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The Magazine of Landscape and Golf Course Management Since 1962

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## 1986 seed crop gets mixed reviews

■ The seed harvest is progressing with alacrity in the Willamette Valley region of western Oregon, where 60 percent of the world's grass seed is grown, and also in western Washington, and northern Idaho. The bottom line on seed availability for late 1986 and early 1987: it's a guessing game until the crop is harvested and cleaned. After harvests are completed this month, seed availability (and price) should be more clear.

Here's a smattering of opinions from seed people about this year's crop:

**Harry Stalford, International Seed:** "The crop looks pretty good. If we get good weather the next three weeks (the last week of June and first two of July) we'll be in good shape."

**Bill Rose, Turf-Seed:** "The ryes are off in production due to a dry spring, perhaps 20 percent off. The tall fescues weren't hurt as bad, maybe 10 percent off. Bluegrass look like a good crop. The bentgrass looks excellent, as good as I've ever seen them. The fine fescues are drastically off, maybe 40 percent."

**Mike McCarthy, E.F. Burlingham & Sons:** "The fine fescues may be a short crop, the bluegrasses may be short, the ryes are yet to be seen, and the tall fescues look moderately good though some say it may be a little short."

**Doyle Jacklin, Jacklin Seed** (the company's seed is grown in Idaho, Oregon, and Washington): "The Kentucky blue proprietaries look good on irrigated land. The common Kentucky blue looks below normal because we've had some hot days south of here (Post Falls, Idaho). The perennial ryegrasses in the Willamette Valley look excellent. Fine fescues look poor."

**Jerry Pepin, Pickseed West:** "We are fairly encouraged by the crop. The tall fescues look good—demand keeps going up. We should have at least an average crop of perennial rye. Overall, I think yields will be average, maybe better."

Pepin and Pickseed West have developed Bronco Kentucky bluegrass, for mixing with the turf type tall fescues. Bronco should be available by early September.

## Report says pesticide market flat

■ The size of the \$5 billion agricultural chemical market should remain constant through the end of the decade, according to "The U.S. Pesticide Industry in Transition," a news analysis prepared by Frost & Sullivan of New York.

The 273-page report notes virtually all planters who might use agricultural chemicals are already using them. Therefore, an increase in acreage would be necessary for increased usage. The report says there could be a reduction in acreage because of foreign demand reductions or supply increases, major breakthroughs in agricultural productivity, and further declines in American consumption of meat, which is a relatively expensive food in terms of planted acreage support required.

For more information, contact Frost & Sullivan Inc., 106 Fulton St., New York, NY 10038. (212) 233-1080.

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## LAWN CARE

### Lawn care media scare: the industry strikes back

In March, the magazine *Home Mechanix* ran an article entitled "The Lawn Care Scare," focusing on the problems with chemical lawn care services. The article raised a question of accuracy among lawn care professionals, who responded with their side of the issue.

For example, Bob Styduhar, environmental counsel for ChemLawn Services Corp. in Columbus, Ohio, wrote this: "The article 'The Lawn Care Scare' by Sherry Romeo is inaccurate in both tone and content. It specifically criticizes ChemLawn for not requiring its employees to wear protective clothing while spraying lawns. Such equipment is appropriate and required by law only when handling certain products in concentrated form but not for the dilute, water-based solutions used in spraying lawns..."

"We also take issue with the statement in your article regarding the ap-

propriate re-entry period after a lawn has been sprayed. Re-entry periods for products appear on product labels. A few products used by ChemLawn carry a label recommendation to keep off the lawn until the dilute material dries. It is our experience that materials dry within 30 minutes to two hours after application, depending upon temperature and humidity..."

Jim Brooks, executive vice president of the Professional Lawn Care Association of America, wrote this: "Why attack professional lawn care services when we're among the leaders in environmental protection? Members strongly advocate safety, adherence to manufacturer's recommendations, and observance of state and U.S. Environmental Protection Agency regulations. Why say there are no controls? Professionals are so well-trained and closely regulated that we are the ideal way for home-



The March "Home Mechanix" cover.

owners to avoid problems...

"The record shows that through years of careful service, PLCAA members and other lawn care professionals have earned the trust of approximately 8 million residential customers, and about 1.5 million more join every year for the service. Why did you spotlight the risks without saying professionals recognize the risks and weigh those risks realistically? Authoritative health and regulatory officials say there's no threat to humans, pets or the environment from the general use of chemicals that professionals apply to lawns in diluted amounts. After all, these are the same chemicals homeowners are allowed to buy and apply themselves without supervision..."

"Finally, why did you advise readers to learn more about lawn chemicals mainly from activist groups? You could have referred them to their state university extension service, their state pesticide regulatory agency, the federal EPA in Washington D.C., or their regional EPA office and the PLCAA."

Barry Eldridge of Spring Valley, N.Y. wrote: "...Some of the information presented was irrelevant and, in one instance, redundant. Neither Abate nor Vapona (or DDVP) is a lawn care chemical. With respect to the relationship of 2,4-D to Agent Orange, I offer this analogy. Two products that share a common ingredient do not necessarily share the same properties: sodium is a component of table salt and of the pesticide sodium arsenate. Finally, on contamination of ground water by nitrates, the author failed to link the problem to the application of fertilizer rather than to pesticides."



Dr. Bruce Clark of Rutgers University (left center, with glasses) explains coating seeds with fungicide to turf managers at Lofts Field Day.

## TURFSEED

### Agronomist suggests using coated seeds in hot weather

Turfseeds coated with a fungicide will generally not contract pythium blight, even if planted during the hottest part of the year, according to Dr. Bruce Clarke of Rutgers University.

"When establishing seed in the summer, a fungicide treatment on the seed at a very low rate will help prevent damping off in the seed stage and will prevent pythium after the seed

emerges," Clarke said at the 10th annual Lofts Field Day this summer.

Apron is the only fungicide that should be used to treat turfseed.

"Apron is a powder," Clark noted. "You put it on dry to the seed and it adheres. Apron will give two to three weeks protection against pythium."

However, Clarke said, "cool, dry weather is the best fungicide."



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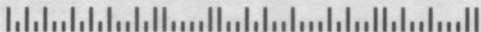
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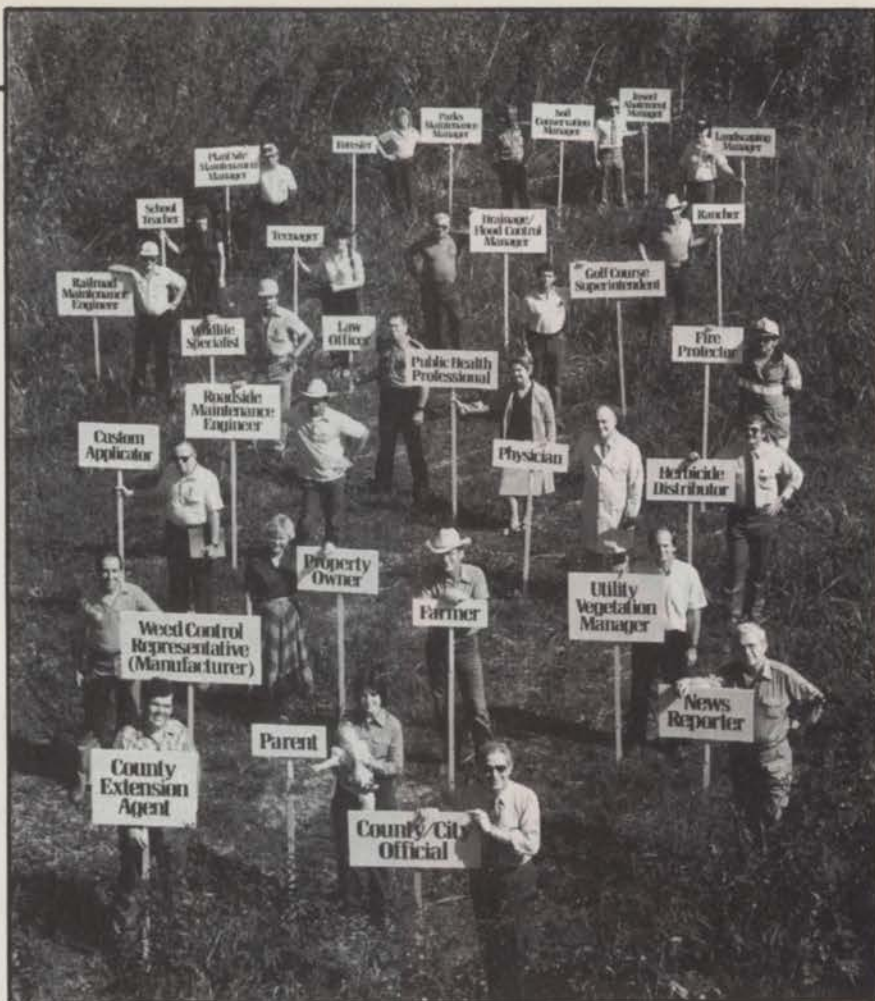
### Weeds affect everyone, says weed group

Most people think of weeds as nothing more than a slight bother when they tarnish a lawn. But members of the Weed Science Society of America say weeds have an economic impact on everyone.

"What we do and recommend and use for weed control will be determined by regulations which are prepared by people who do not understand the materials now being used—nor farmer needs, nor the contribution of weed science to food production," said Dr. S.N. Fertig, staff chief of the USDA-ARS pesticide impact assessment staff.

Weed control in agriculture can return \$3 to \$5 dollars to the farmer for each dollar spent. But the recent farm crisis has made only a small dent in the multi-billion dollar business of marketing weed killers, since the chemicals are also an important part of the Green Industry.

It's estimated that 25,000 people from 60 countries worldwide work in research and development of weed control products. In the U.S., about 2,000 researchers work for universities and government, and 10,000 are extension service specialists, advisors or custom applicators. Another 50,000 are in industrial and government maintenance or are foresters.



Who worries about weeds? Society president Dr. James D. Riggleman posed that question during the 26th annual Weed Science Society of America meeting in Houston. His slide, above, shows 28 non-scientist weed worriers standing amid a patch of "Texas-scale" weeds to symbolize the weed concerns of the average person in a typical community like Houston.

## CONFERENCES

### Landscape Expo moves to Chicago-land area in 1987

The Landscape Exposition will move to O'Hare Exposition Center in Rosemont, Ill. for its second year in 1987. More than 16,000 professional landscapers, representing 15 percent of the total industry, are located within 300 miles of the Center.

"The Landscape Expo is the only show covering the entire spectrum of suppliers," says show manager Dawn Pratt, "so we anticipate high attendance from this regional concentration, as well as at the national level."

One of the national organizations to endorse the Landscape Expo is the Professional Grounds Management Society.

"We believe the three-day conference program will give our

members increased educational opportunities," says PGMS executive director Allan Shulder. "The Landscape Expo is a very worthwhile endeavor for keeping the industry informed, and we look forward to a large turnout."

Last year's show and conference, held in Valley Forge, Pa., attracted more than 5,000 landscape professionals during its three-day run.

The Landscape Expo, co-sponsored by WEEDS TREES & TURF and LAWN CARE INDUSTRY magazines, will be held March 3-5, 1987. For information on attending or exhibiting, contact HBJ Expositions & Conferences, P.O. Box 5555, Norwalk, CT, 06854; (800) 243-2815.

## REFERENCE

### Michigan State offers turfgrass videotapes

A series of videotapes on turf tips for lawn care companies has been developed by Michigan State University and the Michigan Turfgrass Foundation.

The titles are: "Lawn Establishment" (14 minutes), "General Lawn Care" (26 minutes), "Lawn Grasses" (16 minutes), "Lawn Fertilization" (16 minutes), "Lawn Weed Control" (17 minutes) and "Lawn Maintenance Equipment" (19 minutes).

The tapes can be purchased in either VHS, ½-inch Beta or ¼-inch broadcast quality format. Prices for MTF members are \$35 per tape or \$175 per set of six. For non-members, prices are \$60 and \$300, respectively. Broadcast quality tapes are available at \$80 each or \$400 per set.

For more information, or to order tapes, write the Michigan Turfgrass Foundation, Box 275, Okemos, MI, 48864, or call Kathy at (517) 355-0270.



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## RESEARCH

### Do lawn chemicals contaminate our water?

Not much concrete evidence exists for blaming lawn care chemicals for water contamination. Penn State professor of turfgrass science Thomas Watschke is studying claims which link associate nutrients and pesticides applied to lawns with the decline of water quality.

"There is very little literature about lawns. Most data are from pasture hydrology studies. Yet a pasture is not comparable to a lawn," Watschke explains. "A lawn does not suffer the same degree of compaction or severe defoliation from grazing activity. The closest we come to that is using a lawn mower with a grass catcher."

The study has shown that differences in turf establishment methods affect runoff. Sodded plots have 15 times less runoff than seeded plots four months after establishment.

The data shows that 1,300 sq. ft. of sodded, sloped lawn, thick and green without soil patches showing through, will give off approximately 1/2-gallon per minute runoff during a peak rainfall.

On less dense, unattractive grass with bare areas separating clumps, up to 7 1/2-gallons per minute can escape during the peak.

"It appears that plant density and thatch contribute significantly to decreased runoff," Watschke says. The thicker the turf, the better its ability to decrease water movement and the greater its ability to remove nutrients and pesticides which have been applied.

Herbicides were applied to the test lawns last fall. Runoff water has been collected regularly and is currently frozen until it can be analyzed by the University's Pesticide Research Lab.

Watschke says the next step will be to add commercially-available pesticides and nutrients to study their effects. "This will finally put the cart before the horse," he says. "It will tell us what we don't know about what has already happened and is happening."

## LEGISLATION

### Federal government coming down hard on pesticide use

The EPA and the Government Accounting Office are trying to make it more difficult for commercial pesticide applicators to do business.

A proposed amendment to the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), is being re-



vised in the House Agriculture Committee. It would require licensing for all non-certified pesticide applicators. But it's an amendment that prospective groups have sought.

"Unless we upgrade with training, we are going to be so vulnerable (to lawsuits)," notes Dave Dietz, program director of the Pesticide Public Policy Foundation.

The GAO, meanwhile, is not happy with the EPA's enforcement of FIFRA. It has issued a 50-page report questioning the safety of non-agricultural pesticides. The report also recommends:

- mandatory pre-notification for pesticide applications in public places;
- warning labels on pesticides that have not met the latest registration standards; and
- government involvement in enforcing pre-notification where it is required.

The GAO report was submitted to the Subcommittee on Toxic Substances and Environmental Oversight, Committee on Environment and Public Works, U.S. Senate.

"This report is going to be used against us for years and years," says Dietz, who has recently had to field

questions on national television ("20/20" and "The Today Show").

## STATISTICS

### Lawn care industry exceeds \$2 billion

U.S. revenues of the lawn care industry reached \$2.035 billion in 1985, increasing more than 16 percent from 1984, according to a survey by C.H. Kline & Co.

The Kline report noted that rapid growth within the industry is probably attributable to:

- successful adaptation of turf cultivation and maintenance techniques from agricultural and other professional sectors to residential and commercial markets;
- implementation of a consumer-service marketing approach;
- a relatively inexpensive, time-saving and professional method of caring for lawns; and
- widespread industry expansion through start-ups and territorial expansion of existing LCOs.

The report continues: "the chemical lawn care industry will continue to grow at a strong rate through 1990, although annual increases will

be slightly lower than current performance. Assuming an annual inflation rate of 5 percent, sales are projected at \$3.9 billion by 1990."

The Kline analysis is one part of a five-chapter report entitled "Strategic Opportunities in Chemical Service Businesses." For more information, contact the company by writing 330 Passaic Avenue, Fairfield, NJ, 07006, or by phoning (201) 227-6262.

## SEMINAR

### Monsanto aids aerial applicators

Monsanto has donated \$25,000 toward a training program for proper application of aerial pesticides in forests and rights-of-way sites. The seminar is tentatively scheduled for February in Indianapolis.

Monsanto will also contribute \$1 for every gallon of Roundup and Rodeo herbicides purchased and applied via aerial application in forests and rights-of-way during 1986. The funds will be used to develop a training manual and seminar.

The Aerial Rights-of-Way Applicators Association and Purdue

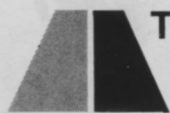
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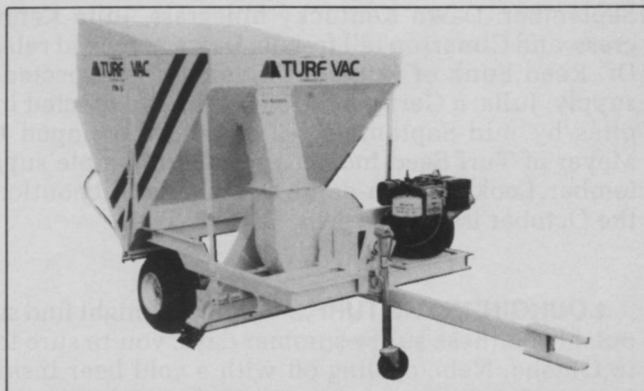
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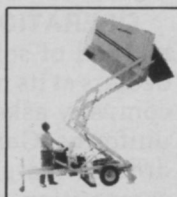
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Sweeps 48" wide



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Lifts to Dump 96"



# SHORTCUTS

**SOUTH OF THE BORDER...** Jim Mello of Nice 'N Green Lawn Care in Romeoville, Ill., is installing three polo fields in Queretaro, Mexico, 110 miles northwest of Mexico City. He is using turf-type tall fescue on the fields, which measure 10 acres. To put things in perspective, that's roughly nine times the size of a football field. When construction is completed, Mello will have installed seven polo fields, including four in the United States. He's used turf-type tall fescue on all fields.

**MORE ON TALL FESCUES...** Why turf-type tall fescues for good-looking turf? One reason, pointed out by Dr. Thomas Turner of the University of Maryland at the annual Lofts Seed Field Day, is because of the pesticide controversy. "We strongly believe we can reduce pesticide use by 50 to 75 percent with turf-type tall fescue," says Turner. "It's especially useful on sports fields. You get better footing and more rapid establishment with the turf-type tall fescues. Dr. Jack Murray at the USDA in Beltsville (Md.) is even experimenting with mixing turf-type tall fescue with zoysiagrass for sports fields."

**NOT SAFE ANYWHERE...** At least on a golf course, you're not. During thunderstorm season, metal and tall trees are not the only things lightning strikes. Tom Walker, superintendent at Inverness Club in Toledo, Ohio, host of this year's PGA, reports that lightning hit a wide-open area of his course. The 11th fairway, 25 yards from the green, took a jolt back in May. The message here is to use good judgement during a thunderstorm.

**LESCO OFFERS SEED...** Lesco Inc. of Rocky River, Ohio, is offering three new proprietary turfgrass varieties beginning in September: Dawn Kentucky bluegrass, Julia Kentucky bluegrass, and Cimarron tall fescue. Dawn, a hybrid released under Dr. Reed Funk of Rutgers University, is expected in limited supply. Julia, a German introduction, is expected in good supplies by mid-September. Cimarron, developed by Dr. Bill Meyer of Turf Seed Inc., is expected in ample supply in September. Look for an in-depth seed availability outlook report in the October issue of WEEDS TREES & TURF.

**LOUNGIN' IN THE TURF...** While you might find some people outside on these sultry summer days, you're sure to find some in Omaha, Neb., cooling off with a cold beer inside the Turf Lounge. It got its name from the horse racing track nearby.

**OPERATION EAGLE...** OMC/Lincoln devised a unique method of selling the new Cushman Eagle utility vehicle to dealers at its national dealer conference in June. Just before the company asked for orders, OMC/Lincoln employees donned uniforms. Gen. George Patton (impersonator Will Jordan) addressed the group, and Operation Eagle, a plan to defeat the competition, began. The play-acting may have worked. Dealers ordered 350 Eagles for delivery sometime in the early fall. OMC/Lincoln aims to sell 2,100 Eagles by September, 1987.

University have launched the program in an effort to establish uniform guidelines for aerial application.

The program is designed to give the applicator knowledge of pesticides, equipment, and proper application techniques, along with preparing them for an intensive certification examination. Additionally, the program may help applicators obtain insurance at reasonable rates.

"Proper handling, mixing, and spraying of pesticides as well as equipment and proper application techniques are critically important in aerial spraying," says Dr. Harvey Holt, professor of forestry at Purdue. "The training manual and seminar will help to further the applicator's understanding of the products he applies and equipment he uses."

For more information on the program write: Aerial Right-of-Way Applicators Association, c/o Dorf & Stanton Communications, 111 Fifth Ave., New York, NY 10003.

## PEOPLE

### Environmental names director, VP

**Environmental Industries** elects **Richard A. Miller** to the Board of Directors. He is a tax attorney and accountant specializing in the area of taxation. **S. Gene Giannulli** is named vice president of operations. He joined the company in 1984.



Richard Miller



Gene Giannulli

**Dr. Thomas P. Mog** is appointed director of environmental programs and **David A. Whitworth** is named horticulturist for **The Davey Tree Expert Company**. Mog will be responsible for directing the use, storage, and disposal of pesticides.



Dr. Thomas Mog



David Whitworth



A new clay carrier for Balan just made the best value in crabgrass control even better. Clay particles improve spreadability and make application more uniform than limestone or corncob carriers. Clay also greatly reduces the dust inherent to other carriers. And increases equipment calibration accuracy.

With Balan you get superior preemergence crabgrass control for eight to ten weeks with a single application. Then you can overseed

or perform other turf management jobs, without worry of reduced seed germination. If you want longer control, the Balan price allows you a second application.

Balan. The better spreader. Talk to your Elanco distributor soon. Or write:

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# Disneyland®

## LARGE SCALE LANDSCAPE MANAGEMENT

At Disneyland, there are 76 developed acres, 15 turf varieties, a million annuals, 2,500 trees, 800 plant species, 25 miles of irrigation pipe, and 42,000 sprinkler heads. It takes 45 employees year-round to do the job.

*by Heide Aungst, associate editor*







*"All the world is a stage..."*

Shakespeare wrote those words. Walt Disney believed them.

Disneyland in Anaheim, Calif., doesn't have employees. It has "Cast Members."

There aren't any customers, just guests.

And the stage isn't a raised platform in front of an audience. It's 76 acres of green turf, towering trees, and breathtaking floral displays.

The star of the show is landscape superintendent Ken Inouye, a Disney-type character himself. Inouye has the wisdom of Snow White's Doc and the smoothness of Cinderella's Prince Charming. He can oversee a landscape with the creative eye of Gepetto, Pinocchio's creator.

Of course, he has help. Disneyland's landscaping department employs 45 people, including supervisors, foremen, and an overwhelming 30 gardeners.

The crew performs an extensive amount of work during the year. For example, three pipefitters maintain an irrigation system with about 25 miles of pipes, 42,000 sprinkler heads, and 170 automatic clocks. The tree pruning crew of seven trims 2,500 trees a year, ranging from a 12-inch dwarf spruce to an 80-foot eucalyptus.

With 800 plant species represented from 40 nations, landscaping is indeed the key to Disneyland's setting.

Walt Disney had a goal when he built the theme park in 1955. "I don't want the public to see the world they live in while they're in the park," he's quoted as saying. "I want them to feel they're in another world."

#### **'God of horticulture'**

Disney left creative control to architectural designers Bill and Jack Evans. Inouye calls Bill Evans "the god of horticulture."

Evans, 74-years old, still works as a consultant to Disneyland. Inouye hopes to co-author a book on the park's horticulture with Evans.

Evans published the book *Disneyland World of Flowers* in 1965. Copies, stashed in a warehouse, were

**Far left: The patchwork garden in Storybook Land boasts more than 25 varieties of plants.**

**Purple and yellow-orange annuals decorate the entrance to Tomorrowland.**





The theme park's hero, Mickey Mouse, made up of a brilliant display of flowers, decorates Disneyland's entrance.



Phoenix *reclinata* palm trees, donated to Disneyland by Cecil B. DeMille, originally grew outside Space Mountain in Tomorrowland. Because of the remodeling of the ride, the palms are awaiting a new home.

eventually thrown out. Inouye's copy may be the only one remaining. Still, the plant varieties have changed so much in the last 30 years that an updated version is needed.

One change was an expansion from 10 turf varieties to 15, for what Inouye describes as "evolutionary reasons." Turf covers only about three acres at Disneyland. Railings surrounding the lawn areas made it possible to replace tough varieties designed for heavy traffic with more visually appealing turf.

"I give credit to the turf industry for developing the many varieties which cater to different needs," Inouye says.

Turf includes Santa Ana, Tifdwarf, and other varieties of bermudagrass; St. Augustinegrass; the bluegrasses Pennblue and Marathon; and fescues, including creeping red fescue.

The velvet-looking bright green grass outlining the entrance to Storybook Land is really a hardy zoysiagrass.

Where turf doesn't grow, there's sure to be one of about 10 varieties of groundcover.

Inouye uses few turf mixes because it lessens the impact. He approaches flower usage the same way.

"From a design aspect large quantities are more impressive than mixtures," Inouye explains. "When we put anything in for color, we plant a lot of them."

### Ever-changing color

"A lot" is an understatement. The seven acres of flowerbeds hold 800,000 to a million annuals a year.

Inouye's agricultural background sneaks through when he refers to his "croplists" of annuals. About 60 percent of the flowers are ordered three months to two years ahead of time. All flowers aren't pre-ordered because of rotation of the beds.

Beds are replanted every three to four months. Usually healthy plants aren't replaced, although about 20 percent of the time flowers are changed regardless of their condition.

Soil is also changed every several years. Disneyland soil is a combination of sand, redwood sawdust, and nutrients.

Color plays a big role in landscaping Disneyland. The flowers bring animation to the landscaping, the way Disney himself brought it to the screen.

The entrance to Tomorrowland, for example, is 4,000 sq. ft. of blue and yellow flowers—pansies in the summer; ageratum and yellow marigolds in the winter.

One day Inouye decided to change the flowers to orange and yellow. "I





# Penncross performs on Desert Isle

Famous 17th green, PGA West, LaQuinta, CA

## Penncross not only survives, but thrives on all 18 greens at this innovative Pete Dye designed course.

You've seen this awesome 17th green in pictures, or maybe you've had the good fortune of playing this 147 yard challenge, but we're reasonably sure you didn't know that it's Penncross creeping bentgrass. Television announcers won't tell you and magazines don't print it, but the putting greens that have made more champions on some of the greatest courses in the world are Penncross.

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Pete Dye specified Penncross for *this* desert isle, as he did for his famous Sawgrass island green in Ponte Vedra, Florida. Penncross is no ordinary putting green grass . . . and Pete Dye is no ordinary designer.

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Watch Penncross perform in the *Skins Game* at PGA West, Nov. 29 and 30, 1986.

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Disneyland's landscape superintendent Ken Inouye shows off a topiary hippo near the "It's A Small World" ride in Fantasyland.

got bored," he says casually. "Boy, did I hear about it!"

Seems the orange just didn't match the blue and yellow umbrellas on the nearby tables.

Although seasons don't hit southern California in the form of drastic weather changes, they sweep through Disneyland in varying hues.

Winter finds the park decorated in blues and reds. Christmas poinsettias are used as bedding plants.

Spring and summer comes alive with bright pinks, oranges and yellows. White, a color used year round, is especially evident in the dozens of Easter lilies planted to mark the season.

### Shrubs: time to mature

Besides the flowers, Inouye's crew uses other plant materials to define the moods of the different "lands" guests wander through.

Tomorrowland's shrubs are pruned in futuristic geometric shapes.

Frontierland, sporting a rugged look, could pass as the backdrop of an old John Wayne flick. The drought-tolerant ornamental grass, penecetum, at the entrance to Frontierland adds to the wild West look.

Few aren't charmed by the topiary animals found near the "It's A Small World" ride in Fantasyland. The shrubs, shaped into elephants, hippos and the like, take five to 15 years to develop.

The animals are made from a variety of shrubs such as junipers, including Armstrong and Sea Spray.

All in all, Disneyland has nine acres of shrub areas.

Fantasyland also boasts one of the two areas of the park which Inouye considers his biggest challenge. Storybook Land could be a horticulturist's nightmare, but to Inouye it's a dream.

Spectators take a boat ride through the mouth of a whale into the miniaturized land. The landscaping is de-

signed on a one-tenth scale.

A three-inch weed on such a scale is magnified to look like a 10-foot giant against a three-inch house. "It's one of the higher maintenance areas," he says.

The dwarf albeta spruces in Storybook Land developed when their roots were confined by a glacier. Tree roots are kept confined in metal containers to slow foliar growth. The trees live about five years.

"Turf" in Storybook Land ranges from Irish moss to Korean grass. Patchwork gardens display about 25 plant varieties of different colors and textures. At a distance the gardens look like someone spread Grandma's homemade quilt on the river's bank.

Inouye's crew is also responsible for maintaining the river and the 17 million gallons of circulating water used on rides in the park.

"We use chemicals in the waterways, but nothing stronger than pool chlorine," Inouye explains. "We dye it to make it look dirty."

Inouye tries to avoid using any toxic plant materials or chemicals in the park. After all, children will stick anything in their little mouths.

Although Inouye has four full-time licensed pest control operators on staff, he tries to use cultural methods for controlling insects.

One way of doing this is by using plant varieties with a natural ability to combat pests. Regular pruning and keeping dead foliage off trees also helps prevent infestations.

When a problem does occur, often spraying a plant with untreated water will work just as well as chemicals.

### Did you know?

Disneyland is not without its share of cocktail party trivia. Like, did you know that the Phoenix reclinata palm trees usually in front of Space Mountain (they're now awaiting a new home because of remodeling) once belonged to Cecil B. DeMille?

Or, that the wood preventing the beautiful *lepto spirma* tree from falling into the water surrounding Sleeping Beauty's Castle is from a Mexican ironwood, one of the few woods which won't deteriorate in water?

Or, that the "original" live Swiss Family Robinson tree is still growing only a few miles from Disneyland? (Rather than move the tree, they built a concrete ficus, but got the striatia going the wrong way in the process).

Well, Inouye confesses, working at Disneyland is bound to make even a landscape superintendent a great storyteller. **WT&T**

Photographs and "Disneyland" logo provided courtesy of Walt Disney Productions.





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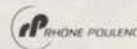
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# 1986 GUIDE TO:



# TURF, TREE & ORNAMENTAL FERTILIZATION

by Richard Rathjens and Roger Funk, Ph.D., The Davey Co.

## TURF FERTILIZATION

Frequently overlooked in determining a fertilizer program are nutrient influences on carbohydrate reserves, root growth and the plant's ability to tolerate disease and environmental stress.

### Time of application

Good timing of fertilizer applications builds carbohydrate reserves and promotes root development. The response of warm-season and cool-season turfgrasses differs.

The major cool-season turfgrasses (bluegrass, perennial ryegrass, fescue, and bentgrass) initiate and develop root systems in the early spring and fall. Fall nitrogen applications will in-

crease carbohydrate reserves and root growth. It also improves turf density by promoting greater rhizome and tiller growth.

In addition to regular fall fertilization (September-early October), a relatively new concept known as late fall or late-season fertilization is being included in many maintenance programs. Late fall fertilization is applied when shoot growth slows or around the time of the season's last regular mowing.

Nitrogen applied at this time aids the photosynthetic production of carbohydrates. These carbohydrates are stored for use the following growing season, providing earlier spring green-up and an energy source for turfgrasses to recuperate from stresses.

Another reason for late fall fertilization is to reduce the need for high

amounts of spring-applied nitrogen. Too much spring fertilization can actually reduce carbohydrate reserves and root development by inciting rapid shoot growth. This is because growing shoots take priority over roots for carbohydrate use.

Both spring and summer fertilization is used to maintain the color and density produced by fall and late fall fertilization the previous year. Fertilization at these times should not produce succulent plant tissue which can increase the severity of turfgrass disease and reduce the plant's ability to withstand heat, drought, mowing or wear stress.

Potassium applications contribute to the plant's hardiness and help "temper" the stimulating effects of nitrogen applications.

In contrast, most root growth in warm season grasses—such as bermuda, zoysia, and St. Augustine—occurs in spring and summer. Fertilization during these periods stimulates root growth. However, only moderate early spring applications should be used in areas where warm-season grasses go dormant in winter.

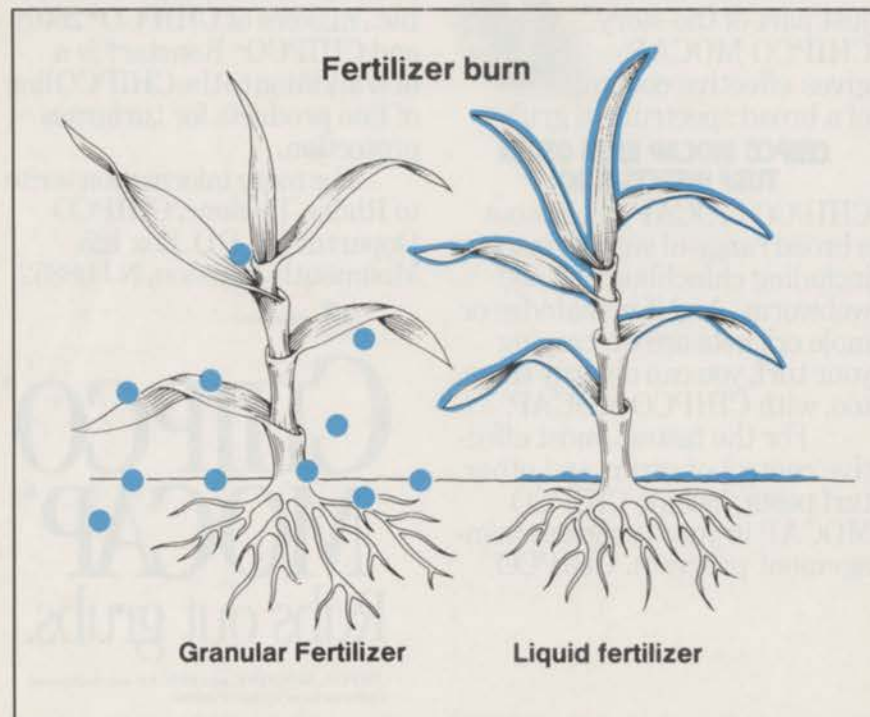
The roots of bermudagrass and St. Augustinegrass die in the spring following green-up. Heavy fertilization in early spring may result in more stress during this critical survival period.

Like cool-season turfgrasses, warm-season grasses accumulate carbohydrate reserves in the fall when shoot growth slows. Care must be taken with the timing of fall fertilization since it may decrease low temperature hardiness if applied late.

Maintaining proper potassium levels in the fall will increase tolerance to low temperatures. As with cool-season turfgrasses, too much summer nitrogen fertilization can increase injury of warm-season grass subjected to stresses.

Maintaining adequate soil potassium levels will help warm-season  
*continued on page 28*

Rathjens is senior agronomist and Funk vice president of technical and human resources for The Davey Co., Kent, Ohio.



Granular fertilizers may fall to the ground; liquids coat the plant, thus increasing burn.



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# “Nutriculture™ lets me fertilize all year without fear of burning”

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Even in the hottest, driest weather, Dave Tooley knows he can rely on Nutriculture water-soluble fertilizer to help keep his greens and fairways in optimum condition, without fear of burning.

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—Dave Tooley  
Superintendent  
Lakewood Golf Course  
Lakewood, Colorado







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You can spray WEEDONE® brand DPC AMINE herbicide any time weeds are actively growing. Year-round.

And you can tank-mix with fertilizers for 'weed and feed' treatment.

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A dependable, all-round amine herbicide with the spot control effectiveness of an ester. Ask your turf chemicals supplier about new WEEDONE® brand DPC AMINE broadleaf herbicide. It could make life easier for some people you know.

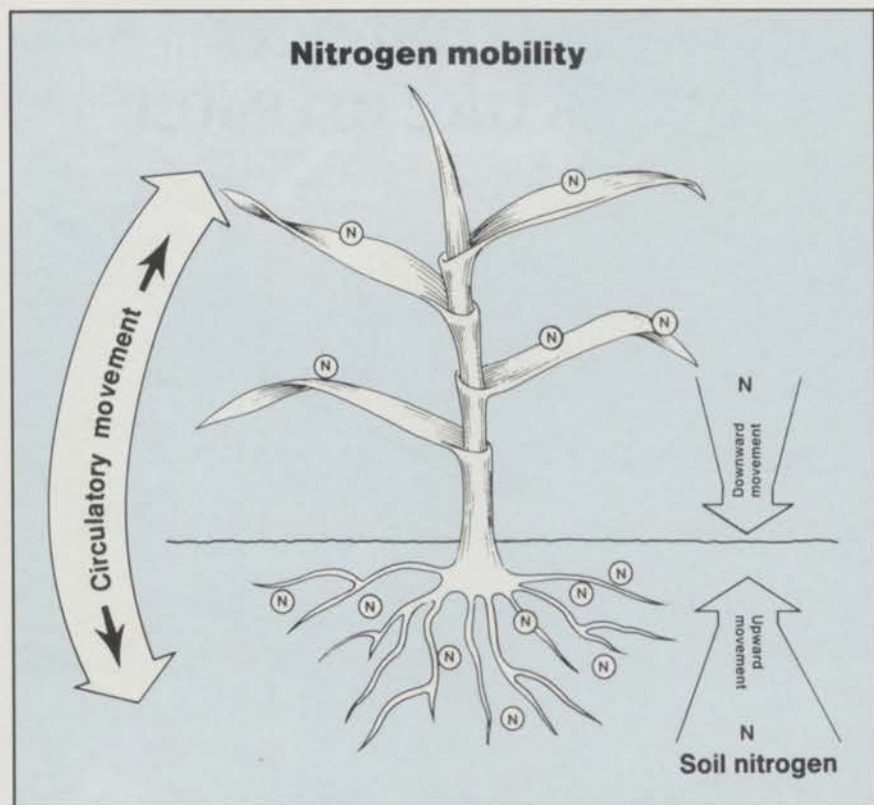
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From the turf care group at Union Carbide

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Circulatory movement: upward in the xylem, downward in the phloem.

turf's tolerance to heat, cold, mowing and wear stresses, and reduce susceptibility to turfgrass diseases.

### Rate of fertilization

To determine annual nitrogen requirement (pounds per 1,000 sq. ft.), several factors should be considered: length of growing season, degree of quality desired, purpose for which the turf is used, and the species and cultivars present.

Growing season length (time between the last killing frost in the spring to the first in the fall) varies. Along the Gulf of Mexico and in certain areas of Arizona and California, it exceeds eight months. Portions of Maine and Minnesota, however, have as little as three and a half months. The longer the growing season's length, the more nitrogen is needed to maintain turfgrass quality.

The rate of fertilization can be tailored to meet different expectations in quality. A home lawn maintained for aesthetic purposes, for example, can range from a weed-free turf of acceptable color and density to a season-long turf of premium appearance.

The turf's purpose, whether for aesthetics or recreation, will also influence the nitrogen fertility level. The fertilization rate of bentgrass, for

### Research shows turf response is equal regardless of the method of (fertilizer) application with sources like urea.

instance, can vary from four to 10 pounds of nitrogen per 1,000 sq. ft. Lower rates may be used for a pleasing appearance on a home lawn while higher rates can maximize a putting green's playability.

Turfgrass species and cultivars can vary in amount of nitrogen needed for maximum quality. Sheeps, hard, and red fescues require a low level; Kentucky bluegrass a medium level; and bentgrass a high level of fertility. Improved cultivars of bermudagrass need more nitrogen than common bermuda.

Cultural practices like irrigation and clipping removal may require more nitrogen per year to keep the desired turfgrass quality. Supplemental watering will increase the rate at which nitrogen is leached from the

root zone. Losses can be substantial when quick-release nitrogen sources are applied to sandy soils.

Clipping collection following mowing has been estimated to remove about 20 percent of the nitrogen applied to turfgrass. Using more nitrogen may be necessary to maintain quality when collecting clippings.

Phosphorus and potassium have been routinely applied along with nitrogen using fertilizer with ratios such as 3:1:2, 5:1:2 or 4:1:1. These ratios are based on the relative amounts of nitrogen, phosphorus, and potassium found in turfgrass clippings, but do not take into consideration the levels in the soil.

Their use should be based on a soil test. Many soils contain high levels of phosphorus and little, if any, response is obtained by applying more phosphorus.

Two factors to be considered in making individual nitrogen applications are source and time of year.

Quick-release nitrogen sources (for example, ammonium nitrate and urea) are commonly limited to no more than one pound of nitrogen per 1,000 sq. ft. This rule of thumb is followed in spring and fall to avoid excessive shoot growth. For this same reason, summer applications using quick-release sources are often limited to no more than one-half pound of nitrogen per 1,000 sq. ft. Lower rates of quick-release sources also minimize the possibility of fertilizer burn.

### Method of application

Fertilizers can be applied in either dry or liquid forms. Research shows turf response is equal regardless of the method of application with nitrogen sources like urea. The application method then may be determined by the turf manager's perception of productivity and personal preference.

Two types of spreaders are used to apply granular (dry) fertilizers: gravity and centrifugal.

With the gravity (drop) spreader, fertilizer is held in a trough and agitated by a mixing bar connected to the wheels. The fertilizer is dropped through a series of slots to the turf below in defined swaths.

The centrifugal (broadcast) spreader is commonly used by commercial turf managers because it applies a wider swath of material and can treat large areas more quickly. It features a hopper with the fertilizer falling through a hole (or series of holes) onto a spinning disk which propels fertilizer ahead and to the



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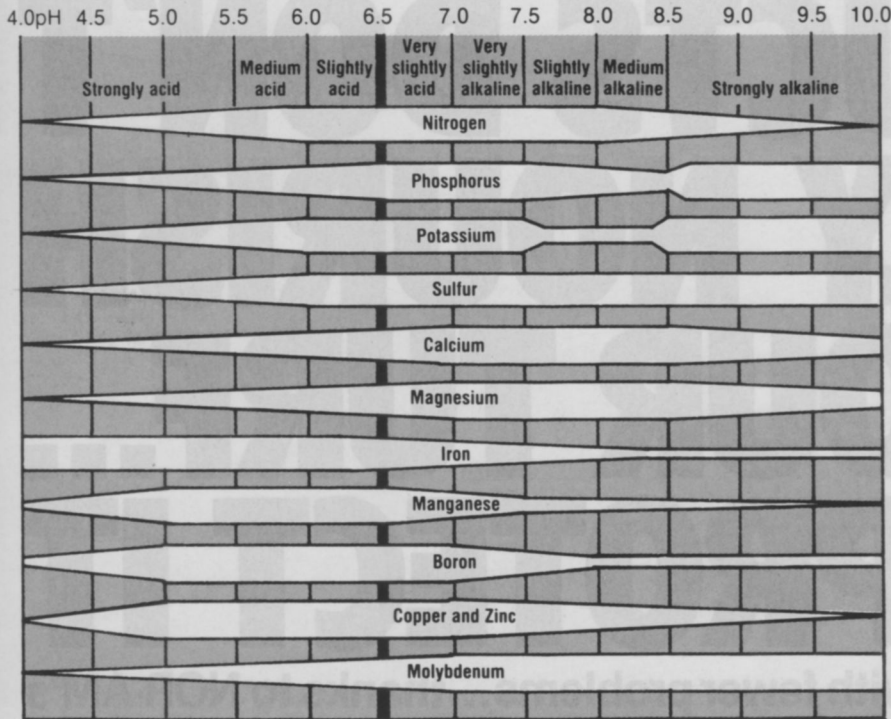
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## Maximum nutrient availability

Maximum availability is indicated by the widest part of the bar



sides of the spreader.

With a liquid application method, fertilizer is either solubilized or suspended in water and sprayed on the turf. The amount of water normally varies from one to five gallons per 1,000 sq. ft.

Spray equipment can be broadly classified into either low pressure spray booms or high pressure (hydraulic) sprayers. Both types feature a tank, pump, pressure regulator, strainers or screens, and nozzle(s).

Low-pressure spray booms, as the name implies, are operated at pressures in the range of 15-60 lbs. per sq. in. (psi) and deliver one gallon or less of spray per 1,000 sq. ft. They are designed to be driven over large areas delivering the spray from a series of nozzles in distinct swaths. They are often used on golf course fairways.

High-pressure sprayers can create several hundred pounds or more of pressure. They use a hose and hand-held nozzle for directed application, and are used by lawn care companies.

## TREE AND SHRUB FERTILIZATION

Landscape trees and shrubs are often subject to adverse soil and environmental conditions. Compacted soils, poor drainage, restricted root areas, highway salts, air pollutants and com-

*Exact fertilizer needs are difficult to judge in interiorscape maintenance without measuring light at strategic locations.*

petition from turfgrass contribute to plant stress, thus increasing the importance of regular fertilization.

Vigorous trees are more resistant to insects and disease, more attractive, and a greater asset to properties.

Only nitrogen, phosphorus and potassium are normally applied in tree fertilization. However, supplemental micronutrients such as iron and manganese may be necessary for certain species growing in alkaline or sandy soils.

Plants often respond to nitrogen applications with dramatic improvements in shoot growth and leaf color. Because nitrogen is transitory in soils and relatively large amounts are used by plants, soil analysis is not particularly useful. Heavy applications of nitrogen alone may stimulate shoot growth more than root growth, disturbing the natural root/shoot ratio.

The need for supplemental phosphorus and potassium is more difficult to determine since they do not produce a visible response except on young or newly-transplanted trees and shrubs.

Results from field studies also have been inconsistent because of differences in soil, age, condition and location of test species, and the timing and method of application. Where reliable soil tests are not available for phosphorus and potassium, most arborists use a complete fertilizer on all trees and shrubs.

Since arborists must be concerned with trees and shrubs in a wide variety of soil conditions, the most practical approach to fertilization is to provide an effective formulation for trees and shrubs in a geographic area.

Specific soil/plant deficiencies may be addressed, if necessary, on an individual basis. In most cases a 3:1:1 (or similar) ratio is satisfactory, but more potassium and/or micronutrients may be advisable in sandy or alkaline soils, particularly for ericaceous or other so called "acid-loving" plants.

## Application rates

Most fertilizer recommendations are based on the size of the growing area for shrub beds or the branch spread for individual trees and shrubs.

Fertilizer recommendations based on trunk diameter can result in over-fertilization and plant damage if the root system is restricted by paved areas, foundation walls, or other obstructions.

Three pounds of actual nitrogen per 1,000 sq. ft. per year, or six pounds every other year, will keep deciduous trees and shrubs healthy and vigorous. If leaf color, annual growth or general vigor is unacceptable, six pounds of nitrogen per 1,000 sq. ft. may be applied annually.

Broadleaf evergreens, small shrubs, flowering trees and recently-transplanted or declining trees are more sensitive to fertilizer salts. These plants should receive only about one-half the recommended rate, particularly when quick-release fertilizers are applied. The risk of injury to sensitive plants may be reduced by splitting the recommended annual amount into two or more applications.

The amount of fertilizer per 1,000 sq. ft. of root area can be calculated by dividing the percent nitrogen on the fertilizer bag into the desired nitrogen

*continued on page 34*



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**Total Turf Care from the  
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**IMPORTANT:** Please remember always to read and follow carefully all label directions when applying any chemical.





Spray systems such as the one shown above are used to apply nutrients to turfgrass.

## NITROGEN FERTILITY LEVELS

lbs./growing month/1,000 sq. ft.

HIGH .5-1.5	
Kentucky bluegrass	bermudagrass
creeping bentgrass	
MEDIUM .4-1.0	
zoysiagrass	colonial bentgrass
tall fescue	velvet bentgrass
perennial ryegrass	St. Augustine-grass
annual bluegrass	
LOW .2-.6	
carpetgrass	red fescue
chewings fescue	
VERY LOW .0-.4	
blue grama	bahiagrass
buffalograss	centipedegrass

per 1,000 sq. ft.

For example, to determine the amount of 30-10-10 fertilizer required to apply six pounds of nitrogen per 1,000 sq. ft., divide .30 into 6, which equals 20 pounds.

### Application timing

Although the roots of woody plants may elongate during the growing season, active root growth most often occurs in early spring and late fall when soil temperatures are cool and leaves offer little competition for water and nutrients.

Fertilization is most effective when supplemental nutrients are available during periods of optimum root growth. Soluble nitrogen fertilizers, because of their short residual in soils, should be applied between October and December and/or between February and April. Controlled-release nitrogen ensures availability in the root zone for a relatively long period, depending upon the nitrogen source's solubility. The application timing of these fertilizers may not be a major concern.

### Application techniques

Supplemental nutrients can be supplied to landscape plants through foliar sprays, trunk injections, or applications on or beneath the soil surface. Though each method has advantages in specific situations, woody plants in most cases respond best to soil applications.

#### Surface applications

Nitrogen fertilizers can be applied to the soil surface, since nitrates are highly mobile and will move downward into the root zone. When fertilizing woody plants in sodded areas, surface application should be limited to no more than three pounds of nitrogen per 1,000 sq. ft. from a controlled-release source. However, since turfgrasses in the application zone may be injured or respond with undesirable succulent growth, sub-surface applications are often used on trees and shrubs in quality lawns.

Fertilizer with phosphorus should not be applied to the soil surface. Phosphorus is bound to soil particles and does not move downward to contact the absorbing roots. Surface applications of phosphorus may also stimulate annual bluegrass, which is undesirable in home lawns.

#### Drill hole technique

Fertilizer can be placed in the root zone by dividing the recommended amount of fertilizer equally among

drilled holes in the ground. For trees, holes should be 12 to 18 inches deep and 18 to 24 inches apart, beginning two to three feet from the trunk and going two to three feet beyond the drip line.

To prevent turfgrass injury, fertilizer should be at least four inches below the soil surface. Calcined clay, perlite, or other soil amendments can be used to fill the top of the hole or, in quality lawns, a plug of grass can be removed before drilling and replaced after adding fertilizer.

#### Soil injection

Liquid soil injection is a fast, economical alternative to the drill hole technique. A hydraulic sprayer operated at 150-200 psi and an injector probe inserted about 12 inches into the soil are needed. The injections are normally in a grid pattern about three feet apart within and slightly beyond the tree canopy.

Soil injection can mean more thorough nutrient distribution than the vertical hole technique, and generally can be done in about one-fourth the time.

Unfortunately, most soluble fertilizers have a high burn potential and soluble nitrogen may leach from the root zone. It may remain in the root zone for as little as six weeks.

Because of the limits of liquid soluble fertilizers, suspension fertilizers for soil injection are becoming popular. Ureaformaldehyde is particularly effective as a controlled-release nitrogen source in soil injection systems. Its release rate is not greatly affected by particle size. Suspended in water, powdered ureaformaldehyde can be injected into the soil by hydraulic pressure.

Two recent introductions, soluble methylol and methylene ureas, have a lower burn potential than urea or other soluble nitrogen sources.

#### Other methods

The aerofertil technique injects dry fertilizer by blasts of air into drilled holes in the soil. This method is similar to drill hole application, but provides additional aeration by breaking up heavy or compacted soils.

Fertilizer stakes or spikes are driven into the ground at intervals beneath the drip line of trees and shrubs.

Although they contain enough fertilizer, spikes are expensive and not as effective as other fertilization methods. One or two spikes per inch of trunk diameter provide only a small amount of fertilizer, not all of which comes in contact with the root system since there is little lateral distribution within the root





Dick, ProTurf already has a 15-0-30 High K fertilizer for fairways. Why did you feel you needed something for greens?

"On greens, you want a fertilizer with a very small particle size. Much smaller than our fairway product designed for the big rotary spreaders."

**Why does particle size make a difference?** "The smaller particles disperse evenly from the spreader, filter down into the turf, and disappear when you water. There's less chance they'll affect a putt or stick to shoes and get tracked around."

**That sounds good for the golfers.** "Superintendents will like it, too. In addition to being small, each particle is homogeneous. So, even at half the regular application rate, there's no chance of getting the kind of speckling you might see if you used a coarse blend. And more particles per square inch produces a more desirable, uniform greening response."

**"We developed this new version of 15-0-30 High K fertilizer especially for greens. And golfers."**

Dick Westfall, Scotts Research project leader (Fertilizer R&D), talks about new High K Greens Fertilizer.

**Now tell me why High K will be good for my greens.**

"High potassium levels have been found to enhance turf performance, particularly under stress conditions—improving drought hardiness, resistance to disease, and wear tolerance. There's also evidence that high potassium reduces winter kill in bermudagrass."

**Why is there so little nitrogen?** "To prevent over-stimulating top growth. For example, High K Greens can be used at double rates to build potassium levels in sand greens and you'd still be applying only 1 pound of N per 1,000 square feet. Or you can use it at regular rates on any greens that are on a low nitrogen diet. It can also be used at any time of the year."

**Anything else we should know about ProTurf High K?**

"If you like what it does for fairways, you'll love what it does for greens."

**For more information on new High K Greens Fertilizer, call your ProTurf® Tech Rep. Or call Scotts® direct at 800-543-0006. In Ohio, call collect 513-644-2900.**

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## Annual Nitrogen Requirement of Turfgrasses\*

Species	Length of Growing Season, Months	Nitrogen per Season lbs./ 1,000 sq. ft.	Variations in Management
<b>Cool-Season:</b>			
sheeps & hard fescue	4- 8	0- 3	low maintenance; roughs
red fescues	4- 8	1- 3	low maintenance to good care
Kentucky bluegrass	5-12	2- 8	lawns, fairways
bentgrasses	4- 8	1- 4	medium care, lawn, fairways
bentgrass, greens	5-12	6-15	clippings removed, forced growth
<b>Warm-Season:</b>			
zoysia	6-10	1- 6	adequate cover
common bermuda	7-12	2- 8	most variable
St. Augustine, bahia	10-12	2- 8	warm areas, lawns
bermudagrass, fairways and tees	5-12	4- 9	good management
bermudagrass, greens	8-12	8-20	may rest over winter

\*Adapted from Turf Managers' Handbook by William H. Daniel and Raymond P. Freeborg, published in 1973 by Harvest Publishing Company, New York, N.Y.

zone of most soils.

Foliate sprays, trunk injections and implants can supply limited nutrients to woody plants. They are recommended for micronutrients whose availability is reduced by alkaline soils. These methods are most effective when a single micronutrient is deficient.

### FERTILIZATION OF TREES AND SHRUBS IN CONTAINERS

Growing trees and shrubs in landscape containers is common where plants are desirable but suitable planting sites limited.

They need careful attention because the reservoir of available growing media—minerals and water—is much smaller. Container soils, often wet and poorly aerated, can leach excessively and require a regular fertilization program.

In general, recommended fertilizer rates for landscape plants based on square footage have been successful in maintaining container-grown plants.

A complete fertilizer applied at an annual rate of 0.5 to 1.0 ounce of nitrogen per 10 sq. ft. of container soil surface is usually used. However, because of the wide selection in plant material and variations in container design and growing media, fertilizer needs are best determined by soil and tissue analysis.

Container plants can be fertilized by dry, foliar, and liquid application.

As with landscape plants, foliar applications are usually limited to micronutrients.

Foliar fertilization is effective where soil conditions may slow root absorption or where a quick response is needed. The spray should be contained, since some micronutrient sources can stain.

Dry fertilizers may be applied either in controlled release or quick-release form. High analysis fertilizers may be difficult to distribute evenly because of the small amount needed per container. Liquid applications of soluble or suspension fertilizers provide a uniform dosage and fast and easy distribution, but more frequent

applications may be needed because they may leach from container soil.

### FERTILIZING INTERIOR PLANTS

During production, the foliage plant growth is quickened by using high rates of nutrients. These same plants grown indoors, however, usually get less light, and neither need nor will tolerate the amount of fertilizer they received in production.

Exact fertilizer needs are difficult to judge in interiorscape maintenance without measuring light at strategic locations.

Light varies from one side of a room to another, often within a few feet. Usually, the stronger the light under which foliage plants are growing, the more nutrients are needed. Recommended annual fertilizer rates can vary from as low as 0.3 grams of nitrogen per square foot for low light intensities to 3.0 grams for high intensities.

A complete fertilizer with a nitrogen/phosphorus/potassium ratio (similar to those recommended for landscape plants) is suitable for indoor plants. The highest levels of nutrients should be applied at highest growth periods, for most plants, spring and summer, when natural light is strongest.

Micronutrients are seldom recommended but may be needed when growing sensitive plants in media other than soil. The rubber plant (*Ficus elastica*) and the Areca palm (*Chrysalidocarpus lutescens*) are both sensitive to boron deficiency.

In addition, the Areca palm can also become zinc deficient. However, over-applications of micronutrients can cause toxicity problems.

Nutrient levels are determined by plant species. Plants normally grown under low levels of fertility include many ferns and fleshy plants such as Peperomia. Plants needing high nutrient levels include rapidly-growing species and large-leaf plants such as Ficus and Schefflera.

Salt, both from fertilizer and irrigation water, can build up unless the root area is periodically flushed with excess water which is allowed to drain away. This is true when plants are over-fertilized during periods of low light and/or little growth.

Since visual symptoms such as stem rot and leaf necrosis in new growth are similar to those of over-watering, the soil should be tested for soluble salts.

WT&T



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*Shown is a half-gram each of granular sulfur-coated urea fertilizer (-6/+16) and LESCO ELITE sulfur-coated urea fertilizer.*

The chance of mower pickup is virtually eliminated with ELITE fertilizers because the new small particles readily filter into the turf.



*The chance of mower pickup is virtually eliminated with the new LESCO ELITE fertilizers.*



Granular Sulfur-Coated Urea (-6/+16)



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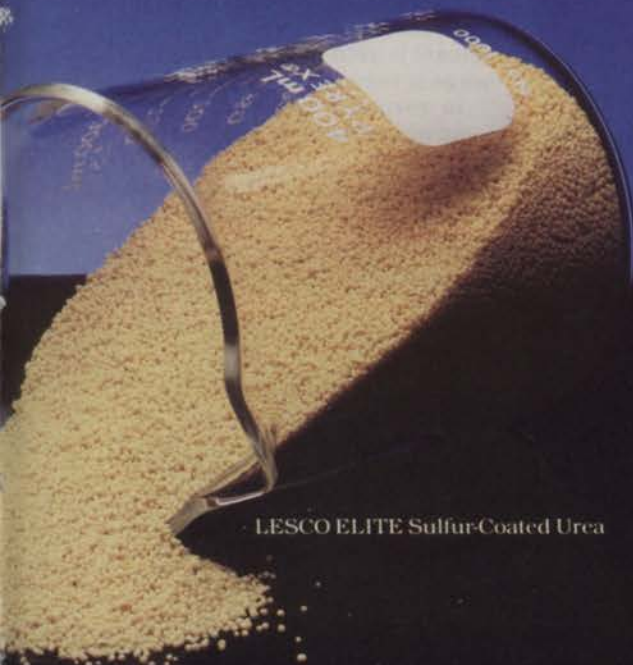
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# THE DECIDING FACTOR

Water. Its availability may be the deciding factor when choosing a turf variety. Your choice should reflect water availability in your area.

by Dorothy F. Borland



It's national news every night. In newspapers across the country, the water shortage is reported. The potential repercussions of long-term shortages are highlighted.

Because of the shortage, methods are being explored to eliminate or ease the low water supply.

Two common methods are: (1) finding new water supplies through construction of water diversions or buying water rights; or (2) through restrictions on how available water may be used. Obtaining new water supplies is time consuming and quite expensive.

Regulating water use is an easier method. Unfortunately, too many municipalities prefer to legislate than educate on intelligent water use, especially in relation to water use in the landscape.

Of water used in urban areas, estimations indicate approximately 50 percent is used on the landscape. This usage is very visible.

In response to water shortages, some municipalities have limited the

Dorothy Borland is a turfgrass consultant with The Turf Expert in Denver.

Buffalograss provides a nice turf on this home lawn in the month of June.



The smooth brome/tall fescue mix at two maintenance levels. At left, irrigation every three days. At right, irrigation as needed, perhaps twice a month. Notice the difference in turf density.



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Aspen / 



**TABLE 1**  
**Dryland turf possibilities**

NATIVE TO GREAT PLAINS	INTRODUCED
<b>WARM SEASON</b>	
Buffalograss	Bermudagrass
Blue grama	Zoysia
Sideoats grama	Windmillgrass
Saltgrass	
Nimblewill	
<b>COOL SEASON</b>	
Western wheatgrass	Kentucky bluegrass
Thickspike wheatgrass	Crested wheatgrass
Streambank wheatgrass	Smooth brome
	Tall fescue

**TABLE 2**

Grass	C/W <sup>1</sup>	I/N <sup>2</sup>	B/S <sup>3</sup>
Kentucky bluegrass <i>Poa pratensis</i>	C	I	S
Smooth brome <i>Bromus inermis</i>	C	I	weak S
Tall fescue <i>Festuca arundinacea</i>	C	I	B
Crested wheatgrass <i>Agropyron cristatum</i> or <i>A. desertorum</i>	C	I	B
Western wheatgrass <i>Pascopyrum smithii</i> was <i>Agropyron smithii</i>	C	N	S
Buffalograss <i>Buchloe dactyloides</i>	W	N	S
Blue grama <i>Bouteloua gracilis</i>	W	N	B
Bermudagrass <i>Cynodon dactylon</i>	W	I	S

<sup>1</sup>C = cool season; W = warm season

<sup>2</sup>I = introduced grass; N = native to Great Plains

<sup>3</sup>B = bunch grass; S = sod former

size of bluegrass lawn that is allowed. Homeowners and commercial developers try to reduce water costs by eliminating the most water intensive part of the landscape—the lawn.

Oftentimes, the bluegrass lawn is replaced with non-water-using materials such as gravel or lava rock.

Rock, in small quantities and in tune with the landscape, can be an attractive addition.

All too often, any grass that is removed is replaced, almost inch for inch, with acres of rock. Few of us find large acreages of identically-sized rock attractive. We often don't consider the increased heat load on the building from this material.

With these developments as impetus, plus the desire to reduce maintenance, people are looking for landscape plants and grasses that can be substituted for bluegrass and more traditional plants without a loss in the visual quality of their landscape.

### Drought tolerance

In the past, we have been led to believe that "you can't overwater bluegrass" and that bluegrass is not drought tolerant. These are both false, yet hard to shake from our landscape beliefs.

In commercial settings, the major concern is reducing water costs while maintaining a green landscape. The homeowners typically are more interested in reducing the time they must spend in their yard with water savings as a secondary benefit.

In reality, reducing water use will also reduce maintenance needs, resulting in savings of water, time, and money.

Turfgrass research at universities across the country are exploring two areas: (1) water needs of the familiar turfgrasses and breeding more tolerant varieties of these grasses; and, (2) new species of grasses.

Both areas of research are valuable and needed. Here, we will concentrate on new grasses for turf use.

### No cure-all

There are quite a few grasses that show promise as turfgrasses while offering low water and maintenance needs. But there is no one grass that is the answer for all situations and no grass is completely bad.

Also, there are several techniques that can be used on any turfgrass to reduce water use and maintenance, methods such as reducing turf areas with decks or shrub beds, monitoring irrigation amounts closely, and reducing mowing frequency.

To find "new" turfgrasses, turf researchers and managers have been

looking to range science and to neglected areas where grasses have naturalized and are thriving without irrigation. If these grasses can perform well with only natural precipitation, their performances should improve with a little supplemental irrigation and fertilization.

Many times, people associate dryland grasses with native grasses (Table 1). This is often not the case. Some prefer to concentrate more on the warm season/cool season classification than on the native vs. introduced classification.

If a grass is adapted to an area and

*There is no one grass that is the answer for all situations and no grass is completely bad.*

can survive without irrigation, it has potential for turf use.

A cool season grass (bluegrass, ryegrass, and tall and fine fescues) produces bursts of growth in the spring and fall when temperatures are cool. Without supplemental irrigation, these grasses will go into a natural dormancy mid-summer until cooler temperatures and moisture return.

On the other hand, warm season grasses, such as bermudagrass, buffalograss, and zoysia, produce their best growth when temperatures are warmer in the middle of the summer. Warm season grasses go dormant and turn tan when temperatures drop and days grow shorter.

In Colorado, buffalograss goes dormant after the first heavy frost and remains tan colored until about three weeks after bluegrass has begun to green-up.

Knowledge of the growth cycle of the grass affects the fertilization program and the winter appearance of the turf. In many southern states, dormant bermudagrass is overseeded with a ryegrass in the winter to maintain a lush green turf area.

This is most common on golf courses at winter resorts. This shows that dormant winter-season grass is not acceptable.

Let's look at some cool season grasses that can be used as turf. Table 2 lists characteristics of these grasses.

### Kentucky bluegrass

Although bluegrass is the turf standard, it can be used selectively in a landscape, and with a little extra attention, can prosper with reduced



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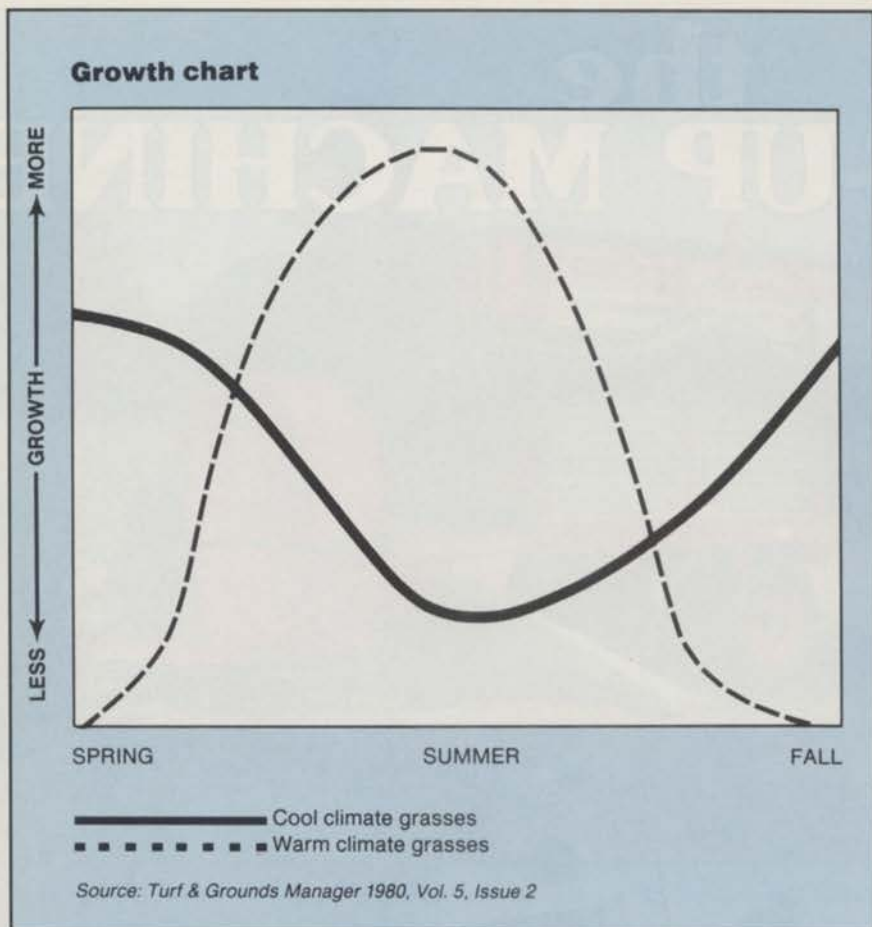
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*Of the water used in urban areas, estimates indicate approximately 50 percent is used on the landscape.*

water use and maintenance.

Bluegrass is the standard for comparing other grasses. Comparisons of plant characteristics such as leaf texture and plant tolerances use bluegrass as a point of reference.

Bluegrass has surprising drought tolerance. If unirrigated, the grass will go brown but will resprout from the rhizomes or underground stems when favorable conditions return.

It is by these rhizomes that bluegrass forms the tight sod with which we are familiar. It responds well to irrigation, fertilization, and mowing. Newer varieties have increased resistance or tolerance to heat, drought, disease, wear, and compaction.

#### Smooth brome/tall fescue

Smooth brome and tall fescue have been used as a turf mix in an office

complex for at least six years in Denver. It is a cool season mix first created to reduce visible drought stress during summer months.

Smooth brome is a weak sod former and tall fescue is a bunch grass. Both of these grasses are widely used as pasture grasses in the Great Plains.

The leaf texture (width) is much coarser than bluegrass. However, unless bluegrass is planted adjacent to this mix, most people do not realize it is not bluegrass.

This mix offers better visual drought tolerance than bluegrass and when mowed only every two weeks can be used to delineate areas for aesthetic appeal. The seed costs, using an "old" variety of tall fescue, can be as little as one-half that of bluegrass.

#### Tall fescue

Tall fescue is sometimes considered to be a weedy grass that is difficult to control. The improved varieties have almost-bluegrass leaf width and when planted as a monoculture, a tall fescue lawn is beautiful.

Some recommend this cool season grass as a method to reduce maintenance by mowing every two weeks to a height of four inches.

Researchers at the University of

Nebraska have extensive plots mowed at both one and two inches and both look great.

According to Dr. Terry Riordan (University of Nebraska), if a grass can maintain turf quality at one- and two-inch mowing heights, it will also be acceptable under less intensive maintenance schedules.

Tall fescue has a higher water use rate than bluegrass. Its drought tolerance is tied to its four foot deep root system, enabling it to tap a large soil volume for moisture. This grass is now available as sod in several states including Colorado, California, Texas, and New Mexico.

The seed is fairly large and seeding rates range from four to 10 pounds per 1,000 sq. ft. By postponing fertilization until early June after the natural flush of growth, excessive growth can be reduced.

#### The wheatgrasses

There are several wheatgrasses with turf potential. The two most promising at this time are western and crested or fairway wheatgrass. Both these wheatgrasses will tolerate precipitation as low as 14 inches per year, which can influence the amount of supplemental irrigation applied in season.

Western wheatgrass is a native sod forming grass. The aggressiveness of the rhizomes of this grass, as with most grasses, is related to the available water and nutrients. It is closely related to quackgrass (*Elytrigia repens*, was *Agropyron repens*). Most western wheatgrass has a bluish tinge to the foliage which can give an added visual feature in the landscape.

Emergence of the seed can be expected in two to three weeks, a rate that is a little slower than bluegrass. This should be considered when including this grass in a mix because western wheatgrass may not be visible the first season due to competition from the other germinating grasses.

Fairway wheatgrass is a selection from the crested wheatgrass complex. Fairway is leafier and shorter in height, making it the more suitable variety for turf use.

It is a cool season bunch grass and is one of the most widely used grasses for highway revegetation. The leaf texture is between bluegrass and tall fescue. Fairway wheatgrass responds well to irrigation, fertilization, and mowing and will prosper in a pure stand or in a mix.

#### Bermudagrass

Now what about warm season grasses? (Table 2) A problem with warm season grasses used in urban



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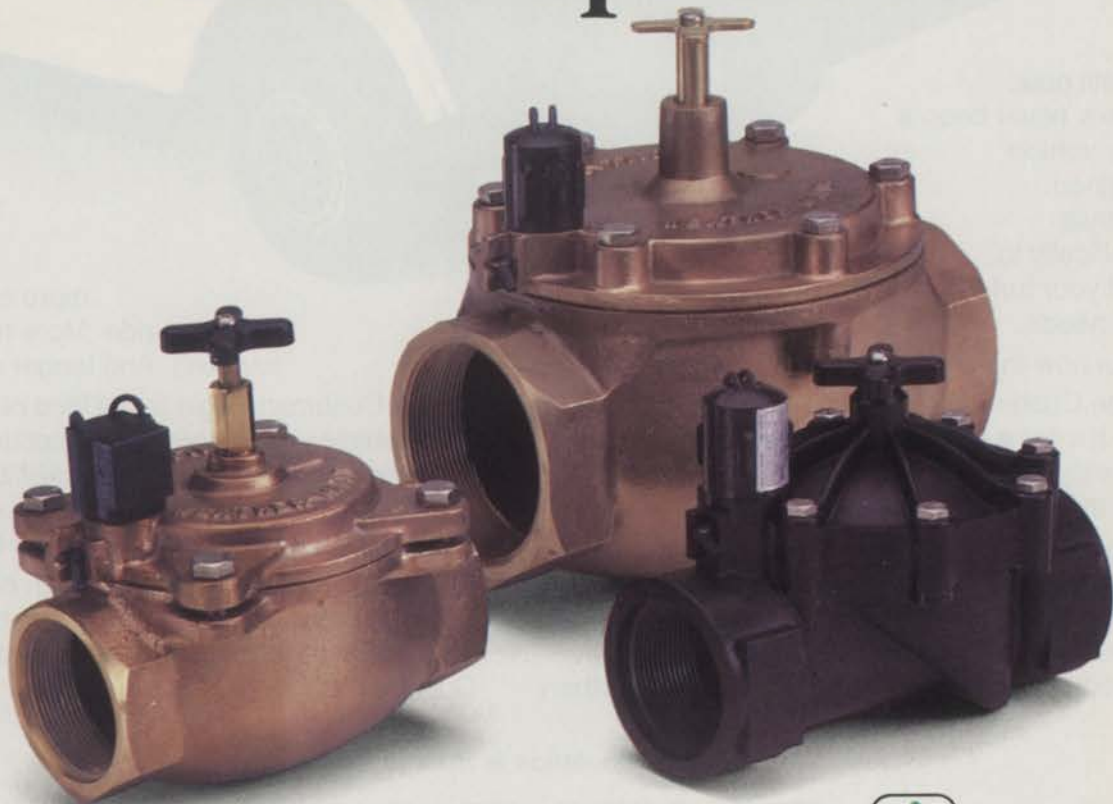
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areas is their lack of shade tolerance. In shady areas, weedy cool season grasses may invade and dominate over time.

Bermudagrass is a familiar grass in many sections of the country. The bermudagrasses that seem to have the most potential for "dryland" turf are the locally-adapted varieties. In northern Colorado, some say the hybrid, improved bermudagrass varieties do not have the needed winter hardiness to survive.

This grass has great characteristics as a low water and maintenance turfgrass. It is a warm season grass

---

*...reducing water use  
will actually reduce  
maintenance needs,  
resulting in savings of  
water, time, and money.*

---

with aggressive rhizomes and stolons and has excellent heat, drought, and salt tolerance.

However, the very characteristics that make bermudagrass attractive for low maintenance lawns also make it a terrible weed where it is not wanted.

In areas of southern and western Colorado, locally-adapted bermudagrass is the only grass that can tolerate the hot, dry, and sometimes salty (saline) conditions. Availability of seed and/or stolons is based on collections of the grass within an area.

### Buffalograss

This native warm season grass has been looked upon as the panacea for lawns in parts of the Great Plains. Around the turn of the century, buffalograss was widely used in the Midwest as a lawn grass.

Buffalograss and blue grama were found in associations over approximately 90 percent of the Great Plains. Obviously these grasses have the heat and drought tolerance to survive in our lawns.

Buffalograss spreads by stolons or above-ground runners. Its maximum height is six to eight inches which makes the grass attractive as a "no mow" lawn. It has both male and female plants and flowers. The male flowers extend above the foliage while the female flowers and seeds are nestled in the foliage, close to the ground.

Special seed harvesters and techniques are needed for buffalograss, increasing the cost of seed. The seeds are found inside burs, two to five

seeds per bur. By using treated seed, buffalograss will emerge in seven to 10 days with establishment irrigation.

### Blue grama

Also a native grass, blue grama has a familiar and attractive seedhead. It is a bunch grass and is often mixed with buffalograss for diversity and to reduce seed costs.

All eight grasses discussed here tolerate mowing at 2½-3 inches on a weekly basis, although less frequent mowings may be beneficial to the grass. They all respond to fertilization and irrigation and make an acceptable turf.

These grasses have been selected for examination in research plots because of their adaptations to a semi-arid climate and tolerance for increased moisture and other maintenance practices.

All organisms have pests, these "new" grasses included. As an industry, we don't know all the pests that might cause problems or which chemicals will work and which may burn the foliage.

Many pest outbreaks, especially diseases, can be prevented by maintaining a healthy stand of grass. Water for these alternative grasses is the key for reducing disease incidence just as it is for bluegrass.

When selecting a grass, be it bluegrass or another, develop long-term maintenance practices to match the needs of the grass.

Regardless of the grass selected, good horticulture practices such as soil preparation, proper placement of plants, well designed irrigation systems and appropriate irrigation schedules, and matched maintenance schedules will benefit the grass selected. The maintenance schedule should also show reduced costs through reduced maintenance and water used.

In some areas of the country, using other grasses is more critical now than in other areas. However, in all parts of the U.S., unless we can figure out how to supply the natural precipitation evenly throughout the year, there will be more interest and emphasis on lower water using plants. The green industry could suffer considerable damage if landscaping is forbidden or restricted as a method of conserving water.

We, as an industry, can prevent this by developing or introducing plant material better adapted to the climatic variations in our area and by working with municipalities to help educate the public on attractive water conserving landscaping techniques and options, before ordinances are enacted.

WT&T





Inverness Club superintendent Tom Walker is confident the "Hinkle Tree," the blue hills spruce directly behind him, will provide the barrier needed between the 8th and 17th holes.

## IDYLIC INVERNESS

Superintendent Tom Walker keeps his course, host of this year's PGA Championship, in superb shape with a 'light and frequent' maintenance program.

by Ken Kuhajda, managing editor

It doesn't look like much, the blue hills spruce that sits near the tee of the 8th hole. But it sure made Inverness Club in Toledo, Ohio, even more famous.

It's become known simply as the "Hinkle Tree," the 25-footer that golfer Lon Hinkle made famous at the 1979 U.S. Open.

During the opening round, Hinkle decided to take a short cut on the par 5, 528-yard, dogleg left 8th hole by hitting his tee shot through a narrow opening and into the parallel 17th fairway.

From the 17th fairway, the no. 8 green was reachable in two strokes.

may have been the only Open participant to realize that, and during the first round, he hit a one-iron and two-iron, and then two-putted for birdie.

Word spread and two other golfers birdied the hole. The next day, golfers were surprised to see the scraggly blue hills spruce in the slight gap Hinkle had hit through.

On Friday, Hinkle was unaffected by the tree. He hit his driver over the Hinkle Tree and into the 17th fairway for another birdie.

Superintendent Tom Walker and tournament officials are hoping the same thing won't happen this year when Inverness hosts the PGA Championship Aug. 4-10. The tree is several feet taller, and the woods between the 8th and 17th holes has grown considerably more dense.

The Hinkle Tree has added to the legend of 83-year-old Inverness, host of four U.S. Opens (1920, 1931, 1957, 1979), one U.S. Amateur (1973), and a PGA Championship (1986).

### Maintenance tricks

Walker tends a course that exhibits common northern characteristics: bentgrass tees and greens, bentgrass and poa annua fairways, and a bluegrass/tall fescue mix in the roughs. He says that only subtle changes are being made in preparation for the PGA.

The course has 94 sand traps, some of which are bordered by yarrow, a noxious weed that Walker lets grow and then uses to his advantage.

Hundreds of varieties of trees dot the course, some of which were gifts from members. "We have a membership who loves their trees. We try to bring in some different trees for them," says Walker, pointing to a fern leaf beech.

A paperbark maple in the 9th fairway is a gift from a doctor



Number 18 at 354 yards is probably the shortest finishing hole on a major U.S. course. But the tiny green, bunkered front and left, slopes to the right and back, thus creating a challenge even for the pros.





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## LANDSCAPE PROFILE



Inverness employee Eric Malczewski mows a narrow strip of turf in the U-shaped sand trap that sits in the fairway between holes 14 and 15.



Jay Collins is all eyes as he mows tees to just under 1/4-inch.

member, says Walker. "We have more than 10,000 trees."

Inverness has its own nursery of sorts but it is temporarily uprooted in preparation for the PGA. It lost a territorial battle to the press tent. Walker says trees generally grow four to five years before they are planted on the course.

### 'Lightly and frequently'

In maintaining the trees and turf, Walker says he has no tricks. But after talking with him, it's evident that his maintenance program should be labeled "lightly and frequently."

The trees are frequently pruned

by Inverness staff.

He uses a low nitrogen program, fertilizing lightly and frequently (every two weeks). He feeds his turf a lot of potassium.

He aerifies the greens in the spring and fall, the fairways in the spring and sometimes in the fall, and the tees continuously in the summer months.

He topdresses the greens lightly every two weeks.

In addition, he verticuts frequently, using a Toro riding greensmower. "It helps speed up the greens but certainly doesn't help with thatch," says Walker.

He mows his tees at just below 1/4

inch, the fairways at just below 1 inch, and the greens at just under 1/8 inch. The rough is kept at anywhere from 1 to 4 inches.

### Strong support

With all his maintenance activity, Walker needs both a big and capable crew. He's lucky. He has both.

About 30 workers toil the turf at Inverness (mainly with Toro and some Jacobsen equipment), with just

*'We have a membership who loves their trees. We try to bring in some different trees for them.'*

—Tom Walker, superintendent  
Inverness Club  
Toledo, Ohio

five remaining year-round. Walker repeatedly points out his crew's talent.

"I'd put this crew up against any in the country," says Walker. He adds there's something special, an added incentive, when preparing for a major tournament.

"Something like the PGA pulls them together. They realize it's a once-in-a-lifetime event and they get to participate in it," he says.

The crew is an interesting bunch. Assistant superintendent Tim Kennelly, 23, already has eight years golf course experience. He has an associate degree of turfgrass management from renowned Michigan State University.


The tall, blond Kennelly worked for Walker at Highland Meadows. He also worked two summers at famed Oakmont Country Club in Oakmont, Pa. The youthful Kennelly says he doesn't feel great pressure to perform.

"I don't think age is an issue. It's ability and experience," says Kennelly, who hopes to land his own superintendent's job after this year's PGA.

Kennelly says he knew he wanted to be a golf course superintendent by his sophomore year in high school.

Crew member Aaron Asmus aspires to land an irrigation construction job in Florida when he graduates from the Agricultural Technical Institute (a part of Ohio State University) in Wooster, Ohio.





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Walker allows the noxious weed yarrow (some varieties are known as Queen Anne's Lace) to grow free in the traps, creating an ornamental look.

A member of a religious singing group, summer helper Asmus will graduate in the spring, 1987 with an associate degree of applied science in turfgrass management.

Fellow crew member Chase Clements Jr. has a well-known name in the Toledo area. His father, Chase Clements Sr., is a columnist for the local *Toledo Blade* newspaper. Chase Jr. is also an aspiring writer.

**A long career**

Walker, in his sixth year, is preparing for his first major tournament. That's something special for a man who began raking bunkers at Inverness when he was 14.

When former superintendent Wilbert Waters retired in 1980, his understudy Walker came back to Dorr Street (Inverness' location in southwest Toledo) to fulfill his dream.

"I'm really proud of this course," says the 35-year-old. "Being the superintendent here is something I've always wanted to do."

Walker, with an agronomy degree from Ohio State University, has also worked at Muirfield Village Golf Club (Dublin, Ohio), Kettering Country Club (Defiance, Ohio), and Highland Meadows (Sylvania, Ohio).

**Inverness, 1986 style**

When Inverness hosted its first U.S. Open in 1920, contestants were housed at five downtown hotels and paid rates ranging from \$1.50 to \$5 per night. They'll pay a little more this year.

And the course they'll play has also changed substantially.

In 1979, four new holes were added to relieve congestion and

accommodate today's galleries. Numbers 3 (par 3, 185 yards), 5 (par 4, 401 yards), 6 (par 3, 220 yards), and 8 (par 5, 528 yards) were added for the 1979 U.S. Open.

The battle still rages between traditionalists and progressives about the additions. However, the PGA press kit notes: "...as the new holes mature and the memory of those eliminated fades, the furor has somewhat subsided. Most of

*'Something like the PGA pulls (the crew) together. They realize it's a once in a lifetime event and they get to participate in it.'*

—Tom Walker

Inverness is still pure Donald Ross (the original architect)."

The course measures 6,982 yards with a par of 71.

There's no arguing over the fact that Inverness is well-respected and highly-rated in the golf world. *Golf Digest* ranked Inverness 55th among the nation's top 100 golf courses in 1985.

**Back to normal**

Walker and crew admit there's something special about preparing for a major golf tournament. But when the last hot dog wrapper is vacuumed after the PGA, Inverness will return to serenity with its 220 members at center stage.

That's fine for Walker, who knows success begins and ends with your members. "Our members care about this course as much as we do," says Walker, who prefers to stay behind the scenes.

Walker believes he and the crew are doing their jobs when they don't hear from the members. "Few know where my building is but if we have to shut the course down on a wet day, I'll be in the men's grill going from table to table explaining to them what we're doing," says Walker.

It could be that kind of attitude that makes Inverness a great place to belong and one of America's top courses. **WT&T**

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## Emergency access roads can be attractive; porous pavement is cost-effective solution

The \$80 million Ritz-Carlton Hotel in Laguna Niguel, Calif., and the Trammel Crow Company's 14.6-acre business park (Clauset Centre in Costa Mesa, Calif.) needed something more aesthetically pleasing than concrete when it came to installing emergency access roads. So Sullivan Concrete Textures of Costa Mesa was selected to install Grasscrete for the resort's poolside and the business park's subterranean parking structure rooftop.

Grasscrete, a Bomanite process product of structurally sound porous pavement, has recently become dramatically more cost-effective.

In the past, the cast-in-place monolithic continuously reinforced grass and concrete pavement had been installed using plastic forms which were melted away during the construction process. A new installation technique developed by Bomanite Corp. uses special forms which can be withdrawn and used again. The result is a large reduction of material and labor costs which allows Grasscrete to

be priced competitively with pre-cast grass and concrete products.

The Ritz-Carlton Hotel installed Grasscrete in two courtyards. The hotel frequently uses the area for barbecues which poses a fire threat.

"Because of an Orange County

stipulation, we had to have fire truck access," explains Kevin O'Keefe, the Ritz-Carlton's director of landscaping. "Grasscrete was the only option we had in lieu of concrete or asphalt."

O'Keefe says the bluegrass/fescue *continued on page 58*



The Clauset Centre in Costa Mesa, Calif, where Sullivan Concrete Textures of Costa Mesa performed the installation.

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Join the rapidly growing number who select Tall Fescue for:

- rich, dark green dense turf
- low maintenance
- soil and climate adaptability
- tolerance to shade and cold



- tolerance to heat and drought
- resistance to disease
- durability and longer wear
- year-round beauty and performance

*Oregon Turf Type Tall Fescue has all the superior qualities you want and need: beauty and rugged stability. Demand the perfect choice for low maintenance turf, ideal for playing fields, parks, home lawns, airfields, roadways, industrial and commercial sites and more.*

For more information  
contact your seed dealer, or write to:

**OREGON TALL FESCUE COMMISSION**  
2140 Turner Rd. SE., Salem, Oregon 97302  
Phone (503) 585-1157



# MUSTANG

## THE TALL FESCUE THAT LOOKS LIKE BLUEGRASS

KENTUCKY BLUEGRASS

MUSTANG TURF-TYPE TALL FESCUE

### BLUEGRASS QUALITIES WITH TALL FESCUE PRACTICALITY

You'll quickly notice Mustang's finer texture, rich dark green color and dense, uniform turf—and you'll understand why we say Mustang has bluegrass-like qualities.

But there's more to Mustang turf-type tall fescue than beauty; it's tough and durable. It's heat and drought tolerance, winter hardiness, and ability to endure low mowing heights are remarkable. Mustang even shows improved resistance to *Helminthosporium* netblotch and many other diseases.

Best of all, Mustang is practical, because it performs extremely well under low maintenance conditions like minimum fertilization, watering and mowing. National tests and actual applications in parks, golf courses and playing fields have proven it.



**DROUGHT TOLERANCE AFTER SEVEN WEEKS NO RAINFALL.**



KENTUCKY BLUEGRASS



K-31 TALL FESCUE

That's why Mustang is becoming the favorite choice of professional turf managers, over K-31 and many other commercially available varieties.

For bluegrass qualities and tall fescue practicality, use the professional's choice—Mustang turf-type tall fescue.

Pickseed also produces



and



and other fine turf grasses available nationwide from quality seed suppliers.

Produced by:

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# A Guide to Landscape Management

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**COOL-SEASON TURF/  
WARM-SEASON TURF**

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Your complete guide to  
herbicides and fungicides,  
designed with the  
turfgrass manager in mind  
and sponsored by  
Elanco Products Co.

**ELANCO**

Published exclusively by WEEDS TREES & TURF magazine as a 22-page supplement to its September issue, "A Guide to Landscape Management" promises to be a valuable reference you'll want to keep and refer to often.

The science of landscape management today is more planning ahead than reaction. With new technology, the landscape manager—nurseryman, golf course superintendent, landscape contractor, chemical lawn care applicator—must establish new standards by which to compare products.

"A Guide to Landscape Management" will help you more effectively select the right materials to make your job easier. A cooperative effort by the staff at Elanco and the editorial staff of WEEDS TREES & TURF, this special supplement will get you started toward beautiful landscapes.

Look for it in next month's issue of WEEDS TREES & TURF.

**WEEDS TREES & TURF**

**(HBJ)** A HARCOURT BRACE JOVANOVICH PUBLICATION



Rubigan is the best value for dollar spot, and it effectively controls fusarium blight, snow mold, stripe smut and is active on large brown patch when used with a Daconil 2787® tank mix.

Four years of field use show excellent control of dollar spot—even resistant dollar spot, at only 10-14 cents per 1,000 square feet per day of control.

For gradual reduction of *Poa annua* use cumulative rates of 2-3 oz./1,000 square feet

and proper management practices. With Rubigan, you can maintain disease-free *Poa* or gradually reduce it.

For more information, call your distributor or write:

Elanco Products Company  
A Division of Eli Lilly and Company  
Dept. E-455, Indianapolis, IN 46285, U.S.A.

Rubigan®—(fenarimol, Elanco Products Company)  
Daconil 2787®—(chlorothalonil, SDS Biotech Corporation)

Circle No. 107 on Reader Inquiry Card



# Rubigan® controls dollar spot on greens, tees and fairways.

And you get more for your dollar.





mix he uses covers the Grasscrete well. However, he suggests that turf varieties with stolons, such as bermudagrass and St. Augustinegrass, may provide a more advantageous cover.

O'Keefe treats the turf in the Grasscrete area similar to other areas on the property. "Depending on the exposure, it may need a little more water," he says. "We use a broadleaf and it reacts the same as with other turf. It's worked out super for us."

The only drawback O'Keefe foresees is the possibility of having to remove the

Grasscrete in order to fix the irrigation system underneath. "The area is so big that we have to have heads in the middle," he says.

Applications for Grasscrete include emergency vehicle access roads where aesthetics is a consideration, parking lots where stormwater runoff and/or aesthetics are considerations, and erosion control applications.

Grasscrete is installed by a nationwide network of specially-trained and equipped contractors licensed by the Bomanite Corp. **WT&T**



Grasscrete, "the only option in lieu of concrete or asphalt," as it looks installed at the Ritz-Carlton Hotel in Laguna Niguel, Calif.

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**For Victory Over Tough Turf Diseases**

- ★ Proven Effectiveness — Leaf Spot, Red Thread, Dollar Spot (even resistant strains!) & Pink Snow Mold.
- ★ Effectiveness = Economy — So little lasts so long!
- ★ NO FUNGI PROBLEMS = HAPPY CUSTOMERS

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**If you're not using Blazon®, you don't know what you're missing!**

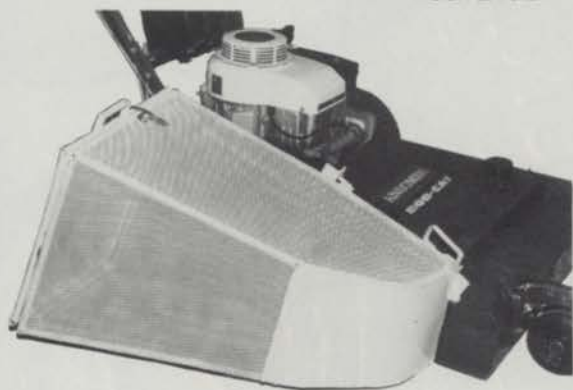
Contact Milliken Chemical for more information and the authorized Blazon® distributor in your area.

Milliken Chemical  
Division of Milliken & Co.  
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South Carolina 29349  
Telephone (800)845-8502 or (803)472-9041

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**Catchers Falling Apart? try GRASS GOBBLER!**

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- One-year warranty against breakage
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- Bracket fits: Bobcat®, Exmark®, Kees™, Bunton®, Toro®, John Deere®, Please specify.
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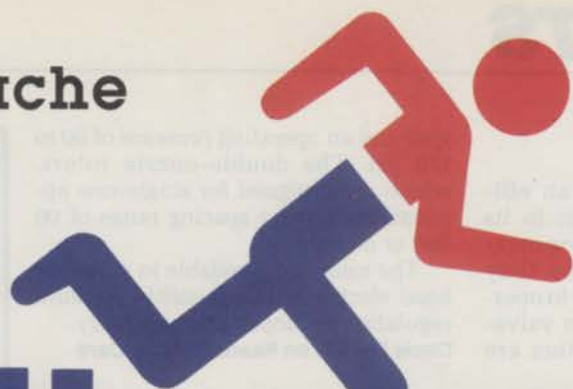
**Lawn-Wright, Inc.**

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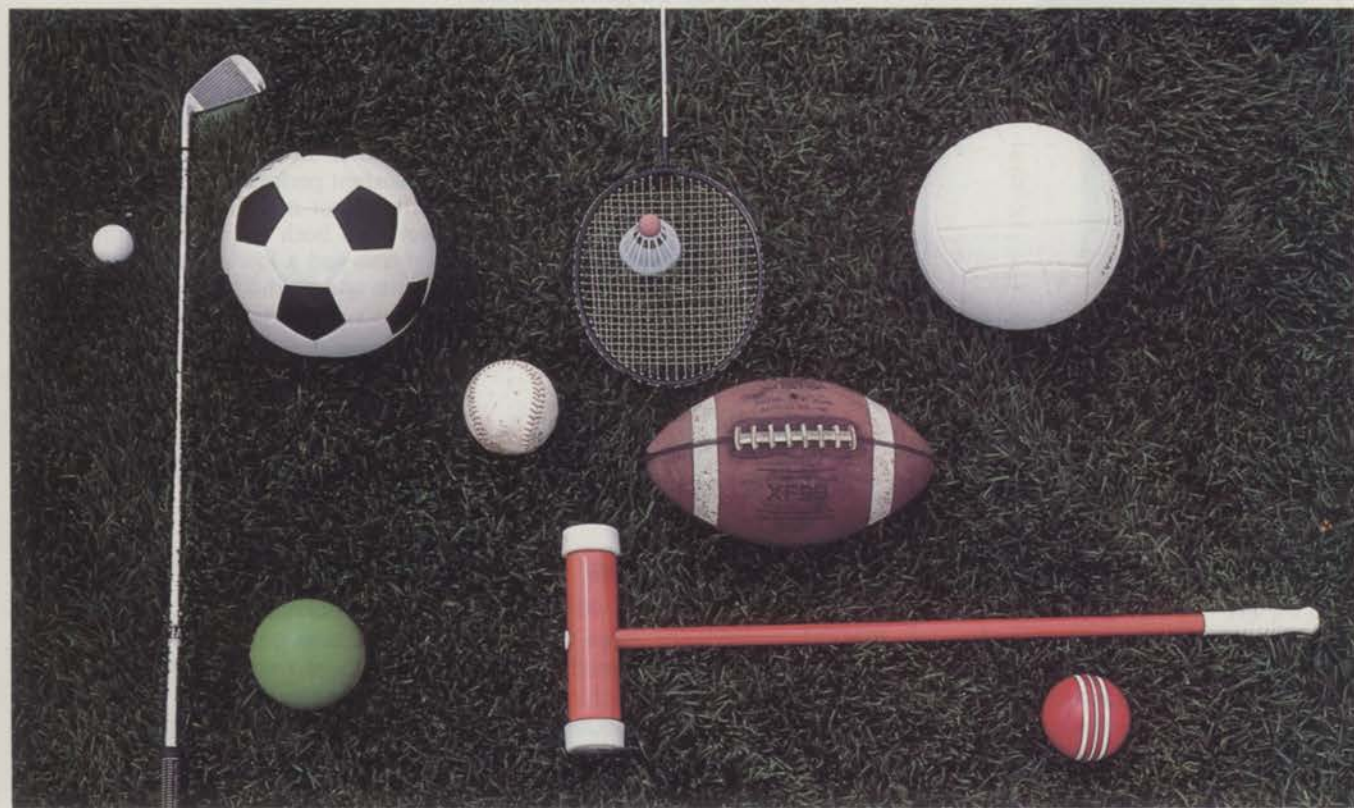
Olympic, Apache  
and Bonanza  
team up...

...for the  
1986  
Games!



# Triathalawn

Turf-Type Fescue Blend



Triathalawn turf plot, 5 weeks after planting, Hubbard, OR.

**This tall fescue  
blend brings you  
the best of  
all 3 varieties.**

Triathalawn turf-type blend is the best tall fescue seed available. Olympic has earned a reputation as hard wearing, finer leaved, drought tolerant turf variety. With the inclusion of the new generation Apache and Bonanza cultivars, Triathalawn combines the best of the old and new. Triathalawn promises to be the sports, park and home turf of tomorrow. Make Triathalawn a part of your plans *today!*

Triathalawn blend qualifies for  
Turf-Seed's Blue tag program. Ask  
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Triathalawn is produced and marketed by  
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503/981-9571 TWX 510-590-0957

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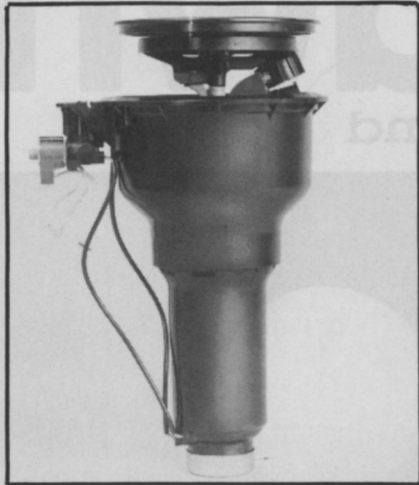


# PRODUCTS

## Rain Bird introduces pair of rotors

Rain Bird has incorporated an efficient diaphragm valve design in its new 91DR and 95DR rotors for maximum performance. Because they need less pressure and energy to operate than do traditional piston valve-operated rotors, the new rotors are more cost-efficient.

The full-circle 91DR and full or part-circle 95DR have a flow rate of 28 to 78



gpm and an operating pressure of 60 to 120 psi. The double-nozzle rotors, which are designed for single-row applications, have a spacing range of 90 feet or more.

The rotors are available in valve-in-head electric with adjustable pressure regulation or Stopamatic capability.

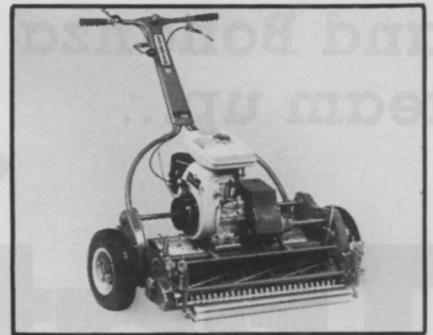
**Circle No. 190 on Reader Inquiry Card**

## Bunton greensmower cuts down on thatch

Bunton 22- and 26-inch walk-behind greensmowers are now being used by golf course superintendents for greens where thatching is a problem.

The mowers have a powered brush mounted between the front roller and the reel to lift the grass before it is clipped. Clippings are then deposited in a metal or plastic catcher.

The brush is easily adjusted to coincide with the pitch of the bed knife. The height can also be adjusted and it can be disengaged for mowing without the brush. An optional verticut attachment for thatching is also available, but seldom required because of the action of the rotary brush.



**Circle No. 191 on Reader Inquiry Card**

## Reel mower designed for use on compact tractors

Huxleys' TR66 hydraulic reel mower, developed in Alresford, Hampshire, Eng., can be easily and quickly attached to or removed from a compact tractor.

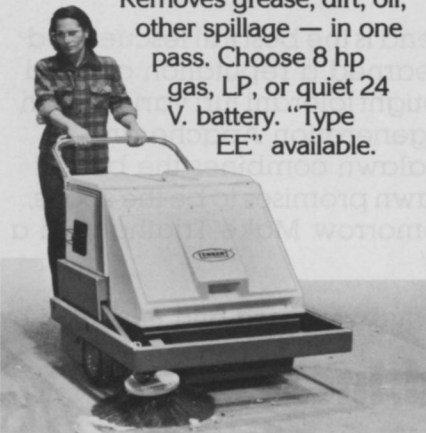
The reel mower features a fully-independent hydraulic drive system for consistent performance, three individually pivot-mounted reels for even work on both level and undulating ground, and a low all-up weight for a minimum ground pressure, maximum stability, and optimum weight distribu-

# Clean Fast, Save

## Tough sweeper scrubs

TENNANT® 186 sweeps 6 times faster than pushbrooms; covers 34" path, up to 18,000 square ft./hr. Heavy steel wraparound bumper; reinforcing throughout. Powerful brush/vacuum system for nearly 100% dust control. Converts to scrubber in minutes.

Removes grease, dirt, oil, other spillage — in one pass. Choose 8 hp gas, LP, or quiet 24 V. battery. "Type EE" available.



**Circle No. 150 on Reader Inquiry Card**

## Sweep tight areas

TENNANT® 215 cleans 46" path, 70,000 square ft./hr. More than 20 times faster than hand methods, 4 times faster than walk-behind models. Compact, maneuverable for cleaning congested areas. Excellent dust control. Multi-level hopper dump optional. 8 hp gas or LP engine or 36 V. battery power.



**Circle No. 151 on Reader Inquiry Card**

## Free catalog

shows complete line of sweepers, scrubbers, grime-removing scarifiers, floor finishes, finance plans, and productivity boosters.

**Circle No. 152**

on Reader Inquiry Card

Free demonstration: no obligation.



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# They are long, the days of splendor in the grass. But only if you make short work of the grubs.



Grubs. The spoilers. Once they move in, they'll make short work of your turf.

Take care of the grubs **before** they get a chance to do any damage with **OFTANOL 2** insecticide.

OFTANOL 2 applied after egg hatch and prior to visible damage, kills any existing grubs, and with its lasting residual power, it

makes sure they don't come back.

And OFTANOL 2 has no offensive odor.

For pre-damage control of turf-damaging insects, no other product is more effective or more economical than OFTANOL 2.

OFTANOL 2. Because the days of splendor in the grass were meant to be **long**. Always read the label before use.



Mobay Corporation  
Specialty Products Group  
Box 4913, Kansas City, Mo. 64120



**OFTANOL 2.**  
**IT STOPS THE SPOILERS.**

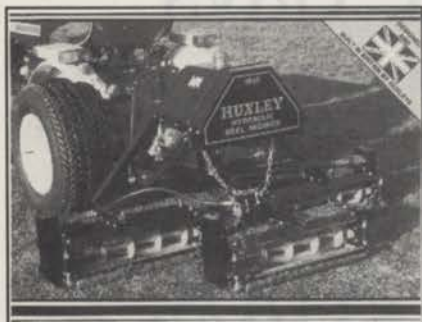
OFTANOL is a Reg. TM of the Parent Company of Farbenfabriken Bayer GmbH, Leverkusen.

Circle No. 127 on Reader Inquiry Card

AUGUST 1986/WEEDS TREES & TURF 61



tion on all grass areas.



Circle No. 192 on Reader Inquiry Card

### Weather monitor provides needed data

The Agri-Scribe is a low-cost, low-maintenance, easy-to-use weather monitor that automatically samples air temperature, relative humidity, leaf wetness, and rainfall each hour, according to the manufacturer, Reuter-Stokes Canada Ltd.

With its six-volt alkaline battery, the device stores the most recent two weeks of data in protected memory. The information can be retrieved either through the display

or with an optional printer.

The electronic Agri-Scribe replaces mechanical recorders as the environmental monitor for integrated pest management programs.



Circle No. 193 on Reader Inquiry Card

# NEW Arid

TURF TYPE TALL FESCUE

A nationwide progress report in 1984 of turf-type tall fescues placed Arid No. 1 in mean turf grass quality. Arid was tops in shade trials with greater disease and insect resistance. Finer leaves, rich, dark green color, low growing with deep roots to withstand high and low temperatures. Also good in humid transition zones.

An ideal sod former with little thatch makes Arid a new, refreshing choice with lower pesticide and fertilizer requirements.

Get complete information and order Arid from your seed wholesaler or sod distributor.

Another fine, quality-controlled product of

## Jacklin Seed Company

Circle No. 115 on Reader Inquiry Card

### Combo aerator/scarifier gives complete coverage

The Feldman Engineering & Manufacturing Company says its new walk-behind lawn aerator/soil scarifier is a durable, low maintenance, profit-producing product for the lawn maintenance service business.

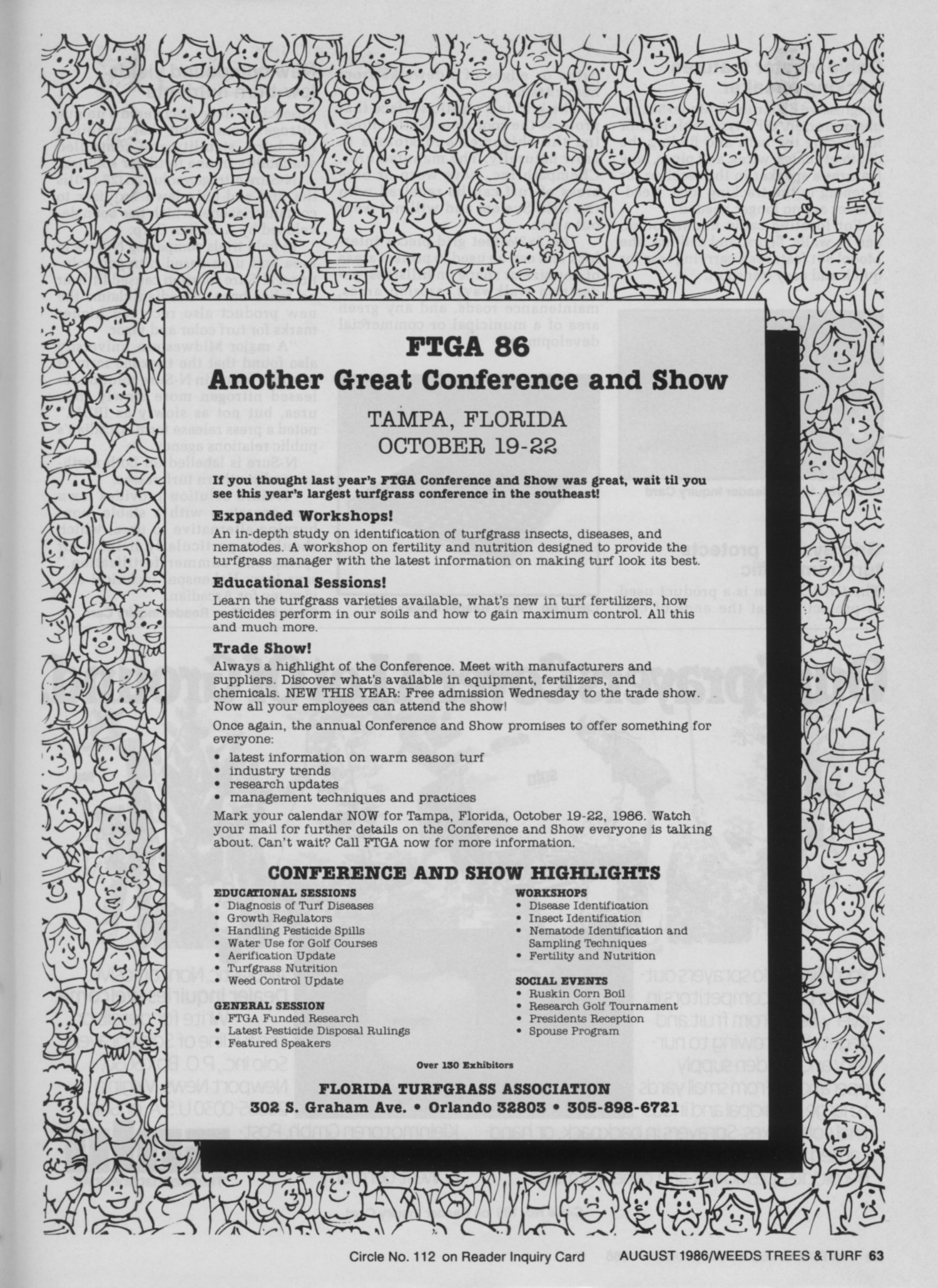
As an aerator, it will produce lush turf due to its comprehensive coverage, says the manufacturer. It produces a grid pattern of sliced sod with 2.5-inch centers and an aeration swath of 25 inches. Soil preparation for overseeding of bare sod areas is done quickly with independently rotating tines which propel the machine forward.

The lawn aerator/soil scarifier, at 102 pounds, is powered by a 2- or 3-hp engine and features chain drive, and a automatic single lever hand safety release clutch for forward and neutral.



Circle No. 194 on Reader Inquiry Card





## **FTGA 86**

# **Another Great Conference and Show**

**TAMPA, FLORIDA**  
**OCTOBER 19-22**

**If you thought last year's FTGA Conference and Show was great, wait til you see this year's largest turfgrass conference in the southeast!**

### **Expanded Workshops!**

An in-depth study on identification of turfgrass insects, diseases, and nematodes. A workshop on fertility and nutrition designed to provide the turfgrass manager with the latest information on making turf look its best.

### **Educational Sessions!**

Learn the turfgrass varieties available, what's new in turf fertilizers, how pesticides perform in our soils and how to gain maximum control. All this and much more.

### **Trade Show!**

Always a highlight of the Conference. Meet with manufacturers and suppliers. Discover what's available in equipment, fertilizers, and chemicals. **NEW THIS YEAR:** Free admission Wednesday to the trade show. Now all your employees can attend the show!

Once again, the annual Conference and Show promises to offer something for everyone:

- latest information on warm season turf
- industry trends
- research updates
- management techniques and practices

Mark your calendar NOW for Tampa, Florida, October 19-22, 1986. Watch your mail for further details on the Conference and Show everyone is talking about. Can't wait? Call FTGA now for more information.

## **CONFERENCE AND SHOW HIGHLIGHTS**

### **EDUCATIONAL SESSIONS**

- Diagnosis of Turf Diseases
- Growth Regulators
- Handling Pesticide Spills
- Water Use for Golf Courses
- Aeration Update
- Turfgrass Nutrition
- Weed Control Update

### **GENERAL SESSION**

- FTGA Funded Research
- Latest Pesticide Disposal Rulings
- Featured Speakers

### **WORKSHOPS**

- Disease Identification
- Insect Identification
- Nematode Identification and Sampling Techniques
- Fertility and Nutrition

### **SOCIAL EVENTS**

- Ruskin Corn Boil
- Research Golf Tournament
- Presidents Reception
- Spouse Program

Over 130 Exhibitors

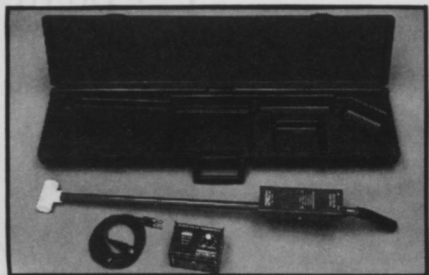
**FLORIDA TURFGRASS ASSOCIATION**  
**302 S. Graham Ave. • Orlando 32803 • 305-898-6721**



## Cable locator features tracking speaker

Progressive Electronic's Model 501 cable locator, an "RF"-type cable locator for tracing the path and finding the depth of cables, wires, and pipes, now features a speaker in the receiver for listening to the tracking tone. Headphones are no longer needed.

For locating cable underground, and in walls, floors, and ceilings, the Model 501 features a carrying case for quick and easy transport.



Circle No. 195 on Reader Inquiry Card

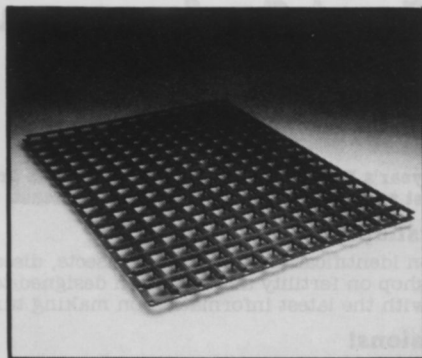
## Grid System protects turf from traffic

The Grid System is a product used to protect turf at the ends of cart

paths or edges of sidewalks from heavy traffic.

The grid is a plastic surface that protects the root zone while allowing the rhizomes and stolons to grow naturally. The manufacturer, Chempath Inc., says worn or bare areas of turf can be repaired with the Grid System and will not wear out again.

The 2x2½-foot grid pieces interlock and can be used to protect areas of any size or shape on hillsides, pedestrian walkways, erosion areas, maintenance roads, and any green area of a municipal or commercial development.



Circle No. 196 on Reader Inquiry Card

## New compound yields low-burn nutrients

Reseachers have discovered a unique nitrogen compound that combines low burn, stability and controlled availability in one fertilizer solution.

N-Sure nitrogen solution (28-0-0) is the first and only lawn fertilizer to contain triazone, which has been developed by Arcadian Corp.

In field trials comparing N-Sure to urea and urea-based nitrogen solutions, N-Sure solution caused little or no foliar burn. Arcadian claims the new product also received higher marks for turf color and vigor.

"A major Midwestern university also found that the triazone form of nitrogen found in N-Sure solution released nitrogen more slowly than urea, but not as slowly as IBDU," noted a press release from Arcadian's public relations agency.

N-Sure is labelled for both northern and southern turfgrasses.

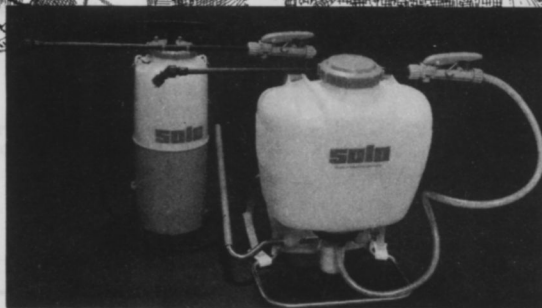
"N-Sure solution provides lawn care operators with a stable, non-burning alternative to urea, which should be particularly helpful for spring and summer fertilization," says Jerry Hakenson, technical service rep for Arcadian.

Circle No. 197 on Reader Inquiry Card

# Our Sprayers Cover A Lot Of Ground.



You'll find Solo sprayers outperforming competitors in every field. From fruit and vegetable growing to nursery and garden supply operations. From small yards to large municipal and industrial complexes. Sprayers in backpack, or hand-carried models are ideal for applying fertilizers, herbicides, pesticides, and other formulas.



All-plastic. Noncorrosive. Dealer inquiries welcome.

Write for details on the full line of Solo sprayers: Solo Inc., P.O. Box 5030, Newport News, Virginia 23605-0030 U.S.A. or Solo

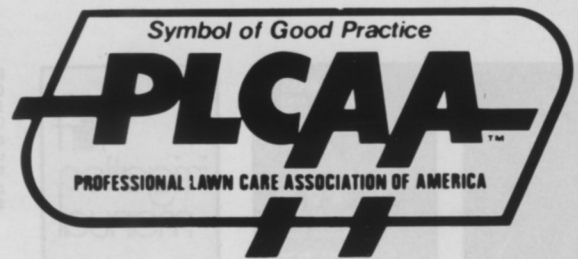
Kleinmotoren GmbH. Postfach 20, D-7032 Sindelfingen 6, West Germany.

**SOLO**<sup>®</sup>  
"The One That Does It All"

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# Over 1,000 companies have discovered the benefits of membership in the Professional Lawn Care Association of America.



## What are you waiting for?

Over 1,000 companies have joined the Professional Lawn Care Association of America since it was founded in 1979. Why? Because they know a good thing when they see it.

**Where else** can the small lawn care company get quality health care insurance at a reasonable cost? And where else can you get PLCAA's exclusive line of publications? PLCAA's Technical Resource Manual, the Safety Manual, and the Management Monograph booklets, our handy series of lawn care business guides, are all FREE to PLCAA members.

**How else** can you stay in touch with news you need to know? PLCAA members receive Turf Talks, our bimonthly newsletter, full of member news and management tips. PLCAA's Legal Update bulletin, written by General Legal Counsel Richard I. Lehr, is targeted to the green industry. And PLCAA's Environmental Update bulletin keeps members in touch with legislative issues — issues that could threaten your business.

**What else** do you get for your low PLCAA dues? Access and price breaks on local seminars, audio/visual training programs, sales aids, networking, and much more.

**Who else** but PLCAA offers all this to the lawn care businessman? Find out for yourself what 1,000 other companies already know — that membership in the Professional Lawn Care Association of America helps your industry and your business. Mail the coupon below or call (404) 977-5222.

P.S. — Don't forget to mark your calendar — **PLCAA/Baltimore '86**, our big 7th Annual Conference and Show, takes place Nov. 17-20, at the Baltimore Convention Center.

### I'm interested. Send me more information!

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# BOOKSTORE

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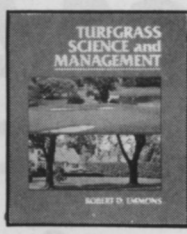
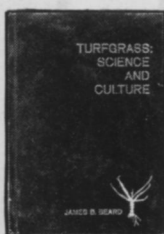
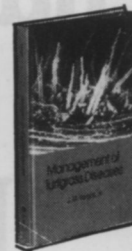
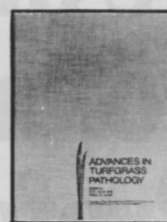
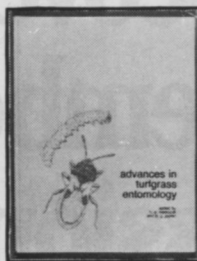
edited by Niemczyk and Joyner  
A complete account of the facts presented at the 1980 Symposium on Turfgrass Insects. 200 photographs, tables and graphs make this volume an indispensable reference for anyone connected with the turfgrass industry or research. **\$24.95**

## 010 - ADVANCES IN TURFGRASS PATHOLOGY

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

## 645 - MANAGEMENT OF TURFGRASS DISEASES

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Identifies turfgrass diseases by description and illustration. Includes a holistic approach to healthy turf and lawns. Presents practical management strategies for golf courses, lawns and athletic fields. 204 pages, illustrated. **\$26.70**



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A guidebook for engineers, architects, designers and contractors. Keeps pace with the latest developments in turf and landscape irrigation. Specific chapters devoted to rotary sprinkler design systems. Golf course design systems and expanded engineering and reference material. **\$23.95**

## 615 - TURF MANAGEMENT FOR GOLF COURSES

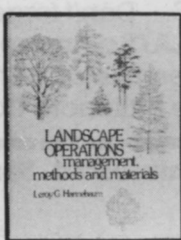
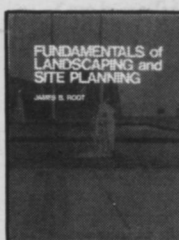
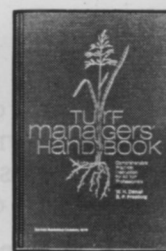
by James Beard  
Written by an eminent turfgrass researcher, this USGA sponsored text is an ideal reference and "how to" guide. Details all phases of golf course operations including course design and construction, turf management, course administration, irrigation, equipment and disease and pest control. Fully illustrated. **\$52.75**

## 620 - TURF MANAGEMENT HANDBOOK

by Howard Sprague  
Practical guide to turf care under both healthy and poor turf conditions. Chapters cover turf in cooler and warmer regions, fertilizer use, regular turf care, weed and disease control and special turf problems. Useful seasonal schedules for management of turf areas. **\$19.00**

## 110 - TURF MANAGER'S HANDBOOK

by Daniel and Freeborg  
This specially designed manual by leading turf specialists is a comprehensive, organized approach to turfgrass science and care. An easy, on-the-job reference for planning, purchasing, hiring, construction and plant selection. **\$28.95**



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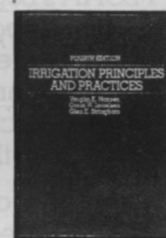
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An annotated photographic guide to the design qualities of ornamental plants and their aesthetic and functional use in landscape design. Over 600 trees, shrubs, vines, ground covers and turfgrasses are described in non-technical language. Over 1900 photographs. Provides a basis for selecting the best plant materials for any particular use in landscape design. Contains detailed indexes that provide quick reference to particular design qualities and growing conditions. **\$55.00**

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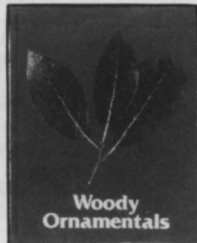
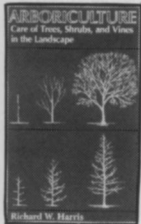
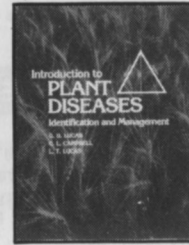
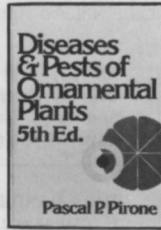
by *Pascal Pirone*  
This standard reference discusses diagnosis and treatment of diseases and organisms affecting nearly 500 varieties of ornamental plants grown outdoors, under glass or in the home. Easy to understand explanations of when and how to use the most effective fungicides, insecticides and other control methods. **\$32.50**

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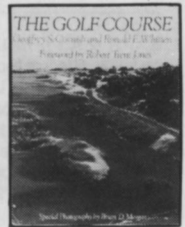
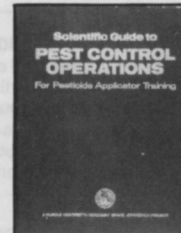
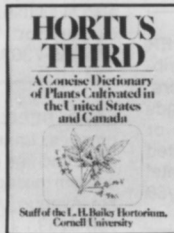
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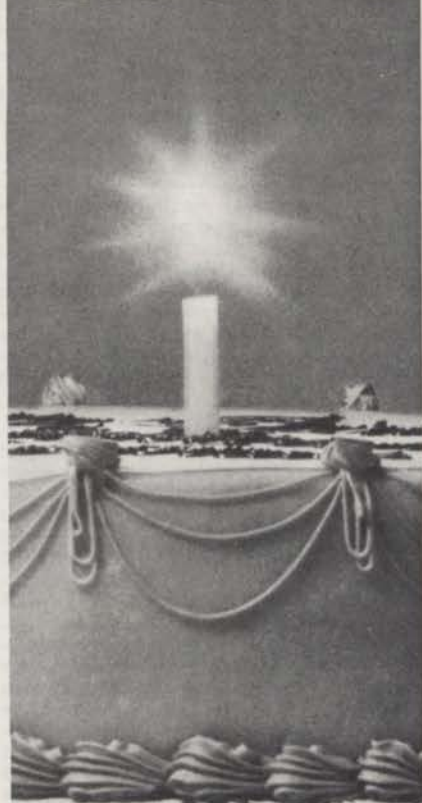
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## EVENTS

### August

**Northeast Ohio Nursery and Equipment Field Day, Aug. 12.** Lake County Nursery, Perry, Ohio. Contact Fred Buscher, OARDC, Wooster, OH, 44691. (216) 263-3831.

**American Horticultural Society annual meeting, Aug. 13-16,** San Francisco, Calif. Contact Sharon Barnes, AHS, PO Box 0105, Mount Vernon, VA, 22121. (703) 768-5700.

**Professional Lawn Care Association of America regional seminar, Aug. 14,** Lenexa (Kan.) Holiday Inn. Contact Doug Moody, PLCAA, 1225 Johnson Ferry Rd. NE, Suite B-220, Marietta, GA, 30067. (404) 977-5222.

**Penn State Turfgrass Field Days, August 14-15.** Joseph Valentine Memorial Turfgrass Research Center, University Park, Pa. Contact Dr. Joseph M. Duich at (814) 865-9853 or Christine E. King, Pennsylvania Turfgrass Council, (814) 355-8010.

**Landscapers Expo 1986, August 22-24.** Manatee Civic Center, Palmetto, Fla. Contact Merchandise World Inc., P.O. Box 1374-W, Venice, FL 34284; (813) 485-5888.

**Southwest Outdoor Power Equipment & Lawn/Garden Market, August 22-24.** Amon G. Carter Exhibit Hall, Ft. Worth, Texas. For information call or write Southwest Outdoor Power Equipment & Lawn/Garden Market, 4629 Mark IV Parkway, Ft. Worth, TX 76106; (817) 625-5562.

### SEPTEMBER

**Ohio Turfgrass Research Field Day, Sept. 11.** Ohio State University, Columbus, Ohio. (614) 422-2601 for information.

**Florida Nursery and Allied Trades Show, Sept. 12-14.** Orange County Civic Center, Orlando, Fla. For more information, call or write: FNGA, 5401 Kirkman Rd., Suite 650, Orlando, FL 32819; (305) 345-8137.

**World Fertilizer Conference, Sept. 14-16.** San Francisco Hyatt Regency, San Francisco, Calif. Contact The Fertilizer Institute, 1015 18th St. NW, Washington, D.C., 20036.

**Virginia Tech Turfgrass Research Field Days, Sept. 16-17.** Blacksburg, Va. Contact J.R. Hall III; (703) 961-5797.

**Oklahoma Turfgrass Research Field Day, Sept. 20.** Oklahoma Turfgrass Research Center, one mile west of Oklahoma State University Campus, Stillwater, Okla. Contact Michael Kenna at (405) 624-5404 for information.

**International Garden and Leisure Exhibition (GLEE) Sept. 21-23.** National Exhibition Center, Birmingham, England. For information contact Inter Garden Promotions, 60 Claremont Rd., Surbiton, Surrey KT6 4RH England. Phone (390) 2211 1601. Telex: 291561.

**Wisconsin Counties Association Fourth Annual Products, Services and Equipment Exhibition, Sept. 21-23.** Paper Valley Hotel and Conference Center, 333 W. College Ave., Appleton, WI 54913.

**Society of Municipal Arborists 22nd meeting and trade show, Sept. 28-Oct. 1.** Marriott Pavilion, St. Louis, Mo. Contact Bruce Vawter, Society of Municipal Arborists, c/o Monsanto Corp., 800 N. Lindbergh P1A, St. Louis, MO 63137. Phone (314) 694-2394.



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## Giving the readers what they want

I never thought I'd agree with James Kilpatrick, the syndicated newspaper columnist, until his column appeared in the local paper the other day. Jim usually talks about what a guy Ronnie Reagan is or how bad the local paper in Sioux City, Iowa, butchered a headline.



This time Jim wrote about knowing your reader and told of a young reporter in South Carolina who, in her review of the movie "Cocoon," used the phrase "old f\_\_\_\_" to describe the old men in the movie. The word—certainly no stranger to most—denotes excessive gas. The cub reporter didn't know her conservative audience, didn't know readers would be offended, and consequently is now in the unemployment line.

We at WEEDS TREES & TURF don't want to join her. That's why we're taking an even more scrutinizing look at our audience (you) and what you want to see in the magazine.

We're a people-oriented magazine, out in the field at local shows and at national events. We will remain there but you may see less of the personality-type profiles in WT&T. Our Readex studies indicate the personality profiles are consistently the lowest-read of any feature stories. (Readex provides both editorial and advertising interest reports to clients like us.)

Other Readex reader surveys ask you what type of information you find most useful in the magazine. In the survey of the March 1986, issue, respondents gave multiple answers. Ninety-three percent said weed, fertilizer, disease, and insect guides are most useful. Another 65 percent said "how-to" articles are useful. The remainder: agronomic technical, 57 percent; products, 54 percent; news, 53 percent; advertisements, 50 percent; **personality profiles, 14 percent.**

The percentages, though based on just one issue, are consistent with our Readex scores dating to 1981. Of the 11 most highly read WT&T articles dating to 1981, five were guides and two were technical pieces. Personality profiles and some of our regular departments dominate the bottom half of the list.

The message is clear. You won't see a discontinuation of the personality profiles. We'll continue running them, but you'll see more information near the top of the story and in shorter form. Ideally, a reader will be able to glean the pertinent information he needs off the story's first page.

We will continue to bring you the guides and technical articles you say you want. But we'll keep our personality.

Ken Kuhajda, managing editor

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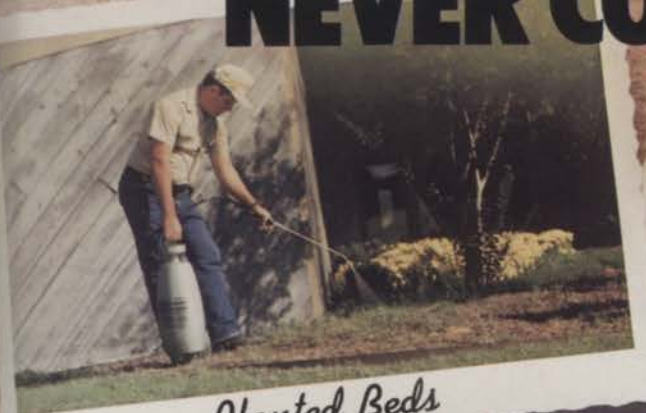


*Tree Rings*

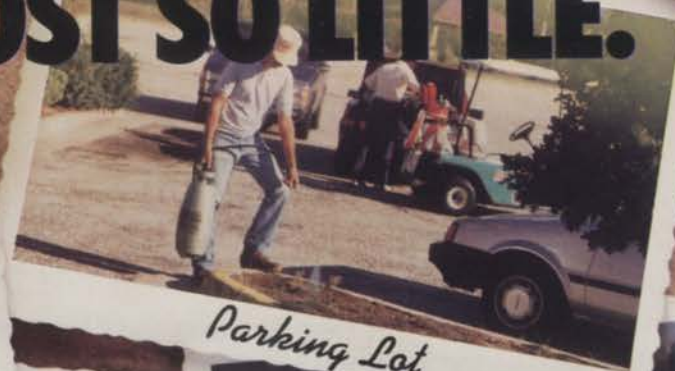


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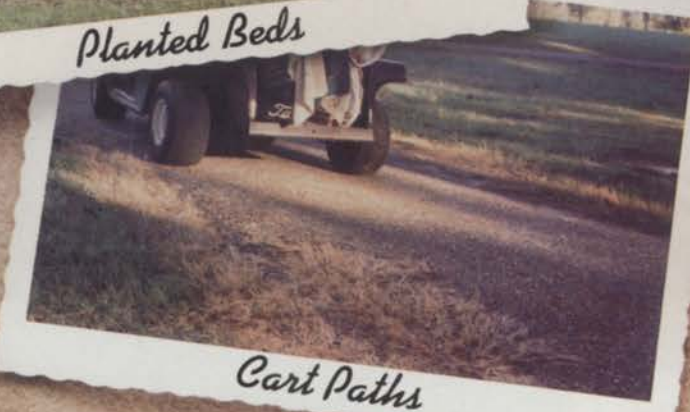
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Ed Burns, Athletic Director of Holy Spirit H.S. in Absecon, NJ, expresses his satisfaction to Lofts' John Morrissey.

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