qualities such as superior disease resistance, excellent color and texture, winterhardiness, heat tolerance, and wide adaptability, we think Aspen is not only the toughest, but the best bluegrass variety around.

Anything better would be downright unnatural.

You'll find Aspen only in Northrup King's Medalist Turf Mixtures. To uncover more information, contact Northrup King, P.O. Box 959, Minneapolis, Minnesota 55440.

Aspen / 



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**BOWIE HYDRO-MULCHERS AND STRAW BLOWERS**, New and used. Landscape Supply, Ltd., P.O. Box 22092, Greensboro, NC 27420. (919) 292-2922. 9/87

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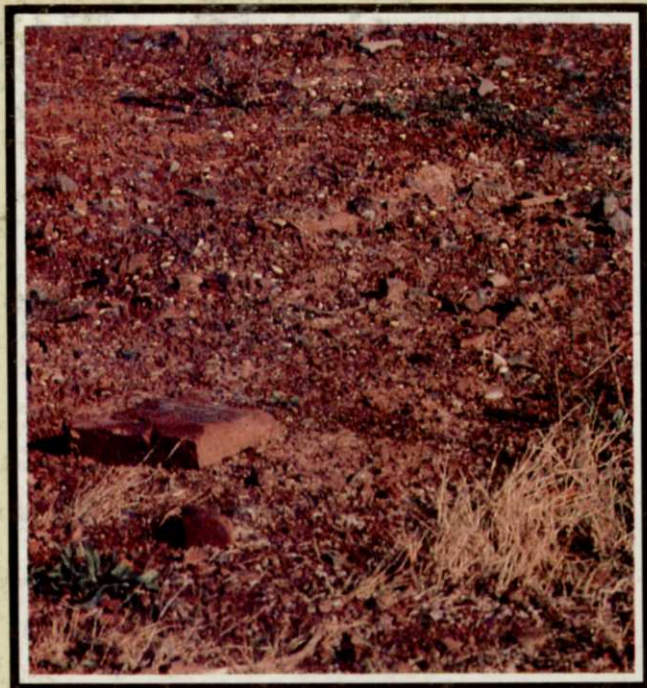


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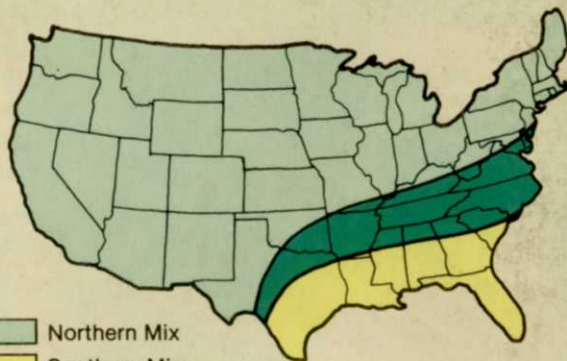
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