

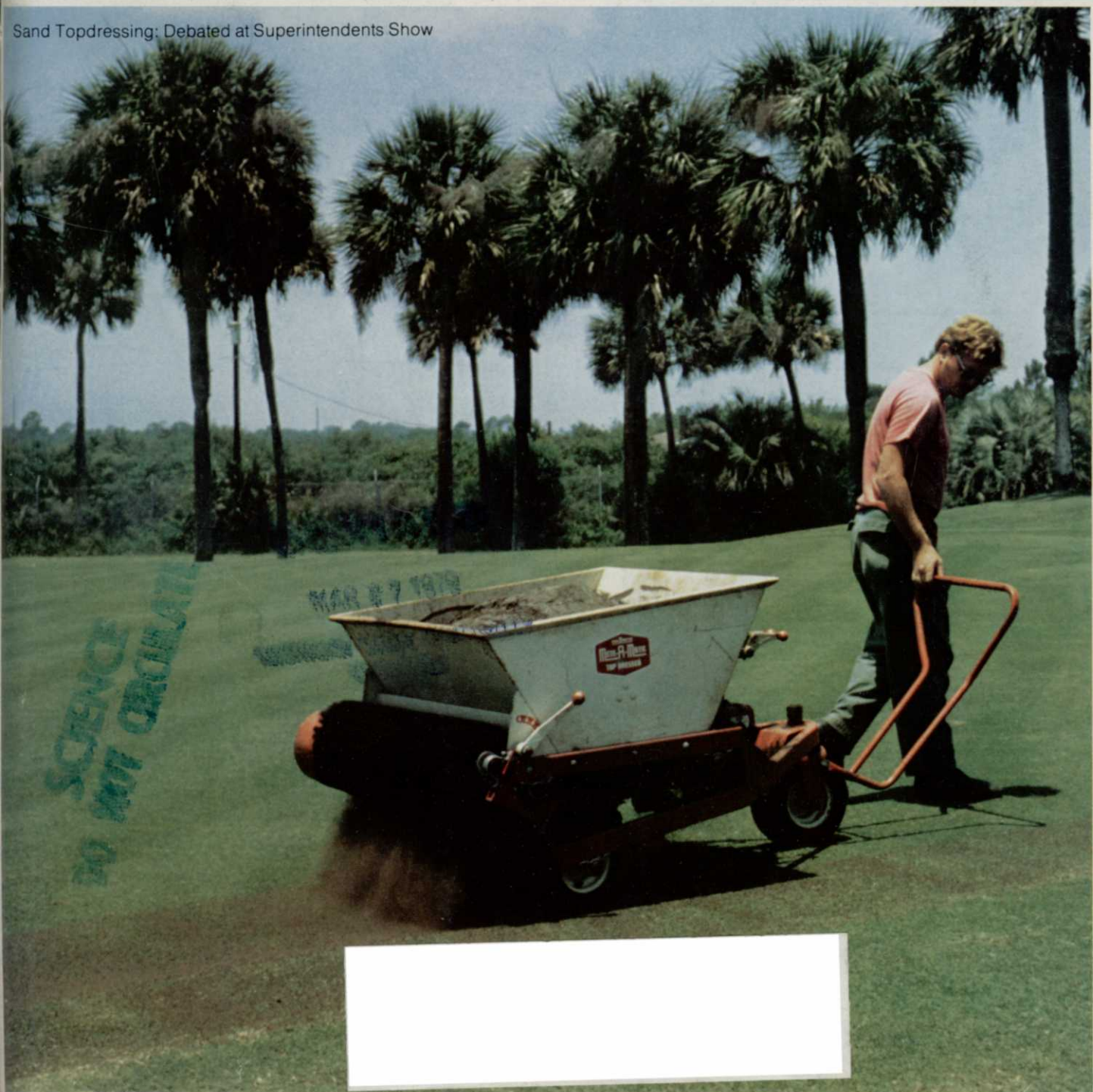
# WEEDS TREES & TURF

**Guidelines for Tank Mix Compatibility**

**Considerations for Use of Corrugated Drainage Tubing**

**Characteristics of Preemergent Herbicides**

Sand Topdressing: Debated at Superintendents Show



SCIENCE  
EDUCATION  
AND  
CAREER

**“I’m a customer  
and I have ideas, too!”**



You don't become the world leader in turf care equipment without paying attention to what people want.

So we listen to our customers. To our distributors. To people who buy our equipment. To people who service it. And to the people who go out under the hot sun and use it.

Then we design our products with new features. Make sensible improvements. And bring out new models.

All to be sure that every product we offer to you is made to match your needs.

And then we back our products with the kind of service and parts inventory to keep the equipment running like it should.

Next time you're ready to order turf care equipment, ask your Jacobsen distributor for his recommendation. And why.

The more you listen to what he has to say, the more you'll know we've been listening.

# We hear you.

**JACOBSEN**  
**TEXTRON**

Jacobsen Division of Textron Inc.

Circle 183 on free information card

# DIESELS FROM BOLENS.<sup>®</sup>

POWER YOU NEED  
FROM PEOPLE  
YOU KNOW.



24 hp. loader backhoe.

Match the work that you need done with the right Bolens Diesel, and you'll have a tractor that works when and where you need it.

To get the right Bolens Diesel, see your Bolens dealer. He'll suggest one that has the maneuverability and versatility that you need to get the job done. Day after day. Year after year. And if after all that dependable service something should go wrong, just give him a

call. He's been factory trained so he knows what makes a Bolens Diesel tick. And the parts are in-stock. Or available within 24-hours. And that minimizes downtime.

There are 4 Bolens Diesels ranging from 15 to 24 hp. Each is water-cooled, has multi-speed PTO, a 3-point hitch, and a choice of 2 or 4-wheel drive. Plus a variety of custom-matched, quick-change attachments. From mowers to snowthrowers and backhoes to front-end loaders. Or anything in-between.

The Bolens Diesel and the Bolens dealer. Equally capable. Equally dependable. See them today. For the name of the Bolens Diesel dealer nearest you, call 800-447-4700 toll-free anytime (in Illinois, call 800-322-4400). Or write the FMC Corporation, Port Washington, Wisconsin 53074.

**FMC**

© 1979 FMC Corporation

# CONTENTS

MARCH 1979/VOL. 18, NO. 3

**Bruce F. Shank**  
Editor

**Ron Morris**  
Technical Editor

**Robert Earley**  
Lawn Care Editor

**Scott Scredon**  
Reclamation Editor

**Dan Moreland**  
Assistant Editor

**Hugh Chronister**  
Publisher

**B. Krzys**  
Sr. Vice President

**Dayton Matlick**  
Sr. Vice President

**Charles Quindlen**  
Vice President

**Richard J.W. Foster**  
Publishing Director

**Richard Gore**  
National Sales Manager

**David J. Slaybaugh**  
Executive Editor

**Patricia Kelley**  
Production Manager



Copyright © 1979 by the Harvest Publishing Co., a subsidiary of Harcourt Brace Jovanovich, Inc. All rights reserved. No part of this publication may be transmitted or reproduced

in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the publisher. Address: 9800 Detroit Ave., Cleveland, Ohio 44102. Single copy price \$1.25 for current and back issues. Foreign \$1.50. Subscription in the U.S. and Canada are \$12.00 per year. \$15.00 in other countries. Foreign air mail optional at an additional \$24 per year. Controlled circulation postage paid at Cleveland, Ohio 44101. Postmaster: send form 3569.

Member: American Business Press, Business Publications Audit, National Golf Foundation, American Sod Producers Association, American Association of Nurserymen, Associated Landscape Contractors of America, National Landscape Association, Horticultural Research Institute.

Letters	6
Viewpoint	8

## GREEN INDUSTRY NEWS

Nursery Marketing Council to Test Promotion This Spring . . . Virginia Polytechnic Professor Receives Funding for Comprehensive Look at Elm Diseases . . . Major Changes Announced for Davey Tree Staff . . . Parks Meeting Set for Nashville 11

## FEATURES

### Corrugated Drainage Tubing Considerations

Drainage installation is simplified by the use of flexible corrugated tubing. Athletic field and golf green drainage designs are included. 16

### Pesticide Mixing Guidelines for Professional Applicators

Dr. Paul Sartoretto of W. A. Cleary Co. gives four basic rules to follow when mixing various pesticides together. 24

### Timing and Rate Critical With Preemergence Herbicides

Three leading turf specialists discuss important considerations for using preemergence herbicides. Discussion of thatch and goosegrass control is included. 39

### Scottish Greenkeepers Preserve Natural Challenge of Courses

An American superintendent's view of Scottish golf course maintenance during a trip to that country's historic courses. Many photos of Scotland's links area. 48

### National Meeting Report

Coverage of the Associated Landscape Contractors and Golf Course Superintendents Shows. 57

### Containerized Plants Play Major Role in Modern City

Century City, California, shows how landscaping can fit into a completely concrete environment with certain adaptations. 62

Vegetation Management	78
Proscape	84
Products	91
Classifieds	98
Events	106
Advertiser Information	106

**Cover:** Photo courtesy of Lake City Community College in Florida.



## LETTERS

**Parks face political problems**

I wish to comment on the article in January's publication of "Park Maintenance Begins With Design."

"YOU GET WHAT YOU PAY FOR"

is an old saying that I feel needs to be added to Professor Haskell's article in January's WEEDS, TREES & TURF.

During a portion of my professional career, while employed by consulting firms and self-employed, I have worked for and consulted with public agencies. Some agencies I dealt with employed under-qualified and unknowledgeable personnel who were responsible for giving important design criteria information to consultants. The agencies probably saved money in salaries, but ended up with a poorly designed project which was considerably over budget.

It seems some agencies hired consultants for political reasons, or hired consultants who would do the work for the least amount of compensation; again, this would promote poor design.

If public agencies are sincere about their project being competently designed, as Professor Haskell points out in his article, the agencies might start by hiring qualified personnel who in turn know good design from poor design, who are not placed in the position of retaining consultants for political reasons, and who have the background of experience to insure that the consultants do what is best for the agency — not what is best for the consultant.

"YOU PAY FOR WHAT YOU GET" both in professional "In-House" employees and consultants. You pay one way or the other.

John W. Davidson, ASLA  
Landscape Architect  
San Diego Unified School

**Message to landscapers**

At best, a landscaper is a farmer at heart, working with soil and nature, toiling nine or ten months of the year, working some twelve to fifteen hours a day, using much the same equipment. The main exception is that the landscaper has many more unknown factors to consider. Plant material availability is becoming a serious problem and, after locating and planting same, is subjected to damage by all extreme elements of the weather. One exception to the farmer is that much of the work has to be performed by hand using shovels and small hand tools. The landscaper has to have an intricate knowledge of plants, growing habits, soil conditions, diseases, and plant growing requirements. Quality of plant material varies and vigilant expertise has to be practiced at all times.

The landscaper assumes a great responsibility when he estimates a landscape project. In most instances he calculates that "normal" or "average" weather conditions will prevail during the growing period for the plants. This fallacy has cost much money in plant replacement.

In many respects a landscaper is much like a doctor . . . A doctor works on human birth, growth, illness and injury, and the degeneration of the body which is comparable to the nurseryman or landscaper who works with live plants. Plant propagation, early growth and care, plus threats from weather conditions, diseases, injury, insect devastation, ground composition, location, and changing conditions as to shade and water levels, constitute a formidable problem and challenge for the estimator. The landscaper takes on a tremendous responsibility in making his designs and plantings and, in most cases, assumes and hopes that everything will be favorable for his plant material to survive and properly grow according to the landscape plan. Unexpected weather conditions quickly change this possibility.

For the responsibility entailed in the foregoing paragraphs, it seems idiotic for a landscaper to charge or estimate low rates just for the sake of getting the job. Forgetting to include an adequate amount to compensate sufficiently for the expertise is non-professional. Not considering all expenses and costs and working for a wage much below a "sanitary engineer" or sweeper in a factory, with no vacations, medical benefits, or certainty of work, is also non-professional.

If we consider ourselves to be professionals and want to up-grade our industry, then let us start by doing professional work, start paying adequate wages commensurate with associated industry, and start charging realistic rates to compensate us properly for our knowledge, expertise, and endeavors.

Ohio Landscapers Association  
Stanley M. Lucas  
Publicity Chairman



NOW PLANT  
**Husky Young  
TREES**  
AT  
Wholesale Prices

Colorado Blue Spruce plus 26 other evergreen varieties; Black Walnut plus 28 other deciduous trees including many hardwoods. Ideal for forestation, windbreaks, wildlife shelter and food, soil conservation . . . increase property value. Low quantity prices.

Send for Free Catalog

**VANS PINES** INC.



Box 768, West Olive, Mich. 49460

Phone 616-399-1620

Circle 166 on free information card



**On the greens, the fairways...all around the links,  
inside the clubhouse and under all the sinks**

**DURSBAN 2E is the one insecticide that works.** DURSBAN® 2E Insecticide is ideal for broad spectrum, multi-purpose insect control everywhere around the club. Outside, DURSBAN 2E gives you unsurpassed control of turf pests like chinch bugs, sod webworms and cutworms, plus ticks, chiggers and mosquitoes. It even wipes out bagworms and many other ornamental plant pests. In-

side, it cleans up the toughest roach problems, and keeps working to rid your buildings and restaurant areas of insect pests. Ask your supplier about the one insecticide that really works, DURSBAN 2E. Just be sure to follow all the directions and precautions on the label. Agricultural Products Department, Midland, Michigan 48640.

DOW CHEMICAL U.S.A.

\*Trademark of The Dow Chemical Company





# lawn genie®

72" PTO Model

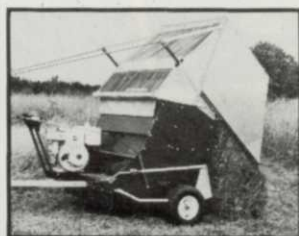


## The Pick-Up Mower

Mow smoothly and pick up clippings in one pass! The rugged, versatile Lawn Genie thatches lawns, verti-cuts greens, tees and fairways, sweeps leaves, wades through high weeds and empties easily from the tractor. It's the pick-up mower that cleans, mows and sweeps.



36", 60", 72" cutting widths - with or without loading hopper.



### Mathews Company

BOX 70, CRYSTAL LAKE, IL 60014, PHONE: 815-459-2210

Circle 129 on free information card

## Protect your investment in young trees with new

# GUARD-TEX® self-adhering tree-wrap

Field-tested, weather-proven GUARD-TEX® tape provides needed protection against splitting, sun scald, and freezing temperatures. Distinctive odor repels rodents and other gnawing or nibbling animals.

Easy-on, Easy-off GUARD-TEX® sticks only to itself, removes easily without leaving gummy residue.

Versatile GUARD-TEX® can be used for grafting and many nursery uses, including those shown below.



staking tomato plants



training climbing roses



espaliering trees and shrubs

Retail and Wholesale Nurserymen write on your letterhead for free trial roll and ordering information.

General Bandages, Inc. Dept. WTT-379  
8300 Lehigh Ave. • Morton Grove, Ill. 60053

Circle 143 on free information card

# WT&T

## VIEWPOINT

Bruce Shank, Editor

Every man and woman lives with the hope that each day's labor is a significant contribution to his profession and that years later those contributions will be recognized by family and associates. Without the feelings of worth and recognition man is incomplete.

The Green Industry, basically a second or third generation industry, falls short on recognition of its members when they step aside for the next generation. For the most part, commercial growth has taken place in golf, landscaping, tree maintenance, memorial park, and weed control since 1920. Those persons in their seventies started us on our way.

The Green Industry needs its own Hall of Fame, something of national scope based upon input from regional associations. In my opinion, such a collection of notables, should come from all segments of the Green Industry.

Trying to get cooperation from all groups within the Green Industry has been fairly difficult so far. The American Council for Turfgrass, formerly known as the National Turfgrass Federation, has not received the support needed to get off the ground, after two years of trying.

But what better reason to join together than to honor our best? How much disagreement could there be about the need to recognize persons who made our occupations what they are today?

Another indication that the Green Industry hasn't organized its methods of recognition, is the tough time our foundations are having getting the financial base necessary to support industry projects and research.

Foundations make a lot of sense. Through trusts a person can put otherwise lost estate taxes to work for the industry which supported him during his working life. There is nothing greedy or un-American about controlling the direction of your estate after death. I'll bet every senator and congressman has a trust fund.

Combine the need for recognition with industry support of research and development through trusts and you have one smart solution to both problems.

The younger generations can strive to be recognized as their predecessors were with the aid of new information derived through research supported by trusts and memorials.

I am currently aware of two foundations in this industry, the Musser and the Noer Foundations. If you would like more information about these foundations or think the Hall of Fame idea is sensible, let me hear from you.

We've got to do more to show our predecessors our gratitude. History is the foundation of every endeavor. It is the common link for the entire Green Industry. Honoring our predecessors has the effect of strengthening our foundation, giving all of us a sense of unity and worth.

It's time to quit thinking about patting our early leaders on the back, and do it.

WTT



# THE LITTLE TRACTOR THAT CUTS ANY WAY YOU LIKE IT.



At John Deere, we call the 850 and 950 our "little-big" tractors.

Because even though they're smaller and less expensive to buy and operate than many other tractors being used for parks, golf courses and other large-acreage mowing jobs, they've proven that they're more than big enough for the job. The 22-PTO-hp

850 and the 27-PTO-hp 950 have all the power you need to handle just about any kind of attachment. And both have versatile 8-speed transmissions that fit a wide range of jobs.

We offer 4 different mowing attachments alone: rear-mounted rotary cutter, flail mower, sickle-bar mower and center-mounted rotary mower.

So whether you're cutting fairways, roadsides, parks, pastures, ditches or whatever, we can match the attachment to the job.

We also offer a choice of tire sizes and styles. And your John Deere dealer is a man you can count on for parts, service and good advice.

See the John Deere 850 or 950 at your nearby dealer soon. Or, for free literature, write: John Deere, Dept. 63, Moline, Illinois 61265.



## THE JOHN DEERE "LITTLE-BIG" TRACTORS.

Nothing runs like a Deere.®



# GIVE MALLINCKRODT YOUR FUNGUS, WEEDS AND ROT, YOUR BROWN AND BARREN TURF.

**GET MEAN ABOUT GREEN  
WITH MALLINCKRODT'S VERSATILE  
TURF LINE.**

Green is what you want – from  
tee to green.

Mallinckrodt's line of proven turf  
products has the proven way to get it.

Whether you want broad spectrum  
control, or the solution to a specific  
problem, get tough about it with  
the just-right answer...

**FROM THE GREEN GROUP AT**

**Mallinckrodt**

MALLINCKRODT, INC.  
ST. LOUIS  
JERSEY CITY  
LOS ANGELES

Circle 104  
on free  
information  
card



# GREEN INDUSTRY NEWS

## NURSERY

### National marketing plan to have spring test

The Nursery Marketing Council has announced plans to begin testing its proposed national advertising campaign in specific markets this spring. According to Richard Hutton, chairman of NMC's Steering Committee, the marketing plan was developed by Ketchum, MacLeod & Grove, NMC's agency, in three initial steps.

"First, the creative team at KM&G took our original selling concept — 'A nice looking yard enhances the value of my property' — and translated it into actual advertising," explains Hutton. "Secondly, the media team established the most efficient ways to deliver that message to the largest number of our most likely prospective customers in the U.S. and Canada. And, finally, the research team devised ways all this can be tested to see what works best, and how the best efforts can be made to work even better."

Based on the sales message to be delivered and the anticipated budget available, the agency has advised NMC the wisest choice for advertising medium is radio. "We're talking about a 'nice looking yard,'" says Hutton. "If we try to show a picture of a nice looking yard in newspapers or magazines or on television, the one that will be right for one part of the country won't be right in another."

"But if we talk about a nice looking yard, every listener can visualize his own ideal in the 'theater of the mind.' And not only that," says Hutton, "the listeners can picture who will do the things necessary — someone in the family, a landscape firm, whoever. And picture where those purchases will be made — nursery, garden center, mailorder, wherever."

The media team at KM&G has developed a sophisticated procedure to schedule NMC radio



advertising once the campaign is in a fully operational year. The advertising has the potential of reaching everybody, but it is specifically targeted to single-dwelling homeowners aged 25 to 54, with a household income of \$15,000 and above, and at least a high school education. This target audience was deemed to be the most likely to increase their purchases of living plants, related products and services.

The advertising for the first going year will be concentrated in the period March through May. In order to get the greatest frequency, the advertising will be aired in two five- or six-week schedules during that time. According to accepted broadcast statistics, NMC's advertising is expected to reach over 75% of its target audience. Fifty-nine percent of the nursery industry's top prospects will hear the message two or more times in any given five or six week schedule; 38 percent will hear it six or more times in the same period.

In order to insure that the creative approach is accurate and that the media plan will be effective, the campaign will be "tested" before going national (international, including Canada).

Before actual testing begins, however, the Nursery Marketing Council's advertising concept and actual radio commercials will be "pre-tested." All through the month of February in two cities — Atlanta and Pittsburgh — a number of focus groups will be convened to hear the NMC radio spots. Each will be made up of owners of single-family

detached dwellings; half will be male, half female. After each commercial has been played, the listeners will answer a long and detailed questionnaire devised to learn just what and how much they got from the advertising, and all the subtle feelings they may have about it.

"We already know we have the strongest possible selling concept — 'a nice looking yard enhances the value of my property' —" says NMC spokesman Hutton. "Our nine months of research last year told us that. But now we will know if our advertising expresses that concept properly. If it sells. We will know what is strongest in our commercials. What is weakest. What to do to make them better."

Full details on the Nursery Marketing Council, the research which has been accomplished, the marketing plans, funding, etc., may be obtained by writing NMC, 230 Southern Building, Washington, DC 20005.

## TREES

### USDA funds study of elm diseases

Jay Stipes, a professor of plant pathology at the Virginia Polytechnical Institute and State University, Blacksburg, Va., has been awarded a \$69,500 grant from the United States Department of Agriculture to prepare and publish a "Compendium of Elm Diseases."

Working with him as co-editor will be Richard Campana, a professor of forest pathology at the University of Maine, Orono, Maine. Contributions from plant pathologists in Europe and North America will also be included.

The compendium will contain an evaluation of all known diseases of

elms and certain diseases of other trees in the elm family.

Stipes has specialized in Dutch Elm disease research in the Midwest and South for 16 years and is best known for his work in chemotherapy for disease control.

Campana has specialized in Dutch Elm disease research in the Midwest, Northeast, and California for 27 years and is best known for his work regarding development and control of diseases in urban elms.

## TURF

### Southern California institute set for April

The Southern California Turfgrass Council recently announced the dates and locations of the 1979 Spring Turf & Landscape Institute and the annual Turfgrass/Landscape Equipment & Materials Educational Exposition.

The institute, co-sponsored by the council and the University of California Cooperative Extension, will be held April 18 and 19 at the Anaheim Convention Center. The theme of the show is "Economics and Maintenance."

Cost for two-day registration which will include institute attendance, two luncheons, and an evening banquet is \$37 per person. Basic registration (no meals) is \$15 and student fee is \$5.

Registration information can be obtained from Ed McNeill, 1000 Concha St., Altadena, Calif. 91001 or call (213) 798-1715.

The educational exposition, also sponsored by the council, will be held October 17 and 18 at the Orange County Fairgrounds in Costa Mesa, Calif.

## EROSION CONTROL

### National laboratory set for Purdue site

Construction of a \$3.6 million National Soil Erosion Laboratory at Purdue University, West Lafayette, Ind., should be underway by next summer, according to a U.S. Department of Agriculture spokesman.

Earl R. Glover, acting regional administrator for agricultural research of the department's Science and Education Administration (SEA), said the laboratory should be ready for occupancy by late 1980 or early 1981.

Construction funds were included in the agricultural appropriations bill approved by Congress and signed by President Carter in October.

The two-story building will provide space for about 15 SEA agricultural research scientists and 22 staff personnel. "There also will be space for cooperating Purdue research and teaching staff as well as graduate students and visiting scientists," Glover said. Building plans are currently in the preliminary design stage.

## PARKS

### Opryland is site of fall institute

The Ninth Annual National Institute on Park and Grounds Management will be held Oct. 28-Nov. 2 at the Opryland Hotel in Nashville, Tenn.

The institute is open to all park and grounds managers. Program topics will cover management, operations and maintenance, along with

updates on technical information. Concurrent sessions are scheduled for both parks and campuses.

Scheduled for the same dates at the Opryland Hotel is the National Turf Management Conference, a national meeting for all non-golf turf managers.

Leading experts will present a variety of programs on all phases of turf at the conference. On-site tours of park and campus operations in the Nashville area will also be presented. For further information contact the National Institute, Box 1936, Appleton, WI 54913.

## MANAGEMENT

### Davey Tree announces 11 officer changes

The Davey Tree Expert Co. has announced that 11 changes in top management have been made, including the retirement of Alexander M. Smith as chairman of the board and chief executive officer at the company's Kent headquarters.

The company's board of directors recently approved the election of Martin L. Davey, Jr., former company president and vice chairman of the board, to chairman of the board, Jack W. Joy, president and chief operating officer, to president and chief executive officer, and Howard L. Eckel, Jr., vice president of utility services, to senior vice president of operations.

Others elected include Dr. Roger C. Funk, from director of research and development, to vice president of research and development and Donald J. Shope, from sales manager, tree care services, to vice president of tree care services. Although Smith will retire he will continue as a member of the board of directors.

Those named to additional vice presidential positions include James H. Pohl, senior vice president, to executive vice president, Bert D. Stamp, vice president of field services, to senior vice president of field services, Ted A. Baer, from vice president of tree care services, to vice president and assistant to the president, R. Douglas Cowan, from controller, to vice president of finance, and William F. Heim, from utility sales manager, to vice president of utility services.

*Continues on page 14*

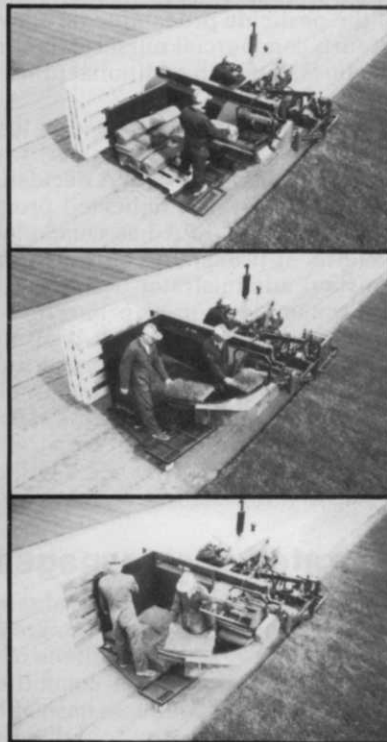


**New Davey Tree Vice-Presidents** (left to right) Donald Shope, tree care services; Howard Eckel Jr., operations; and Roger Funk, research and development.

# VERSATILITY

## JUST ONE OF THE REASONS BROUWER OUTSELLS ITS COMPETITION 8 TO 1

- The BROUWER Sod Harvester does it all — ROLLS, SLABS or FOLDS in widths of 15", 16", 18" or 24".
- Cuts in ALL SEASONS, ALL GRASSES, ALL CONDITIONS — wet, dry, hard, soft, rough and even weak sod, day or night, rain or shine.
- Small Tractor, SPEED, MANEUVERABILITY and TIGHT TURNING CIRCLE provides efficient operation in even small fields.
- CHOICE OF PALLET SIZES from 36" to 60".
- SIMPLE DEPTH ADJUSTMENT provides for the most uniform cut even at minimum thickness.
- SIMPLE, ADJUSTABLE CUT-OFF produces consistently clean, square cuts.
- REDUCED FIELD WASTE and NO TURF DAMAGE. Operates off the turf, follows field contours and cuts to fences, irrigation pipes and ditches.
- SIMPLE DESIGN using STANDARD FARM TRACTOR and PARTS provides reduced maintenance costs, down time, obsolescence and depreciation.



YOU OWE IT TO YOURSELF TO INVESTIGATE NOW. CALL OR WRITE TODAY.

# BROUWER

## TURF EQUIPMENT LIMITED

**THE ULTIMATE IN RELIABILITY, VERSATILITY & ECONOMY**

Manufacturer: Woodbine Avenue, Keswick, Ontario, Canada L4P 3E9 Telephone (416) 476-4311



# GOVERNMENT

## UPDATE

### Pronamide benefits exceed risks

The Environmental Protection Agency (EPA) has proposed that uses of the pesticide pronamide be allowed to continue as currently used on turf, commercial nursery plantings, and a number of agricultural products, but with additional precautions to reduce potential risks to human health.

Pronamide has been used in the United States since 1969 under the trade name KERB, primarily manufactured by Rohm & Haas, Philadelphia, Pa. The EPA decided to review the safety of the pesticide after research indicated pronamide caused cancer in mice.

"In general, EPA has concluded that for all uses the economic benefits of pronamide outweigh its risks," Steven D. Jellinek, EPA assistant administrator, said.

Pronamide is used primarily to control weeds which compete with lettuce and alfalfa. It is also used to a lesser extent for weed control in turf and commercial nursery plantings.

EPA's proposal is not a final action. The proposal will be reviewed by EPA's Scientific Advisory Panel, the Department of Agriculture, pronamide registrants, environmental groups, and other interested parties. EPA will consider their comments in making a final decision.

### Integrated pest management ten years away

A committee formed to evaluate steps toward integrated pest management will report to Congress that such measures will require considerable research, millions of dollars, and at least ten years.

The chairman of the committee, Auburn University's Dennis Rouse, said an inadequate base of information on pests and agricultural products, no way to deliver such information, and a lack of participation by manufacturers in integrated pest management research, have contributed to the committee's findings.

Rouse and his group recommended doubling the current support for research on IPM at land-grant colleges and encouragement of further research by the extension service and other organizations. The cost of such a plan was estimated at \$150 million.

### NURSERY

#### Disease of carnations causes emergency ban

A virus disease which attacks carnations has been discovered for the first time in the United States in Colorado and California and may spread further, according to a United States Department of Agriculture spokesman.

The virus, carnation necrotic fleck, was previously known to exist in Japan, Israel, and Italy. An emergency ban on carnation shipments has been placed on two known infected commercial greenhouses near Denver, Colo. and near Salinas, Calif., according to James O. Lee, deputy administrator of USDA's Animal and Plant Health Inspection Service. The ban covers only infected carnations used for propagation and not cut flowers.

Officials in major carnation-growing states are surveying how ex-

tensively the disease has spread, but it will take considerable time to determine the extent of the outbreak because each sample must be identified individually with an electron microscope.

Disease symptoms include grayish white spots on leaves during the initial stages of infection and a reddish/purple discoloration of the leaves as the disease worsens. Some infected plants may show no visible symptoms, but act as carriers that help spread the disease.

The infection can be spread by cuttings made for propagation and by the green peach aphid, a common greenhouse pest.

### FERTILIZER

#### Grace buys Peters, expands nutrient line

W. R. Grace & Co. has purchased, for an undisclosed price, the Robert

B. Peters Co., of Allentown, Pa., manufacturers of pre-mixed, water-soluble nutrients for professional growers.

Operations will continue under the supervision of Robert B. Peters, founder of the company in 1952.

The company also announced that specialty nutrients will be marketed as part of the established Grace horticultural product line and will retain the Peters brand identity.

### TREES

#### New York arborists honor Clarence Lewis

The New York State Arborists Association recently elected a number of new officials and presented several awards at their annual convention in Ellenville, NY.

Leo G. Cook, of Goodell Tree Service, Vestal, NY, was reelected president, Raymond M. Smith, of Davey Tree Expert Co., Tonawanda, NY, was selected first vice-president, and Jon Hickey, of Parr & Hanson, Hicksville, NY, was elected second vice-president. Edgar A. Dahlgren, of Davey Tree Expert Co., Latham, NY, was selected third vice-president at the proceedings.

Also at the convention, Clarence Lewis, a longtime educator in New York, was presented the NYSAA Achievement Award for his work in education and training in the horticultural profession.

Palmer Starner, past president of the NYSAA and charter member of the organization, was presented the Award of Merit for his outstanding service to the association.

### NURSERY

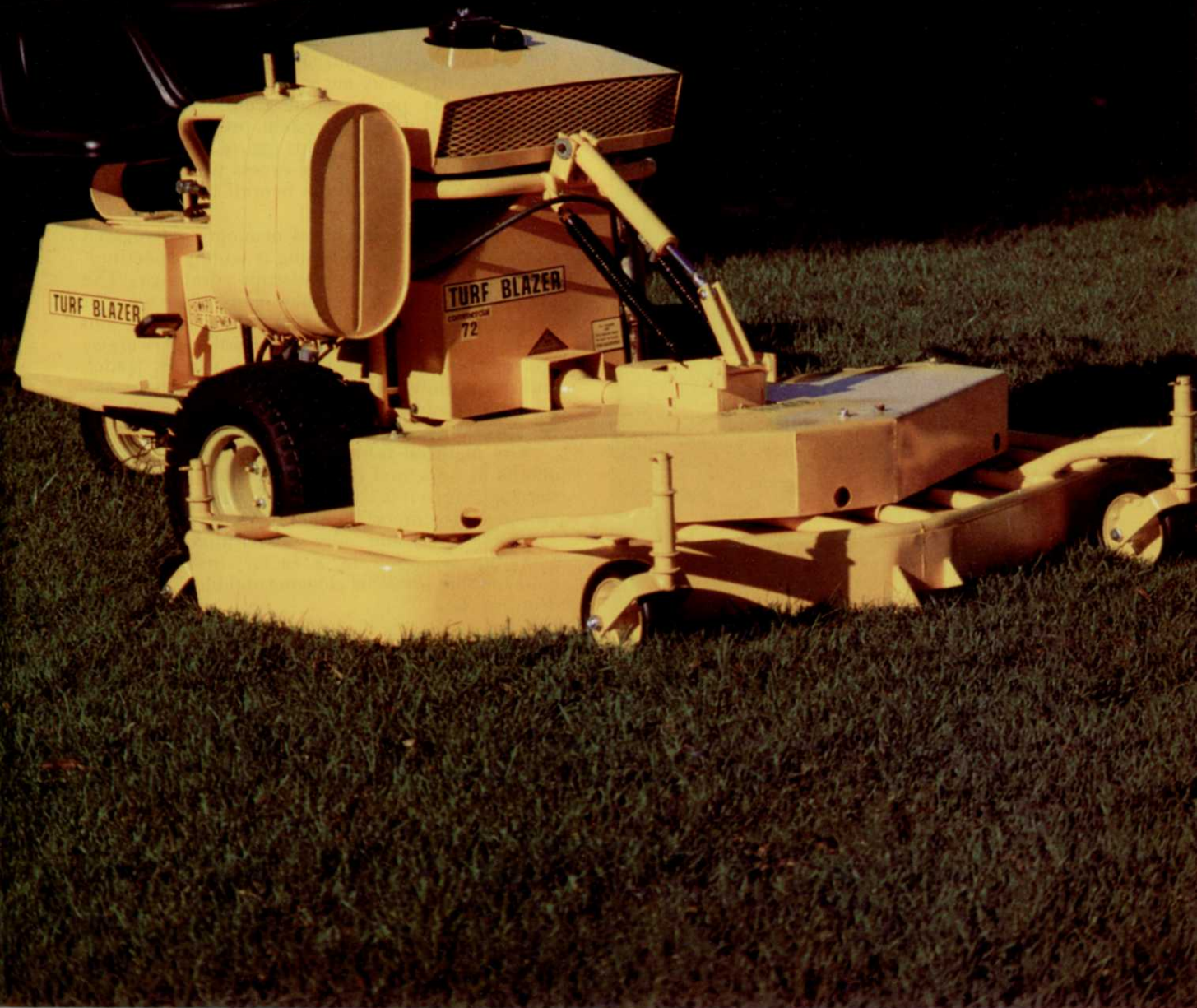
#### Ohio arboretum plans unveiled by nurserymen

Plans were unveiled for the Chadwick Arboretum during the 1979 Ohio Nurserymen's Association annual January convention. The arboretum will be located in Inniswood Gardens in a very picturesque setting consisting of 97 acres in the north-east section of Columbus, Ohio.

The Chadwick Arboretum began as a tribute to "Chad" by the Kiwanis Club of Northern Columbus. The arboretum concept has been warmly received by the American Nurserymen's Association, the International Society of Arboriculture, the Ohio

*Continues on page 86*

# THE PROVEN PERFORMER



## TURF BLAZER 72"

Time tested, field tested, this rugged front mounted 72" mower is built for high capacity mowing, day in and day out, and with our "O" turning radius, you have the trimming capabilities of a small push-mower in congested or confined areas. A commercially constructed hydrostatic transmission enables the operator to establish a

ground speed conducive to his varied mowing conditions.

Other sizes manufactured are 48", 60", 82" and 180" plus a full line of attachments. Are you looking to get the most for your mowing dollar? Call your local Turf Blazer distributor and ask for a demonstration.

Circle 181 on free information card

Manufactured by



18155 Edison Avenue  
Chesterfield, Mo. 63017

# CONSIDERATIONS FOR USE OF CORRUGATED DRAINAGE TUBING



Proper drainage is one of the most important factors in successful landscaping; particularly with high-use turf areas, such as golf course greens, athletic fields, parks, picnic grounds, camp sites and the like. A drainage system, properly designed and installed, not only helps insure maximum use of such areas by removing excess water, but also does much to promote the overall health of turf, trees and plants in general.

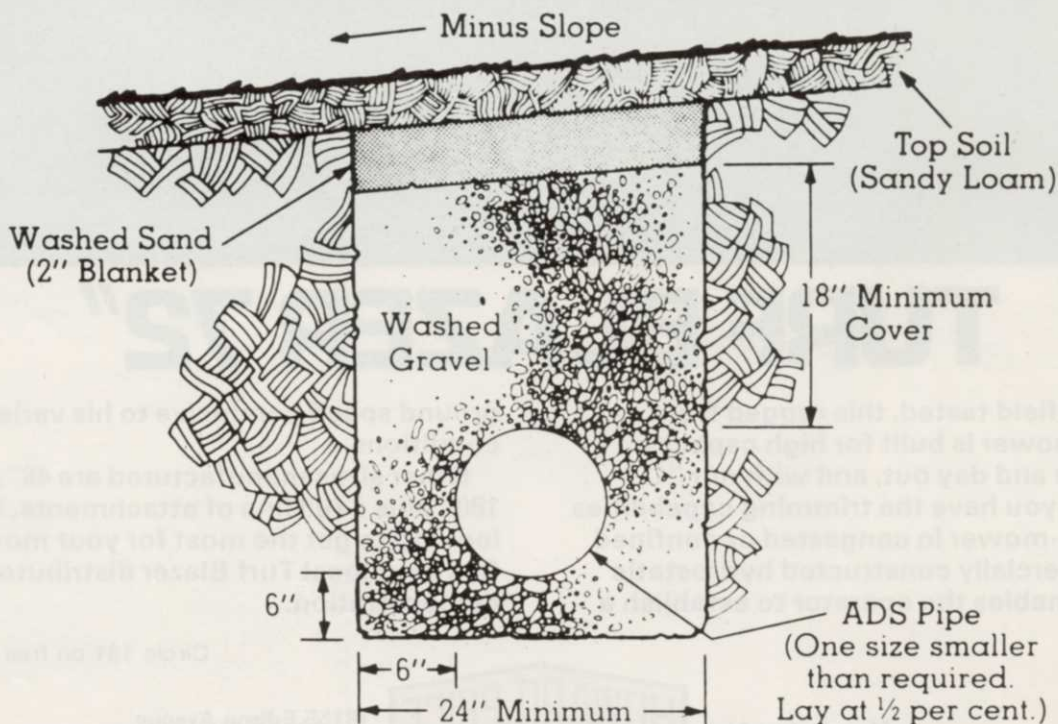
Primarily because of its economy, corrugated polyethylene drainage tubing is widely specified for golf course and landscape drainage. The material is lower in cost than many other types of drainage materials. It is also lighter weight, and easier and faster to install with smaller work crews and machinery. It can be used in narrow trench and drain plow installations, and connections can be made outside the trench, using snap-on fittings. No special tools or fittings are needed.

The material is durable, resists rot, acid and alkalis in soils, and is unaffected by freezing and thawing. Since it is continuous, it will not misalign; an especially important characteristic for unstable soils. For sandy and silty soils, drainage tubing is available wrapped in a factory-installed filter material that prevents clogging and blockage of the drainage line.

## Benefits of drainage

The most obvious benefit is the rapid runoff of rainwater, to help provide maximum playability

## Typical Slope Drainage Collection System





and use of greens, fairways, athletic fields and other high-use areas. Ron Reeve, Technical Director of Advanced Drainage Systems, Inc., a leading manufacturer of corrugated plastic drainage tubing, points out these additional benefits of landscape drainage:

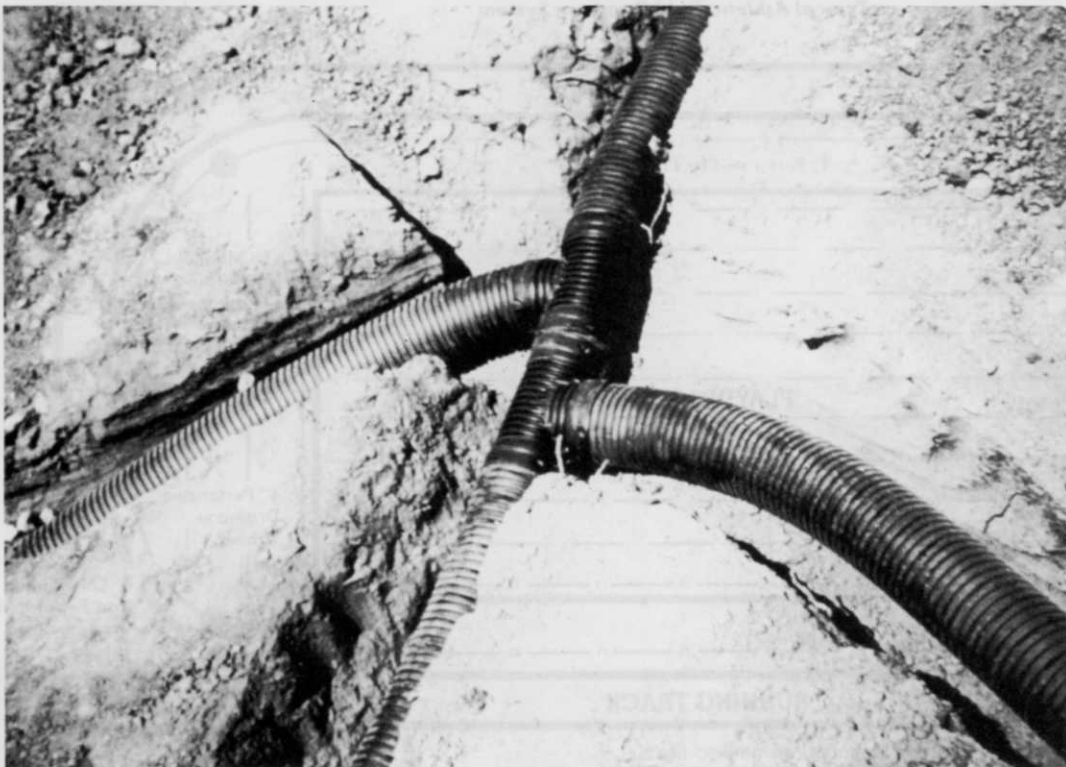
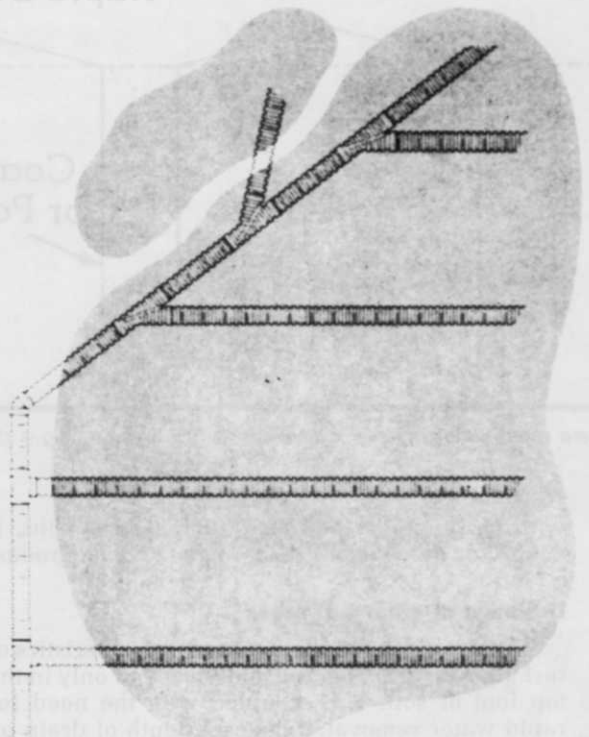
- Improves aeration, for growing healthy trees, shrubs, plants and the hardy turf required in high-traffic areas.
- Removes excess groundwater, thus increasing root zone depth.
- Favors nitrification and bacterial action: plants also have greater resistance to fungi and insects.

**Golf course drainage**

The soil stabilizing action that promotes healthy landscapes and turf, as well as the rapid runoff of surface water, is a vital concern of golf course architects and golf course superintendents, whose primary responsibility is to maintain playability of the course. When the course is frequently too wet, maintenance and repair costs increase while revenues decline.

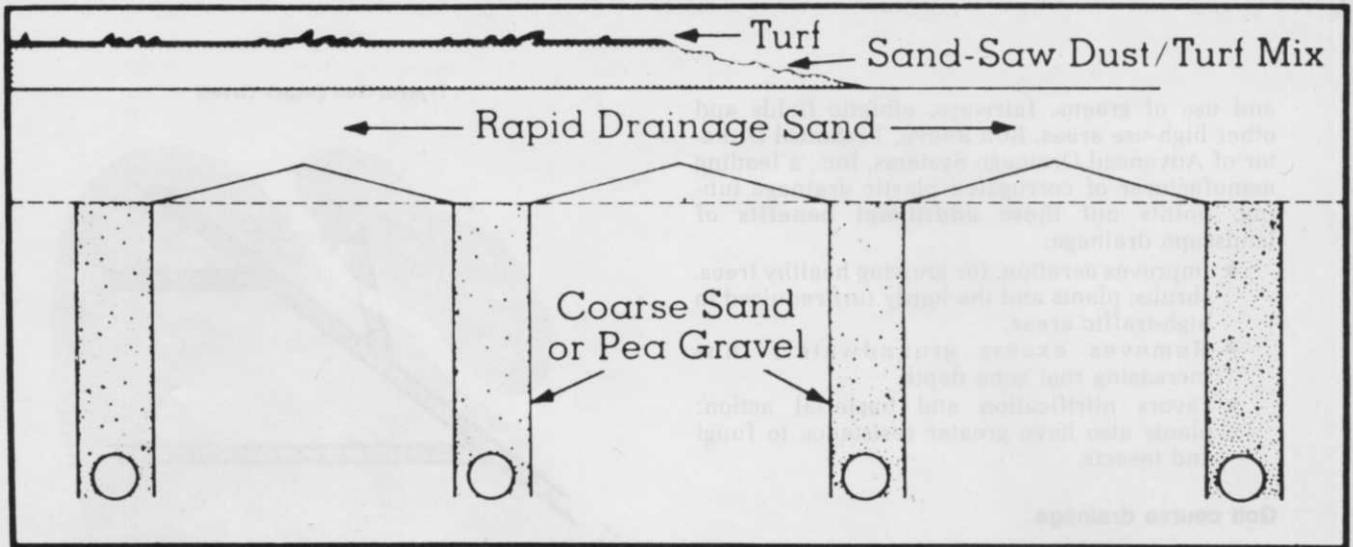
Total course drainage is needed in many areas, but in some cases drainage of greens, traps and local wet spots will suffice. In designing golf course greens, 3-inch and 4-in. diameter tubing is commonly specified. The tubing is placed approximately 18 in. deep and spaced from 4 to 10 ft. apart for rapid drainage. Corrugated drainage tubing,

Typical Golf Course Green



**Joints** present fewer problems with plastic tubing.

## Drainage



Where rapid water removal is needed, narrow strip grading is preferable.

with its flexibility and continuous roll lengths, is suited for quick installation in odd-shaped greens.

### Drainage of other turf areas

Because of the shallow-rooted characteristics of turf grasses, drainage is usually needed only in the top foot of soil. This, coupled with the need for rapid water removal, dictates a depth of drain on such close spacing as from one to three feet. As the illustration shows, the surface can be graded in

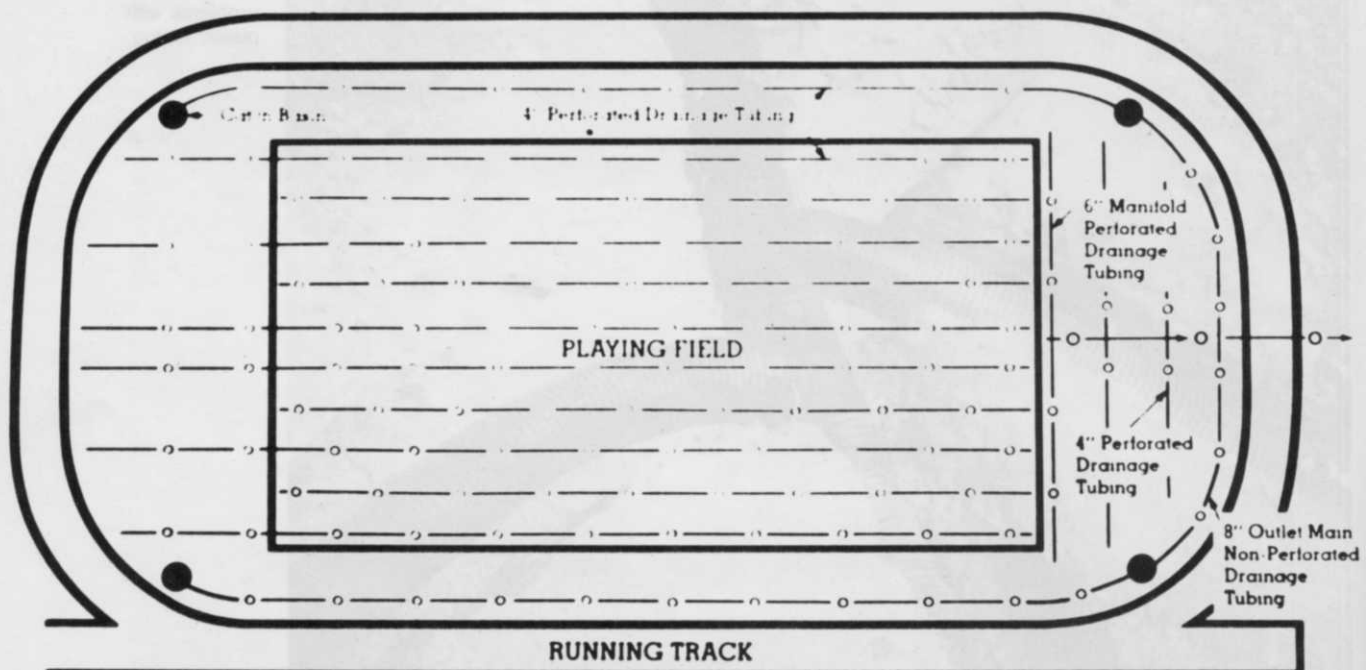
narrow strips, with peaks and valleys like a roof, to facilitate rapid runoff control.

In well-trafficked areas where soil compaction and lack of slope cause surface water to pond, a shallow subsurface drain with surface water inlets may be the answer.

In the case of athletic fields and other places where it is desirable to use the area as soon as

*Continues on page 23*

### Typical Athletic Field Drainage System



To handle play without damage requires good drainage on athletic fields.

# Now, a revolutionary irrigation controller that gives you unmatched flexibility and accuracy.

Another way J-M Buckner® Waterscaping helps you keep things green.

J-M Buckner is first to offer you dependable, solid-state microelectronics in an irrigation controller.

It's our KCS line for golf course, commercial, agricultural and residential applications. They're as easy to operate as a pocket calculator. Twelve or twenty-four individual circuits and four 14-day schedules are accurate to a fraction of a second. KCS totals daily watering time, allows skipping up to nine days, has both automatic and manual syringe cycles and many more unique features. It's designed for accurate, reliable performance to save you time and money.



## Waterscaping: Total Irrigation Capability

With increasingly elaborate landscape designs and constant changes in the weather, irrigation is no longer a mechanical function. Johns-Manville takes the next step... Waterscaping. It's more than controllers, valves and sprinklers that simply move water. It's the total scope of uniform irrigation as it's needed... from research to product design to field performance. Waterscaping is everything you need.

## Behind It All: Experience, Research and Testing.

At our computerized testing facility in Fresno, we research, test and refine all the parts of Buckner systems to develop components that will provide uniform water application and perform according to our published performance data. The components we test come directly off the assembly line.



## One Company That Has It All.

Working with our nationwide network of trained distributors, J-M Buckner has a broad range of products and services to meet virtually any irrigation need. To learn more about Waterscaping (technical information, planning assistance or quality irrigation system components), contact your J-M Buckner Distributor or Vince Nolletti, P.O. Box 232, Fresno, CA 93708, (209) 442-8511.



Circle 144 on free information card

# Johns-Manville



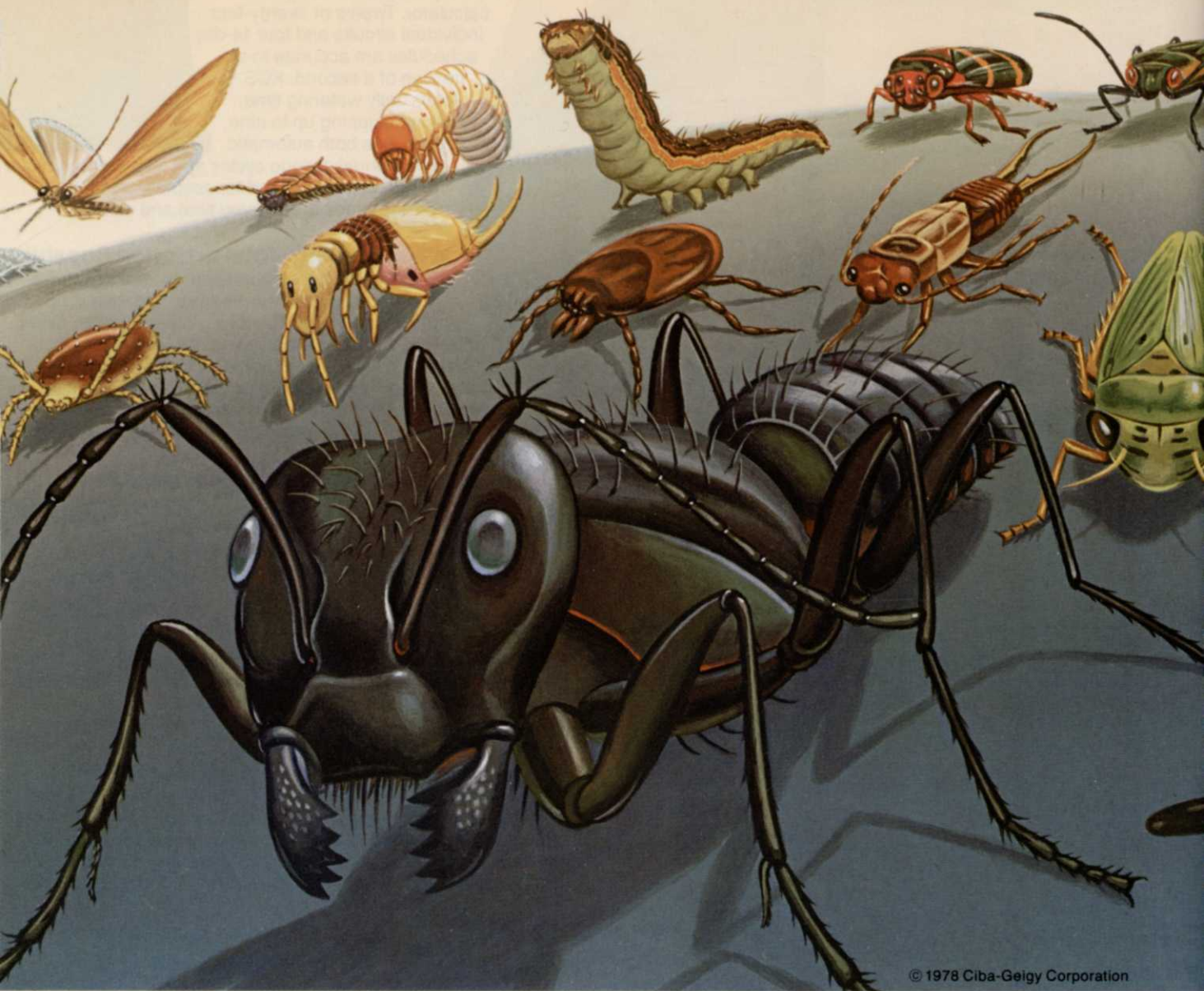
# Diazinon is labeled for How many will you

Diazinon<sup>®</sup> not only controls,  
but is labeled for more turf insects  
than any other turf insecticide.

Just take a look, it's the biggest

label in the business.

You'll count 24 turf insects in  
all. Including white grubs, sod  
webworms, cutworms, chinch bugs,



# every insect on this page. face this season?

armyworms and ants.

This season, be sure to ask your  
local supplier for Diazinon.

And put the biggest label in the

business to work for you.

Ciba-Geigy, Ag. Div., Box  
11422, Greensboro, NC 27409

**Diazinon by CIBA-GEIGY**  
**The biggest label in the business.**

Circle 150 on free information card



**CIBA-GEIGY**



# DERBY

Turf-Type Perennial Ryegrass

## Setting a New Standard of Excellence

Derby is the dark green beauty which joined Manhattan and Pennfine on the "highly preferred list of ryegrasses." That was last year. Now Derby is setting a new standard of excellence.

In the eyes of many Golf Superintendents it reigns supreme among the turf-type ryegrasses today. Why? Because it performs! And a Superintendent knows that claims are great, but performance counts.

- Consistently performs better than other leading varieties from California to Florida
- Durable, dark green and has excellent mowing qualities
- Tolerates a variety of soils & responds rapidly to fertilization
- Germinates in a week (or even less) under ideal conditions
- Better-than-average heat and drought tolerance
- An adaptable and disease resistant cool-season turf grass
- An excellent record as a Southern winter grass
- Thrives when close-cut



**INTERNATIONAL SEEDS, INC.**

Dept. D • P.O. Box 168 • Halsey, Oregon 97348

(503) 369-2251 • TWX 510/590-0765

possible after a downpour, a drainage system providing runoff that keeps up with rainfall may be justified. In areas of high intensity rainfall, design drainage rates as high as 1/3-in. per hour or 8 in. in 24 hours (160 gpm per acre) are used.

In the example shown, a football field 160 by 360 ft., 10 lines 300 ft. long, spaced 16 feet apart are used. Each line would handle the flow from 16 by 360 ft., or 5,760 sq. ft. (or 0.13 acres). Water flow requirement is 21 gpm per line. For a slope of 0.04, 3-in. tubing is adequate. For a slope of 0.100 4-in. tubing is required.

While drainage is certainly a major factor in successful landscaping, its cost, in proportion to the overall construction budget, is small. Depending upon locality and conditions encountered, drainage cost represents only about 8% to 10% of a total golf course construction budget and only about 5% of a landscaping budget. **WTT**

**Four-inch** golf course drain in shallow trench and covered with gravel for rapid intake.



## We're putting our brains together to save you money.

Take the dependable, reliable Rain Bird® RC-7A, RC-1230 and RC-1260 — mix them up in any double combination — and what have you got?

Our brand new line of super economy controllers.

Here's how it works. Say you've got a light commercial or industrial (maybe even a large residential) job with 17 stations.

We'll give you a custom package complete with Heavy Duty Metal turf cabinet, one RC-7A and one RC-1230, for 18 total stations hooked in series (a little growing room never hurts).

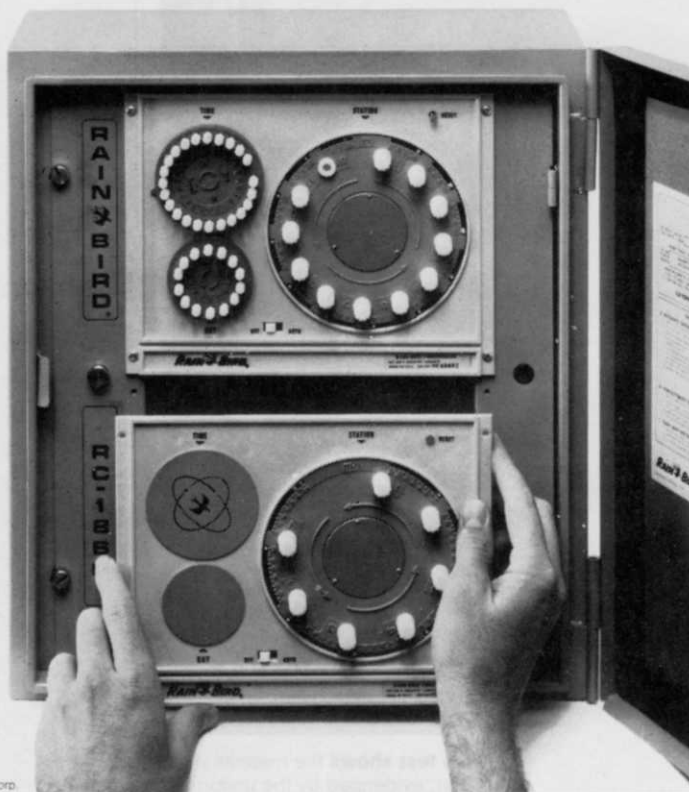
The savings per station for both you and your customer can be substantial. Nearly half the cost of one big 18-station controller.

So think about Rain Bird next time you need a custom controller package.

No sense paying more for rain than you really need to.

**RAIN BIRD®**  
Bringing new ideas to life.

7045 N. Grand Avenue, Glendora, CA 91740



# PROFESSIONAL APPLICATOR MUST KNOW MIXING BASICS

by Paul A. Sartoretto, Ph.D.

Can a pesticide applicator get by without a knowledge of chemistry and still determine what pesticides are compatible in the spray tank? A knowledge of chemistry is helpful, but not essential if one masters a few basic rules.

A professional must know that the pesticides he mixes in water will retain their own identity and not react with each other. The following four rules and exceptions are helpful in determining tank mixes. However, if there is any doubt, simple tests using a glass jar can be used to check compatibility.

Green Industry applicators are concerned primarily with water mixes. Therefore, the need is to determine how each chemical reacts with water and how each chemical reacts with other chemicals in a water system.

---

**Dr. Sartoretto** is a member of the board of W. A. Cleary Corp., Somerset, NJ. He is also director of research and development for the company. Sartoretto has a Ph.D. in chemistry from Notre Dame.

---

All chemicals can be classed into three groups; cationic (positively charged), anionic (negatively charged), and nonionic (no charge). Positively charged chemicals (cations) attract negatively charged chemicals (anions). Nonions have no attraction to other chemicals, but their ability to mingle (solubility) with other nonions of similar structure must be recognized. In a water system, nonions that are soluble are termed hydrophylic, and nonions that are insoluble are termed hydrophobic.

When cations and anions are mixed together they form salts. When large heavy cations and heavy anions come in contact, they form heavy salts which are insoluble and precipitate out of the mix. (Precipitate means to separate out of the solution or suspension, usually a visible solid dropping to the bottom of the container). Smaller cations and anions form smaller salts which can co-exist in solution without precipitating. The specific cations and anions that might cause problems are listed in the "Exception to the Rules" section of this article.

The basic principle of chemical compatibility is the classification of all chemicals, whether they be herbicides, fungicides, insecticides or fertilizers, into two groups: **solubles** and **insolubles**, because it's the physical properties not the chemical properties that determine compatibility 99% of the time.

Having then classified all chemicals into solubles and insolubles, I have devised a set of rules which when followed carefully permits the applicator to tank mix at will without incurring phytotoxicity. E.P.A. has devised key signal letters which alert applicators and inform them whether or not the product they are using is soluble or insoluble.

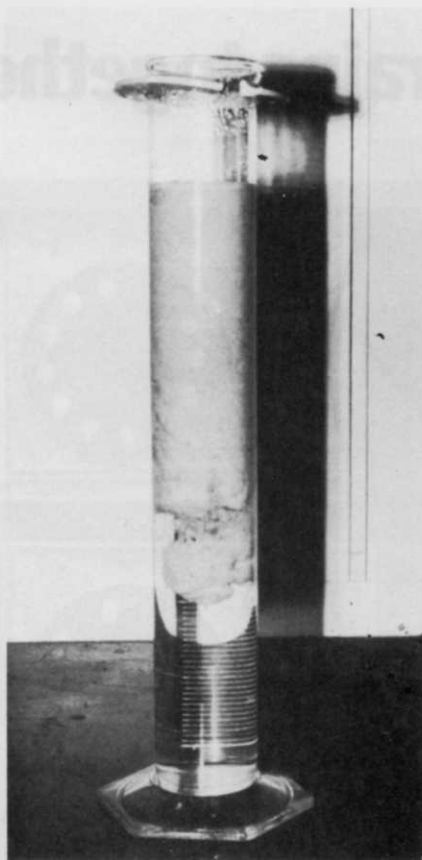
These signal letters are as follows:

S	indicates solution
SP	" soluble powder
EC	" emulsifiable concentrate
WP	" wettable powder
F	" flowable

The S, SP, and EC are classified as solubles; whereas, the WP and F are insolubles.

The amount of water sprayed per 1000 sq. ft. is another variable that requires some explanation that will affect the pesticides that should or should not be mixed in the spray tank. For example, an applicator will use 3 to 5 gallons per 1000 sq. ft. on greens and tees, and only 1/2 to 1 gallon per 1000 sq. ft. on fairways, depending upon whether he is using a mist blower or a spray boom.

By far, the largest group of chemicals are the insolubles. Most technical chemicals are, for all practical purposes, insoluble in water. The



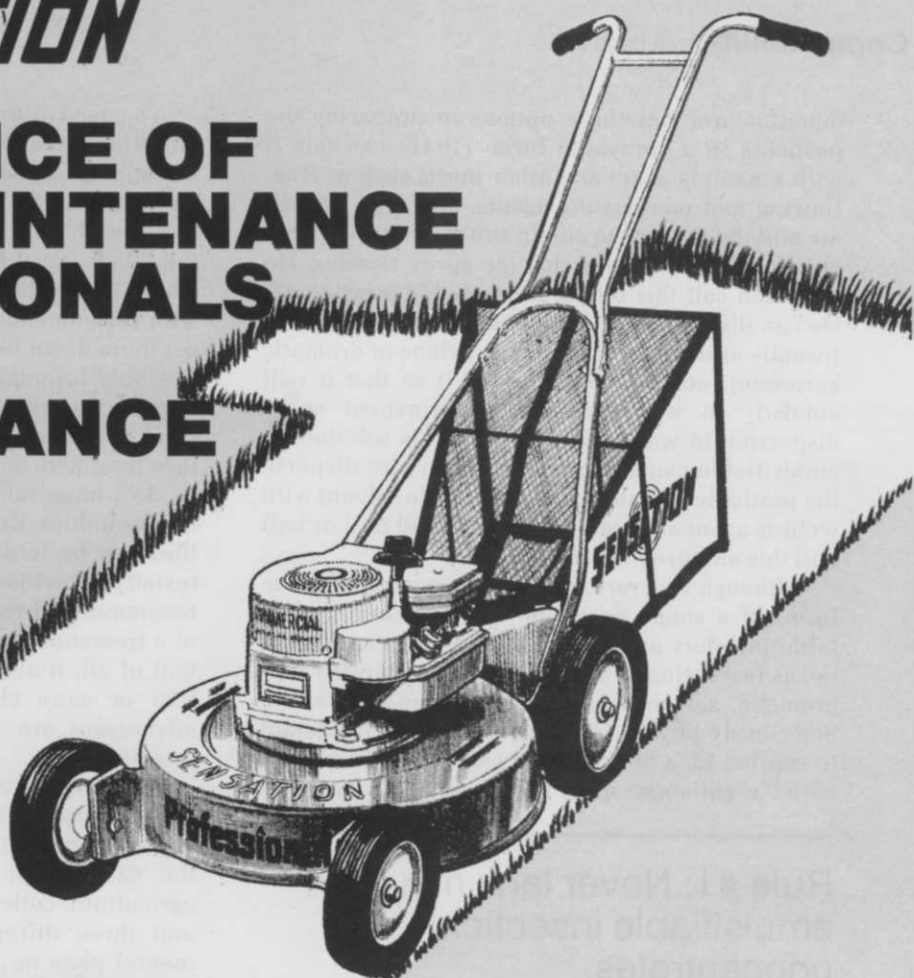
**This test shows** the material mixes well with water, evidenced by the uniform dispersal as the material falls with gravity.

*Continues on page 26*



# **SENSATION**

## **No. 1 CHOICE OF LAWN MAINTENANCE PROFESSIONALS AND PERFORMANCE SEEKING HOME- OWNERS**



### **MOWS AND BAGS WET OR DRY GRASS WITHOUT CLOGGING!**

### **Seeking Performance...Power... Durability? GET A SENSATION!**

With exclusive valve rotator, replaceable wheel bearings, mag-aluminum cast deck, patented air lift blade with balanced fly wheel for bagging wet grass without clogging...SENSATION more than ever the No. 1 Choice.

### **No. 1 features that make the No. 1 difference for you!**

**WRITE TODAY FOR MORE INFORMATION ON SENSATION MOWERS...  
THE SENSATION CORPORATION 3601 North 16th Street • Omaha, Nebraska 68110**

### **THE HIGH-WHEELER MAKES SHORT WORK OF TALL GRASSES AND WEEDS...**

Put power into your big jobs with the 24" self-propelled High-Wheeler. 5 HP Briggs & Stratton engine and geared transmission with 3-speed forward and reverse makes it ideal for toughest weeds & grasses.



manufacturer has three options in preparing the pesticide in a sprayable form. (1) He can mix it with a wetting agent and other inerts such as free-flowing and non-dusting agents, and then he will air-mill the mixture to obtain sub-micron size particles so that it will not clog the spray nozzles. He will then call this mixture a wettable powder. (2) He can dissolve the pesticide in an organic solvent (usually aromatic spirits such as xylene or aromatic kerosene), add an emulsifier to it so that it will emulsify in water to give a permanent milky dispersion in water, and will call this solution an emulsifiable concentrate. (3) He can also disperse the pesticide in water or water soluble solvent with wetting agent and stabilizers then sand mill or ball mill this mixture into a flowable.

Although it is rare, one can encounter all three forms of a single pesticide: EC, WP, and F. Wettable powders and flowables are safer to use but not as fast acting as emulsifiable concentrates. The aromatic solvents used in preparing EC's are notoriously phytotoxic. This is why it is important to confine EC's but are rarely used. The EC's used with low gallonage spray invite phytotoxicity.

---

**Rule #1: Never tank mix emulsifiable insecticide concentrates.**

**Rule #2: All insolubles can be tank mixed without incurring phytotoxicity provided the products are sprayed at recommended rates.**

**Rule #3: Only one soluble chemical can be tank mixed with any number of insolubles. If two soluble chemicals are tank mixed with or without insolubles, the rate of each soluble should be cut in half to avoid phytotoxicity.**

**Rule #4: Soluble fertilizers and trace elements can be added individually or mixed, provided the amount will not exceed one ounce solid per gallon tank spray mix.**

To guard against such an occurrence we formulate **Rule Number 1. Never tank mix emulsifiable insecticide concentrates.** Not only will you incur phytotoxicity from the aromatic solvent sitting on the grass blade, but the insecticides, according to the labels, must be sprayed with large volumes of water (10 to 30 gallons), sometimes followed up with recommendations to water them in heavily to get them down to grubs. The wettable powder and flowable formulations will not burn but must still require watering for grub proofing. However, they can be used with a limited amount of water for surface treatment and can be treated as insolubles.

As I have said before, the largest category are the insolubles. **Rule Number 2 states that all insolubles can be tank mixed without incurring phytotoxicity provided the products are sprayed at recommended rates.** This permits the tank mixing of a tremendous variety of chemicals. Most important of all, it allows the applicator to spray three, four or more chemicals at the same time. The advantages are unbelievable if he explores the possibilities.

Broad spectrum control, where money is no object, is a must. The applicator should not rely on a single chemical to control a target disease. Follow the example of the pathologists at the various agricultural colleges. Note how they are mixing two and three different fungicides in their experimental plots in an attempt to achieve better control.

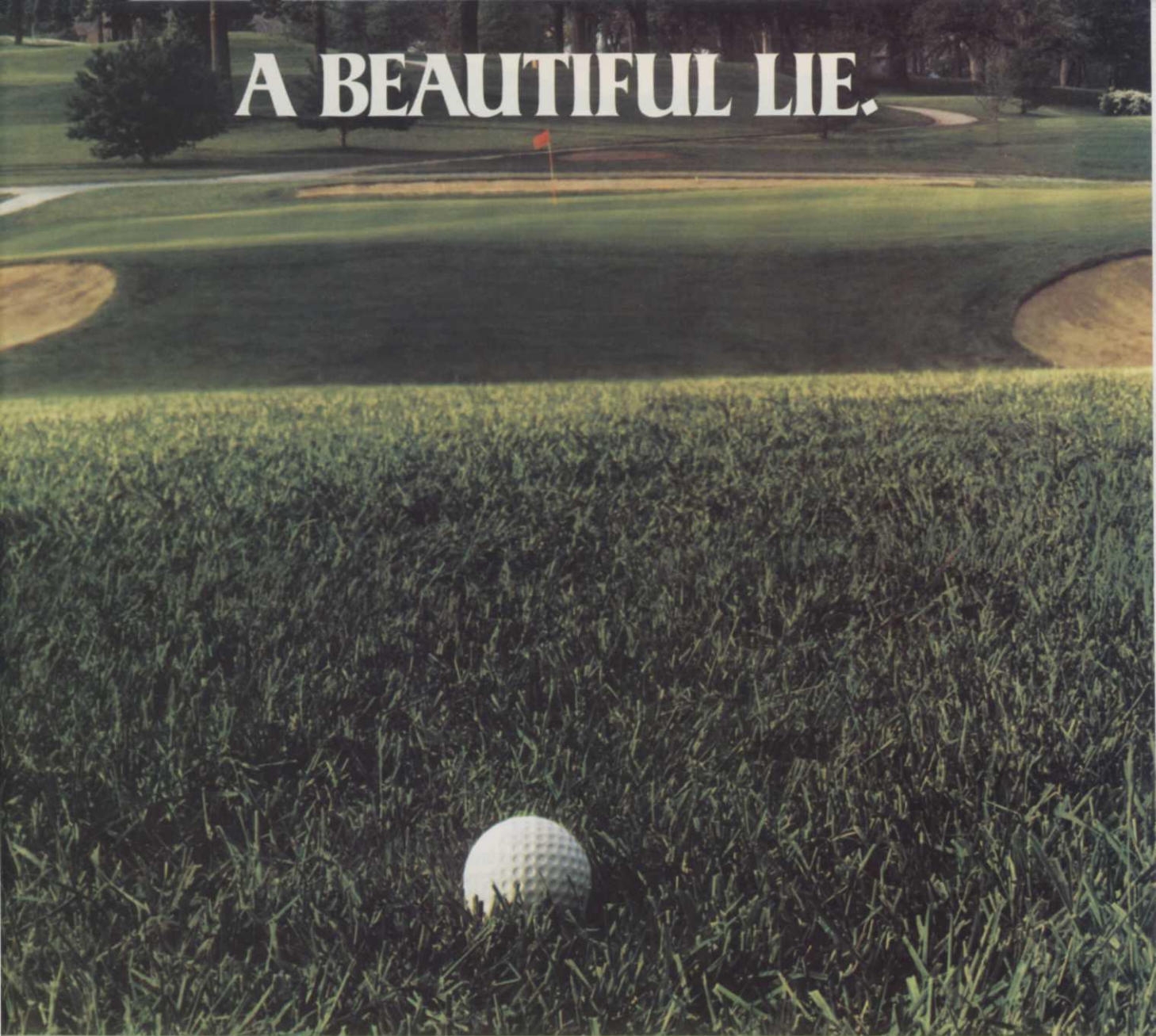
The trend that I have tried to pioneer over the last 20 years is precisely in this direction and many competitive manufacturers have joined in. More recently, with the advent of systemic fungicides the broad spectrum mixture has assumed brighter and newer horizons because of the longer residual control attainable with the addition of a systemic along with one or two contact fungicides in the spray tank.

Prior to the systemics, it was an accepted fact that contact fungicides did their job on the grass blade and in the thatch and were dissipated within two to three days. A good contact fungicide will kill germinating spores at a few parts per million. It is usually sprayed on the grass blade at about 5,000 parts per million. With the present-day irrigation and mowing practices, it doesn't take more than two to three days to get down to a dilution below the effective five parts per million.

In hot, humid weather accompanied by sporadic showers, an applicator had to spray twice a week, otherwise his grass would go unprotected the latter part of the week. This is not the case since the advent of systemics. They hydrolyze in the soil to knock down the fungus population, not only in the soil but also within the grass blade by diffusion through the root system, thereby giving extended protection.

*Continues on page 31*

# A BEAUTIFUL LIE.



## A BEAUTIFUL RYE.

There's no doubt about it. REGAL is the new turf-type perennial ryegrass that combines color, vigor and density for an elegant turf.

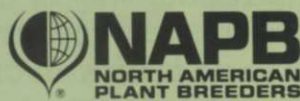
REGAL's dark green, fine-textured leaves look beautiful alone, or blend well with other turf-type ryegrasses. It has excellent tillering characteristics, and during periods of transition with bermudagrass, helps to maintain a lush, green, uniform turf.

And REGAL cuts clean, for a beautiful lie on tees, greens, fairways and roughs. Without ragged edges, or grainy areas.



Try REGAL—bred for rapid germination, exceptional vigor, density and persistence. Good disease resistance, too.

If you'd like more information on REGAL, contact North American Plant Breeders. P.O. Box 2955. Mission, Kansas. 66205 8-5256



**First in the science of seeds.™**

Circle 137 on free information card

# REGAL

the ryegrass that gives your course a beautiful edge.

# How to pick



## **B5100**

2- or 4-wheel drive.  
12 hp. 2 cyl.

Designed for grass cutting, vegetable gardens, and general estate maintenance. For home owners, this tractor is a step up from riding mowers. Can use mid-mount or rear-mount mower, rotary tiller, plow, disc harrow, rear blade.

## **B6100**

2- or 4-wheel drive.  
14 hp. 3 cyl.

Similar to B5100, but bigger engine offers more pulling power. Can handle all the same implements as the B7100DT. Good tractor for landscapers, nurserymen, and other commercial users requiring a tractor to handle variety of materials.

## **B7100DT**

4-wheel drive.  
16 hp. 3 cyl.

Our biggest selling tractor. Small enough for grass cutting and general work around private homes. Strong enough for a wide variety of commercial applications, especially park maintenance, nurseries, landscape contractors. Implements include post hole digger, front blade, trencher, front-end loader, backhoe, snow-blower, as well as all those listed under B5100.

## **L185**

2- or 4-wheel drive.  
17 hp. 2 cyl.

Works as mowing tractor with turf tires. With 2-wheel drive it is versatile chore tractor on large farms. For farm or industrial use where ground is soggy, we recommend 4-wheel drive for maximum traction. Category 1 3-point hitch can handle plow, cultivator, disc harrow, rotary tiller. Also a wide range of earth moving and excavating implements. Rental operators will find this model in great demand.

## **L245**

2- or 4-wheel drive.  
25 hp. 3 cyl.

This model has many crop applications, especially vegetable growing and orchard work. A range of implements available, including hoe, front-end loader, post hole digger, front blade, box scraper.

## **L245HC**

(not shown)  
2-wheel drive.  
25 hp. 3 cyl.

New high-clearance tractor, ideal for special crops such as vegetables and tobacco. Provides ample 22" ground clearance plus an uncluttered off-set operator's platform for excellent visibility.

Have you noticed the color of our Kubota tractors? Orange. Every one of them. It's our way of making it easy for you to choose a good tractor. Now all you have to do is pick an orange. That way you won't get a lemon.

In the 12 to 55.5 hp range, no one offers as many models as Kubota. And all our mid-size Kubotas give you the qualities that separate real tractors from the lightweight garden variety.

All Kubotas have water-cooled diesel engines, which are designed with more cylinders than many competitive models. Standard equipment on all models includes rear PTO and a 3-point hydraulic hitch that accommodates a variety of implements.

For more information, write or call us. Better yet, see your Kubota dealer. He knows more about how

# an orange.



## **L285**

4-wheel drive.  
30 hp. 4 cyl.  
4-cylinder diesel engine provides lots of smooth power. Built to accommodate a long list of implements, including rotary rear-mount mowers, tillers, disc mowers, box scraper, front blade, front loader, backhoe, plow. Good tractor on small farm. Also wide application for institutional or governmental grounds maintenance. With front loader, it is excellent machine for dairy farmer.

## **L295DT**

4-wheel drive.  
30 hp. 3 cyl.  
Will outpull many larger farm tractors that only have 2-wheel drive. Can handle most medium-sized Category 1 farm implements. Also, earth moving capability makes it suitable for general building contractors. Outstanding fuel economy for its size. Draft and position control is standard.

## **L345**

2-wheel drive. 34 hp. 4 cyl.  
Brand-new model designed to fit into popular horsepower range. 4 cylinders let it run more smoothly than many competing models. Fine all-round performer as chore tractor on large farm. Handy for general contractor because it doesn't require a heavy-duty trailer to haul it to construction site. Live rear PTO, draft and position control, power steering are standard on this model and all larger tractors.

## **M4500DT**

4-wheel drive. 55.5 hp. 6 cyl.  
Our big brute. Tremendous pulling power for its size and weight. Works beautifully as primary tractor on smaller farms. Fine for land where traction is critical. Ideal for building contractors who start work in the North as soon as frost is out of the ground.

## **M4000** (not shown)

2-wheel drive. 47.5 hp. 6 cyl.  
Good number one tractor for small farms, especially vegetable crops. Also excellent for many types of small to medium excavating work. 6 cylinders provide smooth torque. Quiet running. Economical to operate. 16 forward gears supply wide range of ground speeds to match many different implement uses.

Pick an orange than anybody.

For specific information about any Kubota tractor, call 1-800-241-8444. (In Georgia 1-800-282-1333.) Ask for Operator 63.

## We're looking for work.



**HELP!** To help me pick an orange, please send free spec sheets on the following Kubota models:

1. (Model No.) \_\_\_\_\_

2. (Model No.) \_\_\_\_\_

3. (Model No.) \_\_\_\_\_

Mail to: Advertising Department  
Kubota Tractor Corporation, 550 W. Artesia Blvd.  
P. O. Box 7020, Compton, CA 90224

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ COUNTY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

AREA CODE \_\_\_\_\_ TELEPHONE NUMBER \_\_\_\_\_

WTT3

# Elanco's new Surflan® gives you months of weed control for only pennies per 1,000 sq. ft.



**Where ornamentals are grown, and annual grasses and broadleaf weeds are a problem Surflan delivers outstanding weed control.**

**Does your herbicide measure up to Surflan?**

	Length of Control	Economical	User Safety Category	Ease of Application
<b>SURFLAN®</b>	6-8 mos.	\$21-\$43 per acre	Category 3 Caution	Surface applied Spray
<b>Other Herbicides</b>	Does yours last as long?	Up to \$90* per acre?	Caution 3 Warning 2 or Danger 1	Does yours need mechanical incorporation, or immediate rainfall or irrigation?

\*Based on manufacturers suggested retail prices.

Maybe you should compare your herbicide with Surflan in some other ways too.

Whenever annual grasses and most broadleaf weeds are a problem in ornamentals depend on Elanco's new Surflan for months of weed control at a reasonable price.

Another of Elanco's dependable weed control crew.



**Elanco Products Company**  
A Division of Eli Lilly and Co.  
Dept. E455  
Indianapolis, Indiana 46206 U.S.A.

There are soluble fungicides as well. When applying soluble chemicals including fungicides, keep in mind **Rule Number 3. Only one soluble chemical can be tank mixed with any number of insolubles. If two soluble chemicals are tank mixed with or without insolubles, the rate of each soluble should be cut in half to avoid phytotoxicity.** Although they are not numerous, the superintendent is familiar with and has had experience in applying the soluble fungicides such as PMAS, Caddy, Cadminate and Actidione. The latter two are soluble in the spray tank. Coincidentally, three large manufacturers have mixtures of solubles with insolubles presently being marketed.

There is no question that the soluble fungicides have the clout necessary to stop an advanced fungus infection. One can only hypothesize why this is so, and the question resolves itself with the explanation of the difference between fungicidal and fungistatic activity. Fungicides kill whereas fungistats inhibit. But this explanation is too simple. When a spore germinates and sends out a tiny, tender shoot, it is easily killed. Since this is only visible microscopically, the net result determined by sight is that the chemical has prevented spore germination-fungistatic effect. If the spore germi-

nates and the shoot gets a foothold within the grass blade, it takes a more powerful chemical to kill it — fungicidal effect. Some insoluble fungicides possess this advanced stage killing ability to varying degrees; but all of the solubles are immediately fungicidal.

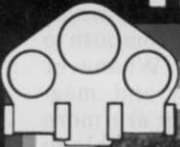
The author has maintained for several years that the ideal tank mix of fungicides is a three-way combination of soluble contact/insoluble contact/insoluble systemic mixture; and, for years has even recommended mixing two soluble contacts, each at half rate to get a broader spectrum than the single soluble at full rate.

Applying rules 2 and 3 in an attempt to get a broader spectrum of control, all of the insolubles can be tank mixed. They can also be tank mixed with one of the solubles or one of the soluble-insoluble combinations. If the solubles and soluble-insoluble combinations are tank mixed, the dosage should be cut in proportion to the number of chemicals added. Because of the soluble portion of the group of soluble-insolubles, they should be treated as if they were solubles. It should be emphasized again that the dosages of two solubles should be cut in half if tank mixed. If three solubles are tank mixed, the dosages should be cut to one-

*Continues on page 32*

# I HECKENDORN CAN CUT IT!

## Complete line of popular size mowers



36"

50"

72"

62"

88"

**When budgets are tight and manpower is scarce, you need a Heckendorn riding mower to get the job done right.**

Heckendorn mowers are durable, simple to operate and easy to keep in repair. Many owners tell us that when they hear the name Heckendorn, they immediately think quality.

Standard features include front wheel steering,

zero turning radius, hinged sidemount units that follow ground contours and allow drive wheels to remain on stable ground while trimming to within one-half inch of most obstacles. Foot operated lift allows instant clearing of obstructions or ground irregularities.

**Heckendorn mowers are**

- Economically priced
- Powered for clean cut
- Easy to maneuver in close areas

For new GSA #, dealer name or product literature, please call or write.

Industrial Grounds Maintenance Equipment

# HECKENDORN

MANUFACTURING CO., INC. / Cedar Point, KS 66843 316 / 274-4201

ks and works and works and works and works and works and works and works and works and works and works and works and works and works and

third of the recommended rate of each soluble component.

A prime example is the successful combination of MCPP, 2,4-D and dicamba. The recommended rate of MCPP is between 1 and 1½ pounds per acre and the rate of 2,4-D is 1 pound per acre and the rate of dicamba is ¼ - ⅓ pound per acre. However, a successful combination of the three is in the neighborhood of ½ pound MCPP, plus ¼ pound 2,4-D, plus ⅓ pound dicamba. These come premixed in approximately that ratio under the trade names of Trimec and Trex-San.

There are some MCPP/2,4-D combinations in which the rate of MCPP is 1 pound and the rate of 2,4-D is ½ pound. Another example of the synergistic effect of two postemergent chemicals is the combination of DSMA and 2,4-D. In Texas, where 2,4-D is not prevalently used because of its injury to cotton, DSMA anhydrous is recommended for the control of dallisgrass at the rate of 7-10 pounds per acre on bermudagrass. In nearby Louisiana, equally good control has been achieved by the use of 4-5 pounds DSMA plus ½ pound of 2,4-D. This practice has been going on for more than 10 years and, coincidentally, it conforms with rule number 2, which dictates that if two solubles are used together it is a wise practice to cut the dosage of each in half.

Every pesticide applicator knows that fertilizers are usually combinations of insoluble components, and because of the soluble fractions the fertilizers must be watered in to prevent burning. It is not an uncommon practice to add soluble fertilizers to the spray tank in small quantities to attain an immediate greening effect on specific occasions. A more common practice is to add chelated iron for the same reason. But there have been instances of burning because an applicator had a heavy hand in applying these products.

The phenomenon known as salt index comes into play in determining how much of the soluble fertilizer components can be added to the spray tank without incurring phytotoxicity.

**Rule Number 4 states that soluble fertilizers and trace elements can be added individually or mixed, provided that the amount will not exceed one ounce solid per gallon tank spray mix.** The author has used two ounces per gallon, and has not experienced any burning at the higher rate, but prefers the lower rate. The components that fall into this category are solubles such as urea, ammonium nitrate, ammonium sulfate, muriate of potash, ammonium phosphate, ferrous sulfate, chelated iron, epsom salts, etc.

**Exceptions to the rule** governing compatibility of solubles is as follows: Heavy cations such as mercury and cadmium fungicides and Paraquat and Diquat are incompatible with heavy anionic herbicides such as DSMA, MSMA, 2,4-D, MCPP, MCPA, and DICAMBA. Precipitation will take place in the spray tank. These combinations are not likely to be used because selective weed control does not involve non-selective weed killers such as Paraquat or Diquat, and the applicator is not likely to use a soluble fungicide such as cadmium or mercury.

There are quick methods to check compatibility. When solubles are mixed with water in the proportion to be used in the spray tank, the solution should remain clear for the number of hours anticipated for spraying.

Emulsifiable concentrates should disperse throughout the water in a stable emulsion without incurring an oily layer separation on standing. The emulsifiable concentrates should be added last, after all solubles and wettables have been added. (However, I strongly urge not to tank mix emulsifiable concentrates).

---

If three solubles are tank mixed, the dosage should be cut to one-third of the recommended rate of each soluble component.

---

Thirdly, when wettable powders are components of a tank mix, after standing awhile, the mixture should be sieved through at least a 100 mesh screen. If residue appears on the screen, agglomeration or precipitation has taken place, signaling incompatibility.

These tests can be run in a convenient quart glass jar. The sieve screen should be wet with water with some surfactant added before sieving.

Soluble iron or magnesium salts might remain clear in the glass jar for about an hour and will then begin to hydrolyze in hard water or in water that has a pH of 7 or above. They will decompose to oxide precipitates that are of no value. Whenever possible, use chelated forms of iron and magnesium which will not hydrolyze. They are more expensive, but one can use far less and be able to count on their effectiveness.

Coincidentally, herbicides also fall into two classes— solubles and insolubles. The soluble herbicides are postemergent in nature whereas the insolubles are preemergent in activity. The insoluble preemergents are safe to apply because by their very nature they slowly release the active toxicant by hydrolysis in the soil (although certain preemergents exhibit some phytotoxicity on certain species and cultivars; however, these cautions are covered on the labels).

The rate of release of active toxicants is sufficient to kill the germinating weed seedling and, strangely enough, insufficient as a rule to kill the mature weed plant. The rate of release will determine the length of residual activity of the product. Each individual preemergent has its own time release schedule. The residuals range anywhere from 45 to 90 days, with an average of about 60 days.

It should be noted that one important factor which will materially alter the residual is oil structure. Adsorption of the hydrolytic toxicant by soil particles dictates different rates for different soils. Label directions must be carefully followed. But

Continues on page 34



# Which aeration hole is better for your greens?

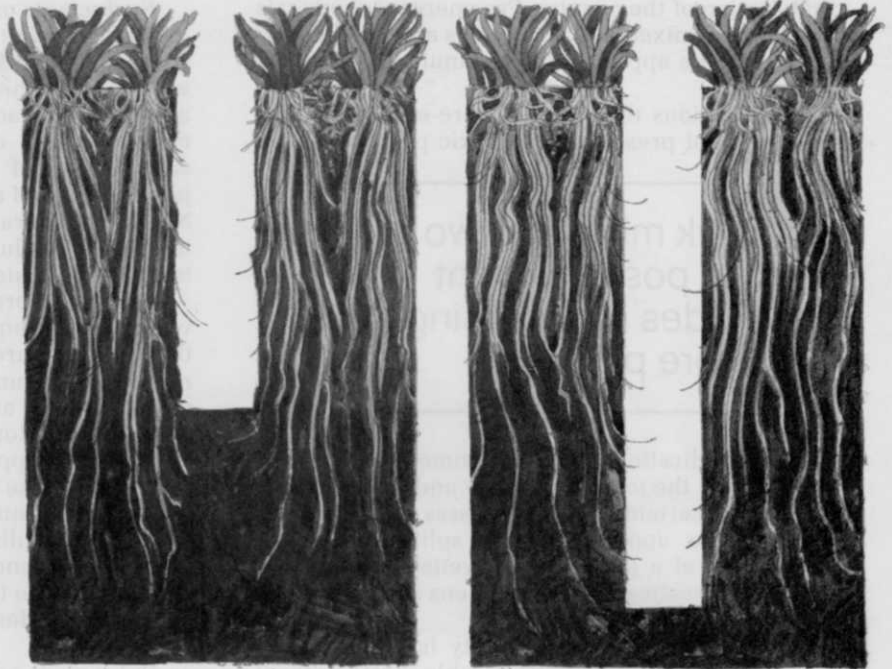
The answer, if you haven't already guessed, is the Greensaire II hole. And for good reasons.

One, it's deeper. The primary objective of aeration is to help air, water and fertilizer penetrate the soil. The Greensaire II removes cores up to 3" deep, allowing these vital nutrients to reach the root zone where they're needed.

The fact that there are 36 of these deep holes per square foot means that you also remove more soil. This not only relieves the toughest compaction problems, but it also allows you to replace more of the old, depleted soil.

The Greensaire II hole is precise. It won't affect the roll of a golf ball, so your green is back in play sooner. You can aerate most greens in 45 minutes or less.

And when you use the Greensaire II, you can also use the unique Ryan Core Processor attachment. It catches the



cores, separates good soil from debris, puts the good soil back on top, and bags the debris. You aerate, top dress and collect thatch in one operation.

If you want these same fine aerating qualities, but on a smaller scale, choose the Greensaire 16. It aerates a 16" swath instead of a 24", uses the same selection of tines

and has a convenient windrow attachment that makes core removal easy.

Of course, like all Ryan equipment, these machines are built to last. So when you aerate, don't just scratch the surface. Get the deep penetration you need with the Greensaire II, Greensaire 16 and Core Processor.

Write for your free Ryan catalog today.



## Ryan Greensaire II. The turfman's timesaver.

**RYAN**  
TURF-CARE  
EQUIPMENT

OMC-Lincoln, a Division of  
Outboard Marine Corporation  
6703 Cushman  
P.O. Box 82409  
Lincoln, NB 68501

78-CUR-1

the parent pre-emergent compound is an insoluble, thus nonburning.

Pre-emergents should be applied before the weed seed germinating season begins, which is usually in March, April or May depending upon that portion of the country. Preemergent chemicals can be tank mixed and sprayed as a wettable powder or can be applied with a granular carrier as a spreader.

It is obvious that wettable pre-emergent powders will not present a phytotoxic problem at the

## The tank mixing of two or three soluble postemergent herbicides is becoming more and more prevalent.

time of application. However, some preemergents will release the toxicant rapidly and pose a phytotoxicity to certain types of grasses such as bentgrass. Some applicators will split the rate of application of a preemergent wettable powder in half when treating bentgrass greens and put on two applications a month apart.

The problem of phytotoxicity is an important factor when dealing with soluble postemergent herbicides. As a general rule, the phytotoxicity index (safety factor) is narrow for all postemergent chemicals. Yet they are used rather extensively and effectively, provided the rates of application are followed closely. The tank mixing of two or three soluble postemergent herbicides is becoming more and more prevalent. This practice is useful because the applicator has found a synergistic ef-

fect with combination; but, in doing so he must again apply rule number 2 which states that whenever solubles are added to the spray tank the dosage rate should be cut proportionately, depending upon the number of solubles.

Surfactants or wetting agents should be treated as solubles. Wetting agents are usually added to the spray tank in order to reduce the surface tension of water so that the spray comes out as finer droplets and wets the blades of the weeds or grasses giving a more uniform coverage. This also reduces the safety factor of soluble herbicides and promotes phytotoxicity. If a wetting agent is used, apply Rule No. 3. Cut the rate of the soluble herbicide. When used with insoluble fungicides, it is not necessary to reduce the rate.

Finally, there are two classes of chemicals which are infrequently used by applicators and by their very nature cannot be tank mixed. They are nematocides, such as Dasanit and Nemagon, and general weed and grass killers such as Phytar, Paraquat and Roundup.

When the applicator embarks on a new formula it would be wise for him to practice on small areas, preferably his nursery.

Also, according to the federal Environmental Protection Agency, if a chemical applicator willfully uses more than the recommended amount on the label and destroys turf, he is technically criminally liable.

But we are addressing ourselves to applicators who are faced with multiple diseases and multiple weeds. In this situation, one single product is inadequate, and it becomes costly and somewhat ridiculous to spray each individual product separately. But never apply more than the amount recommended on the label, and following the rules outlined in this paper, it is necessary to split dosages of solubles.

### Solubility and Formulation

EC, S, SP Solubles		WP, F Insolubles	Soluble-Insoluble Combinations
<b>FUNGICIDES</b>			
PMAS		Tersan 75	Calo-Clor
Caddy		Tersan LSR	Kromad
Cadminate		Tersan SP	Actidione RZ
Actidione TGF		Spotrete	Actidione Thiram
		Bromosan	Thimer
		Spectro	Cadtrete
		3336	
		1991	
<b>INSECTICIDES</b>			
Dursban	Malathion	Diazinon	
Diazinon	Proxol	Dursban	
Chlordane	Dylox	Sevin	
Sevin		Malathion	
<b>HERBICIDES</b>			
2,4-D	DSMA	Dacthal	
2,4,5-T	MSMA	Tupersan	
MCP	AMA	Balan	
dicamba	Betasan-EC		
<b>FERTILIZERS</b>			
urea		ureaform	
ammonium nitrate		IBDU	
ammonium phosphate			
ammonium sulfate			
potassium nitrate			
muriate of potash			

# There are 785 different tree species...



## And they all thrive on **Ross Super Tree Stakes** and **Ross Super Fruit Tree Stakes!**

Dependable **Ross Super TREE STAKES** provide once-a-year feeding of trees, shrubs, and evergreens with a high food value analysis of 16-10-9 PLUS iron and zinc formulation.

New **Ross FRUIT TREE STAKES** contain 16-5-10 PLUS iron and zinc to provide precise, pre-measured feeding of all fruit trees: apple, pear, apricot, plum, peach, cherry, all citrus, berries and fruit bearing shrubs.

Each commercial case contains approximately 155 stakes . . . enough to feed more than 35 trees of 3" diameter. There are 20 solid nylon pounding caps to simplify driving into the toughest soil.

For best results, place stakes at drip line of tree, using three stakes for every 2" of trunk diameter. Water does the rest, carrying plant food to the feeder roots.



Two great once-a-year formulas . . .

- 16-10-9 For Beautiful Trees & Evergreens
- 16-5-10 For bigger, better Fruit

Contact your nearest Ross Daniels distributor for Ross Super Tree Stakes and Ross Super Fruit Tree Stakes. If unavailable in your area, order direct from: ROSS DANIELS, INC., P.O. Box 430, West Des Moines, Iowa 50265. Use this coupon to order.

### ROSS Super Tree Stakes

Commercial Pack,  
 Stock no. 1791  
 Please ship \_\_\_\_\_ cases,  
 check enclosed.

Approximately 155 stakes per case, weight 44 lbs.

1-3 cases, \$35.00 per case  
 4-11 cases, \$30.00 per case  
 12 or more cases, \$25.00 per case

Each case includes  
 20 Nylon Pounding Caps

Your name \_\_\_\_\_

Organization \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Make check payable to Ross Daniels, Inc.

### ROSS Fruit Tree Stakes

Commercial Pack,  
 Stock no. 1812  
 Please ship \_\_\_\_\_ cases,  
 check enclosed.



# HIRE THE INSECTICIDE THAT LIKES TO WORK OVERTIME.



DURSBAN\* brand insecticides provide unsurpassed residual control of cutworms, chinch bugs, sod webworms, and a dozen other turf pests. Both DURSBAN 2E Insecticide and double-strength DURSBAN 4E Insecticide keep working a lot longer than other turf insecticides. This residual action saves you time, trips, and labor. It also saves you money. In fact,



DURSBAN insecticides cost less than most other turf insecticides.

Ask your supplier for the turf insecticide that works overtime for you. Get DURSBAN 2E Insecticide or double-strength DURSBAN 4E Insecticide. Just be sure to read and follow all label directions and precautions. Agricultural Products Department, Midland, Michigan 48640.

\*Trademark of The Dow Chemical Company



DOW CHEMICAL U.S.A.



# WE WROTE THE BOOK

When it comes to landscape irrigation, we wrote the book! Weather-matic systems are used around the world to provide a cost-effective way to water residential grounds, parks, green belts, athletic fields, golf courses, highway medians and other landscaped areas requiring irrigation.

Tough, dependable, field proven Weather-matic products are installed and serviced by a worldwide network of

local Weather-matic distributors and dealers.

For the name of your nearest Weather-matic distributor or dealer; to order our book (the Turf Irrigation Manual); or to get information on Weather-matic systems, call us in Dallas: (214) 278-6131. Weather-matic Division Telsco Industries; Box 18205 Dallas, Texas 75218



The finest lawn and turf irrigation system for any landscaped area

**Weather**  **matic.**

# TIMING, RATE ARE CRITICAL FOR PREEMERGENCE HERBICIDES

by Robert C. Shearman, Ph.D.

Preemergence herbicides play an important role in turfgrass maintenance programs. Timing of application is critical in their effectiveness. They must be applied prior to weed germination or emergence. An application two weeks prior to anticipated emergence of the target weed is generally suggested. This allows sufficient time for the preemergence herbicide to form a chemical barrier at or near the soil surface. Susceptible weeds germinate, absorb the herbicide, and are killed.

Preemergence herbicides are commonly used to control weedy, annual grasses like crabgrass, goosegrass, and foxtail. Some are also effective in controlling annual, broadleaf weeds such as prostrate or spotted spurge. Effectiveness and longevity of control depends upon the (a) preemergence herbicide, (b) application rate and timing, (c) weed species, (d) environmental conditions, (e) soil type and reaction, (f) cultural practices and (g) microorganism activity. Before selecting a preemergence herbicide turfgrass managers should check with local researchers and specialists for the chemicals that perform well in their area, and for the appropriate rates and timing of application.

Preemergence herbicide application rate and timing are critical aspects for effective weed control. A threshold level of herbicide activity must be maintained past the period of germination for the target weed to obtain satisfactory results. Figure 1 illustrates this point. Herbicide I maintains a soil concentration above the threshold level past the period of weed germination. Herbicide I would give effective weed control, while, Herbicide II fails to maintain a satisfactory concentration throughout the germination period. Herbicide II would require more than one application to give effective control of the target weed. When weed pressure is heavy or the germination period is extended weed control is more difficult. A heavy initial application rate or more than one herbicide application may be necessary under these conditions. If herbicides are applied too early, the chemical barrier may break down and allow weed infestation to occur. In turn, if the herbicide is applied too late germination will have already occurred and ineffective weed control will result.

Preemergence herbicides offer definite advantages to turfgrass managers. They are beneficial in maintaining the integrity, quality, and function of

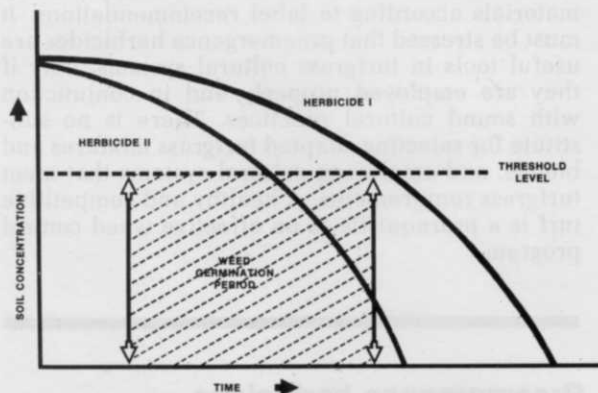


Figure 1. The preemergence herbicide must remain at sufficient concentration in the soil throughout the germination period of the target weed.

the turf; while they give effective and relatively safe selective control of emerging weeds. Preemergence herbicides, like other pesticides, have limitations and should be used appropriately. They cannot substitute for ineffective cultural systems, and must be incorporated with sound mowing, fertilizing and watering practices. Along with the advantages of using preemergence herbicides there are some potential disadvantages that should be considered. Some are rather obvious in nature. For instance, applications at the recommended rates for crabgrass and annual bluegrass will reduce germination of overseeded, cool-season turfgrass species. Reduced rates of siduron (Tupersan) is an exception, since it is recommended for seedbed application of certain turfgrass species and cultivars.

Other detrimental effects of preemergence herbicide applications appear to be more subtle in nature than the influence on seedling emergence. Almost every preemergence herbicide has been reported to influence some aspect of turfgrass growth, development, and performance. Successive annual applications or repeated applications within a year are particularly suspect. Decreased root and rhizome production, reduced sod strength and transplant rooting, reduced low temperature tolerance, increased high temperature and drought stress, and increased incidence of disease on susceptible turfgrass species and cultivars have been reported for the various preemergence herbicides commonly used in turf. However, these reports are contradictory and confusing since a particular herbicide may cause injury in one case and not another.

Turfgrass injury resulting from preemergence herbicides can usually be related to factors such as: (a) the species or cultivar treated, (b) herbicide used, (c) herbicide concentration or application rate, (d) soil type (e) cultural practices, and (f) amount of thatch present. These factors should be

---

**Dr. Shearman** is turf specialist and assistant professor of horticulture for the University of Nebraska, Lincoln. Shearman earned his graduate degrees in turfgrass physiology at Michigan State and his B.S. from Oregon State University. He is chairman of the Nebraska Turf Conference and a member of the Weeds Trees & Turf Board of Advisors.

---

## Preemergence Herbicides

given careful thought and equal consideration to the efficacy of the product, when reviewing a pre-emergence herbicide for use in a maintenance program.

The turfgrass manager should select the materials that appear safest and most effective based on research in his area, and apply these materials according to label recommendations. It must be stressed that preemergence herbicides are useful tools in turfgrass cultural systems, only if they are employed properly and in conjunction with sound cultural practices. There is no substitute for selecting adapted turfgrass mixtures and blends, and employing cultural systems that meet turfgrass requirements. A healthy and competitive turf is a prerequisite to an effective weed control program.

### Preemergence herbicides and their effect on thatch

Dr. Al Turgeon in the Department of Horticulture at the University of Illinois has reported extensively on the development of thatch due to preemergent herbicides and also the effect of thatch on the control of annual weedy grasses with preemergent herbicides. While some preemergent herbicides do induce thatch, it is more because of their effect as a pesticide on the earthworm and soil microbial balance.

Thatch results, according to Dr. Turgeon, because of an imbalance between opposing

processes of accumulation and decomposition of organic material. He suggests that where any chemical that induces thatch is used, a cultural program should be adjusted to compensate for the loss of earthworms and other organisms that are important in decomposing the thatch and generally improving soil physical conditions.

This may involve periodic verticle mowing, aeration, topdressing, or other practices to overcome the adverse effects of the chemicals on the turfgrass ecosystem.

In an experiment to determine the effect of thatch on preemergence herbicide activity in Kentucky bluegrass, Dr. Turgeon found that, while pre-emergence control was excellent on thatchy plots, there was some amount of turfgrass injury that was not as severe as on thatch-free plots. This may be due to at least two factors: Herbicides are more mobile in thatch than in soil, thus, as more herbicide enters the rootzone, more injury results; and since there were no observations of differences in mobility between benefin and DCPA, the selectivity of preemergence herbicides may be due to biochemical as well as mobility differences. The following chart indicates a comparison of crabgrass control on thatchy and thatch-free Kentucky bluegrass. Herbicides were applied April 24, 1976 and April 21, 1977.

Injury ratings were an average of observations made July 21, 1976 and July 18, 1977. They are based on a scale of one to nine, with one indicating no injury and nine indicating necrosis of turf.

The percentage of crabgrass cover is an average of visual observations made August 13, 1976 and September 8, 1977. The sites were overseeded with crabgrass each year.

*Continues on page 42*

**Effect of Thatch on Preemergence Herbicide Control**

Treatment	Form	Kg/ha <sup>1</sup>	Injury to Turf		Percent Crabgrass Cover	
			Thatch-free	2-3cm Thatch	Thatch-free	2-3cm Thatch
benefin	2.5G	2.2	1.0	3.0	5.3	1.1
		3.4	1.0	3.6	5.7	0.7
		4.5	1.0	4.6	2.0	0.1
bensulide	4E	11.2	1.0	1.1	4.7	0.1
		22.4	1.0	1.6	10.3	0.1
		11.2	1.0	1.6	1.6	0.1
		22.4	1.3	2.1	0.3	0.4
		11.2	1.0	1.0	2.0	0.6
DCPA	75WP	22.4	1.0	1.6	3.0	0.1
		11.8	1.0	1.0	2.6	1.1
		23.5	1.0	1.3	2.6	1.3
		11.8	1.0	1.1	3.7	1.3
		23.5	1.0	1.1	3.0	1.1
oxadiazon	2G	2.2	1.0	4.6	9.0	2.3
		3.4	1.0	5.6	2.8	0.0
		4.5	2.0	6.3	4.3	0.0
prosulfalin	50WP	2.2	2.0	2.1	6.0	0.2
		3.4	3.0	6.5	5.0	0.8
untreated			1.0	1.0	29.0	11.5
LSD 0.05 <sup>2</sup>			0.3	0.9	8.0	2.7

1. Kg/ha multiplied times 1.12 equals lb./A.

2. Level of Significant Difference, i.e. under Injury to Turf, Thatch-free, observation figures must differ by 0.3 to be significant, by 8.0 under Percent Crabgrass Cover, Thatch-free.





## Preemergence Herbicides

### Goosegrass control with preemergence herbicides

Dr. Wayne Bingham, professor of plant physiology at Virginia Polytechnic Institute and State University, included some aspects of his research on goosegrass control at the recent Virginia Turf-

grass Conference in Williamsburg, Virginia. While treatments for crabgrass control should go on in early March or early April, he said, goosegrass treatments should be delayed until May or even early June, when goosegrass germinates.

Dr. Bingham felt that his preemergent herbicide tests should be carried on for more than one

*Continues on page 47*

**Goosegrass Control in Common Bermudagrass Fairway**

Herbicide	Kg/ha					Percent Goosegrass Control		
	1974		1975		1976	1974	1975	1976
	4/16	9/5	4/3	8/20	4/12	9/5	6/22	8/26
Oxadiazon	3.4	1	3.4	3.4	3.4	100	100	100
Butralin or Prosulfalin	4.5	4.5	3.4	3.4	3.4	38	88	100
Bensulide or Butralin	11.2	11.2	11.2	11.2	4.5	0	0	38
Benfen	3.4	3.4	3.4	3.4	3.4	0	88	100
DCPA	16.8	11.2	17.9	11.2	17.9	50	38	62
Check	---	---	---	---	---	0	0	0

<sup>1</sup>Prosulfalin was applied 9/5/74 at 3.4 kg/ha.

# The Nursery Marketing Council Symbol — For Unrestricted Use by Every Firm Giving Voluntary Support

This is the symbol for NMC . . . the Nursery Marketing Council.

Whenever it appears in your advertising or catalogs, on your letterhead or invoices, or wherever else you let it be seen, it identifies your firm as a voluntary supporter of the professional, sales-directed, united, national marketing program for all the green industry.

Your printer can work with this page to reproduce the symbols in any of these sizes, or other sizes you may require. When you wish to use the symbol in a two-color version, the instructions will let your printer know what is recommended.

There may be times when you wish to give your readers some explanation for the symbol, and words something like this might be useful . . .



**For further information, contact:**  
Nursery Marketing Council  
230 Southern Building  
Washington, D.C. 20005

**Voluntarily supporting a strong  
national market for our products  
and services through the  
Nursery Marketing Council**



## NEW EXCEL HUSTLER 295 liquid-cooled engine puts industrial power on an industrial mower.

The same EXCEL HUSTLER mowers that excel in grounds maintenance maneuvers also come with a liquid-cooled industrial engine. The new model 295 offers superior performance and a long engine life with low upkeep and little downtime.

The only significant difference from the proven 275 and 285 is its liquid-cooled Continental engine, built in the USA, to Excel's specs for use on the new model 295. This industrial engine is not to be confused with automotive type engines commonly converted to mower use. Continental 2-cylinder liquid-cooled engine has long stroke and develops high torque at lower RPM. Powerful 2-cylinder engine is easier to maintain & service. Altogether, that's economy!

Like other EXCEL HUSTLER mowers, the new 295 is controlled with fingertip ease. Twin hand levers direct power independently to both drive wheels via dual hydrostats, with immediate response. The big 72" mower can make intricate twists and turns around trees,

signposts, park equipment — it even mows out corners with no time-consuming back-and-forth antics that mark ordinary mower operation. Crew chiefs report one problem: their operators argue over who gets to run the EXCEL HUSTLER, and who has to settle for conventional mowers!

Summed up, the new 295 is the same superior mower with more power than ever, and the full safety package. Attachments that stretch its working seasons the full year also interchange with all EXCEL HUSTLER models from 272A through 295.

Watch for a field demo or write for free literature and Distributor's name. Call toll-free (800) 835-3260; in Kansas or Canada, call (316) 327-4911 collect. EXCEL HUSTLER turf and groundskeeping equipment is built right by Excel Industries, Inc., Box 727, Hesston, Kansas 67062.

For GSA: GS-07S-03665

For HUD: OAH(CO)m 2635

**EXCEL HUSTLER**

**Turf Equipment**  
*There's a Difference!*

EXCEL INDUSTRIES, INC. Box 727 / Hesston, Kansas 67062 / (316) 327-4911 / (800) 835-3260

# Wherever annual weed

"Out here, crabgrass is our biggest complaint, and Balan in the spring works like a charm."



"Around these parts, we're faced with goosegrass/crowfoot in the summer, then when our Bermuda-grass goes dormant, Poa annua's the problem. So we use Balan twice."



"Sometimes we use Balan in the early spring for crabgrass, but if goosegrass is a problem we apply Balan later to get it as it germinates."



"If you've a goosegrass/crowfoot problem, a shot of Balan early in the summer takes care of that problem; but nothing makes our courses look worse than green patches of Poa after the Bermuda's gone dormant, so we apply Balan in the fall, too."

**...the  
solution  
is Balan**

The annual grass problems may differ from one part of the nation to another, but the solution is the same . . . Elanco's Balan. All across the country, Balan users have proven for themselves that a regular Balan program is their most effective means of controlling the hard-to-control annual weed grasses. Balan's granular form makes it as quick and easy to apply as fertilizer.

# grasses are the problem...

"Around here, our main problem is crabgrass in the fairways, so we use Balan in the spring.

"It's so economical we treat fairways and the roughs."



"Almost every course in the South has two main weed grass problems: Poa annua and goosegrass/crowfoot. Two applications of Balan gets rid of them both."



"Plain old crabgrass is the biggest problem around here. Balan is so economical we put it on all our fairways in the spring before germination."



Balan is the dependable, economical pre-emergent that kills weed grass seeds as they germinate, allowing the desirable grasses to fill in. Name your weed grass problems . . . crabgrass, goosegrass, Poa annua or foxtail. Balan's the practical solution. Order Balan from your Elanco Distributor today.

**ELANCO**

# Balan<sup>®</sup>

Elanco Products Company  
A Division of Eli Lilly and Company  
Dept. E-455  
Indianapolis, Indiana 46206, U.S.A.

# The city that gave the job to JOBE.

Carson, California, is a city that takes pride in its appearance. Its 22 square miles include about 35,000 trees on public land, approximately 50% planted in just the past ten years. F. "Tuto" Iglesias, maintenance superintendent of the Carson Parks and Recreation Department, is pleased with tree appearance and growth since the city "gave the job to Jobe." He says, "For our tree maintenance in residential areas, we fertilize exclusively with Jobe's spikes. Easy application saves us money on equipment and personnel." Carson discovered another benefit using Jobe's spikes — water conservation. Says Iglesias, "We used to fertilize while watering trees. Since starting to use Jobe's, we save on water usage."



## Give the job to Jobe.

Whether your groundskeeping responsibilities extend over an acre or an entire city, use JOBE'S TREE AND SHRUB SPIKES to cut out extra work and give extraordinary results. Instead of expensive, time-consuming hole drilling, tree and shrub fertilization can be done easily by just one man with a hammer. Using JOBE'S spikes is like adding a gentle giant to your crew. They're a big improvement over old-fashioned methods.

## Trees thrive on 'Triple Five'!

A 5" diameter tree needs only five spikes, and can be driven into the soil in five minutes. Jobe's Spikes' exclusive patented binder makes them easy to drive into the ground and provides extended release of 16-8-8 fertilizer.

Call your Jobe's distributor to order spikes. Or order direct.

\$30 per case (105 spikes) prepaid, 5 case minimum. 15 or more cases, \$25 per case; 36 or more, \$22.50 per case.

Also try Jobe's Evergreen Spikes (12-6-8) and Fruit Tree Spikes (5-15-15).



**Jobe's**  
...the big  
tree maker

**Jobe's**  
**TREE & SHRUB SPIKES**

The easy method for professional tree care.

International Spike, Inc., P.O. Box 1750, Lexington, KY 40593

## Preemergence Herbicides

year for a good evaluation of control. Variability between locations became a factor.

When the new herbicides began to show up and their effect on goosegrass control showed them to be important, they were looked at and critically compared to find which had the best results. Dr. Bingham found that if he split application, control was better.

Oxadiazon, however, seemed to work just as well whether it was applied all at once or split. With DCPA, bensulide and benefin, better results were achieved with a split application.

The following charts show a comparison of goosegrass control over a three year period, the first indicating control and the second indicating the amount of bermudagrass filling the plots back in.

**Goosegrass Control in Common Bermudagrass Fairway**

Herbicide	Kg/ha <sup>1</sup>					Bermudagrass ground cover <sup>2</sup>				
	1974		1975		1976	1974	1975		1976	
Oxadiazon	4/16	9/5	4/3	8/20	4/12	4/16	5/30	7/22	6/14	8/26
Butralin or Prosulfalin	3.4		3.4	3.4	3.4		104	132	137	144
Bensulide or Butralin	4.5	4.5	3.4	3.4	3.4		108	127	122	143
Benefin	11.2	11.2	11.2	11.2	4.5		69	79	117	132
DCPA	3.4	3.4	3.4	3.4	3.4		115	127	131	144
Check	16.8	11.2	17.9	11.2	17.9		108	104	115	138
	---	---	---	---	---	33	43	72	83	122

<sup>1</sup>Kg/ha multiplied times 1.12 equals lb./A.

<sup>2</sup>144 square feet = complete coverage of the plot.

## Lawn Smooth, Rock Tough VEMCO Flail Mowers

Talk about versatile! The Vemco Flail Mower keeps parks, and other large lawn areas smooth and streak-free. It also cuts rocky, trashy areas where ordinary mowers cannot go.

Standard Series mowers, with 42", 48" and 60" widths, have many construction features usually found only on heavy-duty models. Heavy Duty Series, with 60", 72" and 84" widths are tougher yet. Rock Dodger blades swing free in all directions, are practically immune to breakage.

We urge you to compare a VEMCO with any other mower in its class. You'll see the difference and like it.

# VEMCO



VEMCO CORPORATION  
OF AMERICA

1331 23rd Street, Racine, WI 53403 • Telephone 414/634-6050

Circle 142 on free information card



## TURF EXPERTS . . .

FIESTA IS THE NEWEST  
OF THE IMPROVED  
TURF-TYPE  
PERENNIAL RYEGRASSES  
AVAILABLE TODAY

Today's professional turf manager recognizes the value of up-to-date turfgrass breeding and research. That's why so many are upgrading their programs with Fiesta.

Why not join them?

**PICKSEED** PICKSEED WEST, Inc.  
Box 888, Tangent, OR 97389 (503)926-8886

Circle 178 on free information card  
MARCH 1979/WEEDS TREES & TURF

# SCOTTISH GREENKEEPERS PRESERVE NATURAL CHALLENGE OF COURSES

by Stan Metsker

**Stan Metsker** made the trip to Scotland in September of 1977 to bring back ideas for the Country Club of Colorado where he is the Superintendent. For the last five years he has been working with architect Peter Dye, who designed and constructed the course, to develop some of the Scottish links atmosphere.



**Gorse at Gleneagle Golf Course.** The sharp-leaved gorse receives great respect from golfers and rarely gives back balls hit into it.

It is easy to see why Golf started in Scotland. The courses were there just waiting to be discovered. The dunes formed the contours, the grass was so starved that it was thin and easy to find a ball in, and the rabbits and sheep kept the grass down enough to form what later became mowed greens. Next to the sea (the links land) there are dunes of beachsand that provide so many possible natural golf holes that the biggest problem must have been in choosing which way to lay out the course to the fullest advantage.

The old rules of golf called for the teeing area to be within two clublengths of the previous hole. Even now, the next tee may be almost that close to the edge of the just completed green. This contributes to fast play in Scotland where everybody walks.

All the courses are not maintained alike nor do they look alike. The manufactured look of American courses can be found, but it is the exception. The maintenance of these courses is quite different from that in the U.S. Greenkeeper Norman Ferguson of Troon Golf Club uses the following methods:

- Fertilize with nitrogen only, once in spring and once in summer.
- Mow fairways once per week.
- Mow greens three times per week when growing well, twice when slower.
- Change cups once per week.
- For insects use DDT or Chlordane.
- After aerifying greens, topdress Turface into low spots and compost into high spots.
- Irrigate only enough to make the grass survive dry periods.

Like most other Greenkeepers in Scotland he has no triplex greens mowers, no power trap rake or trucksters. He does have some automatic irrigation of greens and, even more rare, some automatic irrigation on the fairways. As with other courses, one of his big continuous problems is rabbits. They are forever digging holes.

To understand the vegetation of a links course you must remember that the "soil" is almost pure dune sand and that the weather is that of an island (high humidity) on the same latitude with the Hudson Bay in Canada, Southern Alaska, and Southern Sweden. The climate is generally cool, windy and frequently rainy. But, there are occasional droughts.

These infertile, acid, and fast draining soil conditions call for some pretty tough plants. Gorse (*Ulex europaeus*) is the most abundant and most respected bush. It is full of spine and is impossible to walk through. It blooms in the Spring and has pods that snap open on sunny fall days. It grows from a few in. to six ft. high and often is mixed with brambles such as blackberries. Gorse is often seen on the top of the dunes.

Heather (*Culluna*) grows in clumps very close to



# FOR THE RECORD:

**We broke new ground for  
corrugated plastic drainage tubing  
by breaking old precedents.**



When we originated U.S. marketing of corrugated plastic drainage tubing in 1966, we recognized its applicability to virtually every area of drainage need—farms, highways, construction projects, septic fields, grounds maintenance, golf courses, etc.

To prove the value of plastic tubing in a wide range of drainage applications we worked with, cooperated with, shared our technical knowledge with the specifying, testing and code-writing community. And we kept developing our

product line to meet the needs of different users.

Today, we serve all these markets, and more; through continuing new product development; production capability second to none; and the most extensive overall sales and manufacturing supply network in the industry.

When you specify ADS products, you get everything you'd expect from the company that's been marketing corrugated plastic drainage tubing longer than anybody else in the U.S. That's how leadership is earned.

**ADS green**

...number 1 in the land.



Circle 171 on free information card



Corporate Office  
3300 Riverside Drive, Columbus, Ohio 43221 (614)457-3051

23 Sales and Manufacturing Locations to Serve You. **California** Pomona (714)627-1591 **Georgia** Atlanta\* (404)393-0602 Montezuma (912)472-7556 **Illinois** Harvard (815)943-5477 Monticello (217)762-9448 **Indiana** Farmland (317)468-8402 **Iowa** Cresco (319)547-3105 Creston (515)782-8565 Eagle Grove (515)448-5101 Iowa City (319)338-9448 **Kentucky** Livermore (502)733-4324 Versailles (606)873-8046 **Massachusetts** Palmer (413)283-9797 **Michigan** Owosso (517)723-5208 **North Carolina** Rowland (919)422-3303 **Ohio** Napoleon (419)599-9565/(419)599-0585\* Wooster (216)264-4949 **Tennessee** Brentwood\* (615)373-0133 **Texas** Ennis (214)875-6591 **Virginia** Buena Vista (703)261-6131 **Washington** Bellevue\* (206)454-7370 Washougal (206)835-8522 **Madera** (Open Early 1979) (209)674-0054/(209)674-0645\*



**North Berwick 16th Green** (above) is formed by two plateaus which makes for some interesting putts. Worker (below) uses an alder broom to brush debris off a Gleneagle green.



the ground, usually less than six in. high. It blooms in late summer and early fall with the purple flowers making a living carpet. A golf ball can often be found in heather but the stroke to get it out is difficult due to the plant's wiry nature. It does well on hillsides.

Broom (*Cytisus*) is common but seems to be scattered as an individual plant among the more common gorse. It has almost no leaves, hence its name. It grows about three ft. high and has beautiful pea-like yellow flowers in the spring.

Roses are common but often they are the small creeping types and grow in with the grasses. Trees are almost non-existent. Occasionally there is a small maple or a wind swept hawthorn. Trees are not necessary to have a good golf course as is evident at the courses at St. Andrews Links.

Common Sea Buckthorn (*Hippophae rhamnoides*) is not seen as often as gorse but on some courses makes large clumps of brush that are 15 ft. high and almost impenetrable. It has a nice gray-green color and spreads by suckers.

The grasses are mostly fine leaved fescues mixed with some bent and sometimes a little *Poa annua* where there is close mowing. The rough is generally thin and easy to find a ball in, even if the seed heads may be as high as six or eight inches. The fairways are also thin and often there is moss on the ground. Divots fill in very slowly, so it is a common practice to "sand" the divots. Seed is not usually included in the "sand" because dry winds often will kill the young seedlings. There was some evidence of overseeding on fairways.

Due to a prolonged dry period and the lack of a water system, some fairway grass had been lost

# LAKESHORE SELLS LESCOSAN!



... And Lescosan is outselling other pre-emergence crabgrass controls.

But we can't take all the credit. Lescosan sells itself.

Other companies claim to have the answer to pre-emergence crabgrass control. At Lakeshore, the undeniable proof exists in every application of Lescosan, whether it's Lescosan 4E emulsion or Lescosan 12.5 granules.

Lescosan (Betasan\*) provides full-season effectiveness on all grasses, as well as a number of ornamentals and ground covers. And when you buy Lescosan from Lakeshore, you buy from the formulator. And that means quality and savings!

"Call me today on one of my toll-free numbers," — Barb East of the Mississippi 1-800-321-5951 In Ohio, Dial 1-800-362-7413 Or, Call Collect 216-323-7544

**If Lescosan is selling itself to you, call Barb and take advantage of our toll-free information service.**

Those east of the Mississippi can reach her by dialing 1-800-321-5951. (In Ohio, dial 1-800-362-7413.) If you're west of the Mississippi, call Barb collect at 216-323-7544.

She'll have our representative contact you so you'll know what Lescosan can mean to you and how our other fine LESCO Products (including LESCO 36 Sulfur Coated Urea) are selling themselves every day!

**Our LESCO Quality Products and Friendly Service are always as close as your phone.**

## LESCO PRODUCTS

Div. Lakeshore Equipment & Supply Co  
300 S. Abbe Road  
Elyria, Ohio 44035

A Family of Fine Products:

Lescosan 12.5G — Lescorene — Lescos 4 — Lescobor — Lescopar — Lescopex — Lescos Non-Selective Herbicide  
Lescos MSMA — Lescos Thiram 75W — Lescoszyme — Lakeshore Chinch Bug & Sod Webworm Control

## Scotland



**English Hawthorn** tree (above) on St. Andrews Golf Course shows effects of high winds and blowing sand, characteristics of the links area of Scotland.

**Sod wall trap** (left) on St. Andrews keeps sand from eroding away.



during my visit. At St. Andrews where fairway aerifying had been done, the golfers were playing preferred lies. Greenkeeper Walter Wood explained to me that the Royal and Ancient Golf Club did not have much to say about this rule being used on the course because all four courses at St. Andrews are owned by the people of the City. Walter mentioned that he had a rather large sod nursery.

Sod is used in large quantities when traps are built or rebuilt. The sod wall faced trap is the rule, not the exception. With the soil being so sandy it is the only practical way to hold a steep bank. Many of the bunkers are small and are sunken below ground level to the point that hand raking is the only way to care for them. No rakes are left on the course for golfers to use.

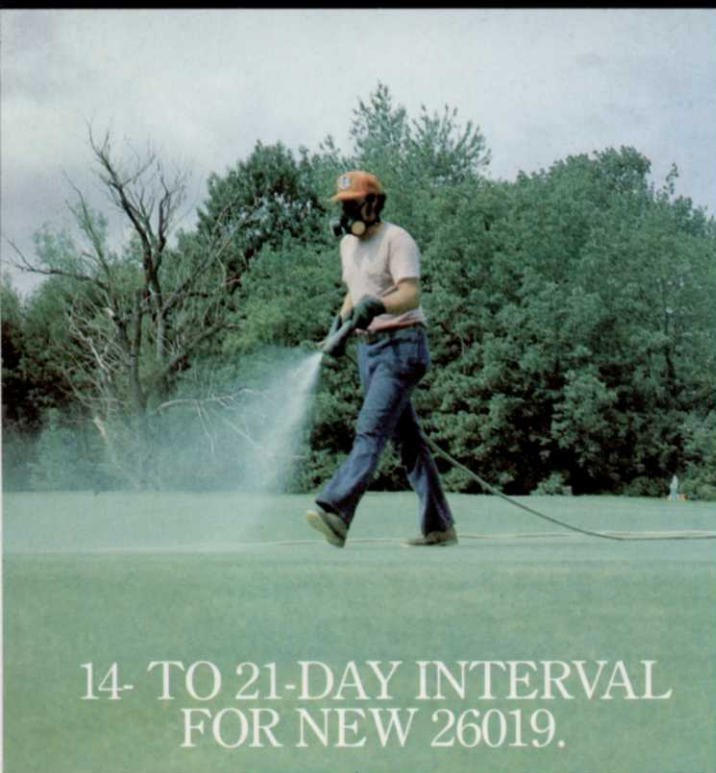
Golf in Scotland is for everyone not just the rich. With about the same area as the State of Maine, Scotland boasts over 350 golf courses. Many are available to the residents for free or a small fee. It does not cost very much by U.S. standards to maintain a course there. While they are trying to maintain their courses as they have always been,

we in America are striving for a very high standard of excellence. The important difference of their not having motorized golf cars cannot be overlooked in regard to maintenance. Any golf course that must stand the wear and tear of golf cars must be watered and fertilized more in order to take it, however most of us are guilty of overmaintaining areas that are not in play.

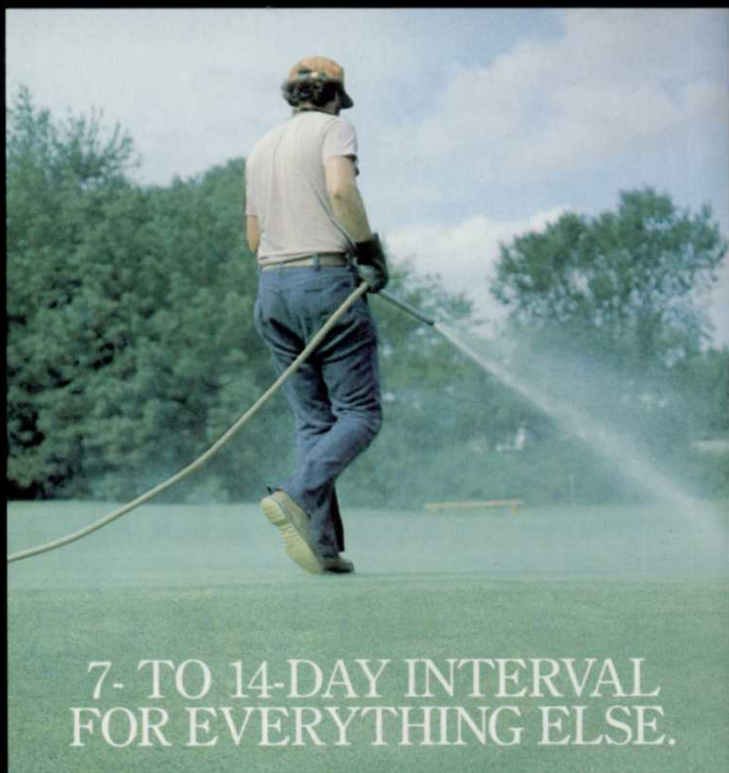
Because Scotland is the home of golf, it would be good for any course superintendent to visit there to see the original golf courses from which our present day golf course has evolved.

**WTT**

**INTRODUCING  
A NEW TURF FUNGICIDE  
THAT WILL OUTPERFORM  
ANYTHING ELSE YOU CAN USE,  
WITH ABOUT HALF  
THE NUMBER OF SPRAYS.**



14- TO 21-DAY INTERVAL  
FOR NEW 26019.



7- TO 14-DAY INTERVAL  
FOR EVERYTHING ELSE.

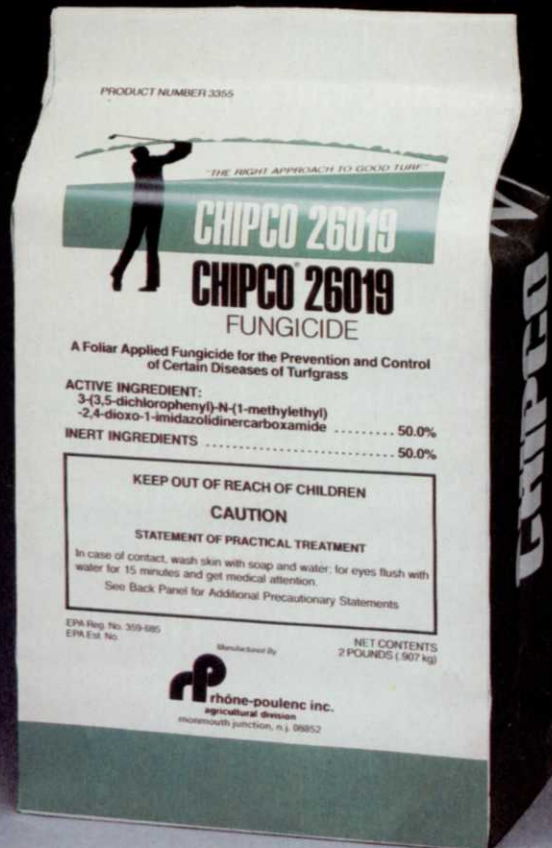
Here's a new fungicide that could change your whole way of thinking about broad-spectrum fungus control *and* spray intervals. Because new Chipco 26019 gives more control with fewer sprays than any of the old fungicides you've had to use.

It stops the major turf diseases—dollar spot (including benomyl-resistant dollar spot), brown patch and Helminthosporium (leaf spot). And it does it for up to three weeks, at low, economical rates.

It's a nice material to handle, too. It's very soluble, and mixes well, with no residual left in the tank. It also presents no problems of phytotoxicity to turf.

Last year was a wet one, with unusually high disease pressure in most areas. Yet, Chipco 26019 performed beautifully in wide-spread tests. This year, you'll have the chance to see how well it can perform for you. So ask your chemicals distributor for this welcome addition to the popular Chipco line of turf fungicides and herbicides. It will outperform anything else you can use, with about half the number of sprays.

# NEW CHIPCO 26019 (IT LASTS UP TO 21 DAYS).



# "YOU FOLKS HAVE SOMETHING GOOD HERE."

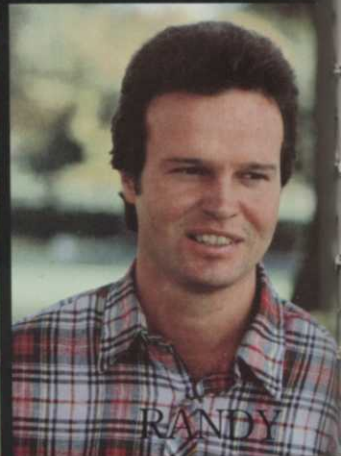


BOB



PAUL

JOHN



RANDY

"The main reason I'll use Chipco 26019 is to control dollar spot. Picking up brown patch and the others is gravy, as far as I'm concerned. This is a real good new chemical."

—Bob Dickison, golf course superintendent  
Upper Montclair Country Club, Clifton, N.J.

"I feel very good about this product. We tested it during one of the roughest summers in my memory. I think, over a 14-day period in August, we had very close to 10 inches of rain. It was an acid test for the material. These chemicals come and go, and some of them are short-lived. But you folks have something good here. The sprayability of Chipco 26019 is very impressive. And you only need six to 10 hours of drying time, which helps a lot during rainy periods. Some other materials require at least 12 hours."

—Paul Boizelle, golf course superintendent,  
and John Fenwick, foreman,  
Fiddler's Elbow Country Club, Far Hills, N.J.

"We started using Chipco 26019 in June of 1977. Before we started using it, we had very little luck with our other contact and systemic fungicides in certain areas. We were applying some contact fungicides at preventative and curative rates, and still only getting two or three days control, with the usual cold fronts coming through, followed by large outbreaks of dollar spot. Since we started using Chipco 26019, we haven't found dollar spots in these areas at all."

—Randy Wahler, golf course superintendent  
Glen Flora Golf Course, Waukegan, Ill.

Rhône-Poulenc Inc. Agricultural Division, Monmouth  
Junction, New Jersey 08852.

Please read labels carefully, and use only as directed.

  
rhône-poulenc inc.



# GCSAA WINTER CONFERENCE REPORT SESSIONS, SHOW DREW OVER 6000

The 50th International Turfgrass Conference and Show in early February had all the elements of a successful trade show, a fantastic location in Atlanta's Georgia World Congress Center, more than 6,000 attendants and 200 exhibitors, good hotels, and a speaker program kicked off with a strong motivational speech. Add the organization and service of the Golf Course Superintendent's Association of America staff and the net effect was a model trade show.

It was obvious that GCSAA had made changes from previous shows to provide a more responsive program. Technical subjects were simplified, superintendents took on a bigger share of the speaking role, and special interest topics were broken out from the rest of the sessions. The exhibit floor allowed more room for delegates to see booths and relax. Transportation from hotels was very convenient.

Session topics included landscaping, water and effluent, fertigation, turfgrass improvements, root-zones, personnel management, composting, and diseases. Sand topdressing was one of the most controversial topics. Three superintendents described their experiences with sand topdressing. Ray Knapp of Tuckaway Country Club in Franklin, WI, has found regular light topdressing with sand provides a considerable amount of sand over a year's time and eliminates thatch problems. Knapp has all but eliminated aerification of greens and



Engel

Miller

has reduced application of fungicides because of the topdressing program.

George Burgin of Atlanta Country Club started using sand topdressing to correct compaction problems and to reduce aerification from five times per year. Burgin stopped his topdressing when he noticed while cutting cups, that the root system extended only into the sand and not below. Burgin said, "Sand topdressing may be necessary under poor soil conditions, otherwise leave a good thing alone."

Reduced *Poa annua* population was one benefit of sand topdressing according to Charles Nolan of Inglewood Golf and County Club, Kenmore, WA. Nolan's greens were constructed in 1918 of organic soil and contain no drain tile. Nolan has adapted a topdresser so that a two-man crew can topdress all 20 greens in one morning.

Both Nolan and Knapp have customized their topdressers to improve speed of application and loading. Disturbing play with heavy applications is generally avoided by more frequent light topdressing.

How to live with rising water costs and drought was discussed by Jim Prusa of Pasatiempo Golf club in Santa Cruz, CA. Deciding where not to irrigate because of rationing, guarding against unscrupulous well drilling companies, and handling monthly water bills of \$12,000 for irrigation are just three of the reasons Prusa has been forced to make sacrifices at Pasatiempo. To compensate for the cutback in water usage, Prusa has increased aerification, sand topdressing of greens, mowing heights, hand watering, efficiency of irrigation system, use of native plants in the landscape, and use of drip irrigation. The biggest move is to arrange the use of effluent water under a publicly funded project. Not only will the state and federal governments pay the brunt of the installation cost, but Pasatiempo's water rate will be reduced by two thirds.

Effluent water must be checked for salt content and other factors which can affect plant growth. Dr. Wade Berry of the University of California, Los Angeles, suggested USDA Handbook No. 60 for ac-

Tadge



Nugent



Funk





# BIG JOHN: Big Trees, Big Profit.

- Fastest transplanter available.
- 78" width handles 7000 lb. root ball.
- BIG TREE transplanter returns investment quickly.

Prospectus of investment plus demonstration without obligation. Inquiries invited:

Gerald Bredlau  
5362 Clarice Circle  
Stevens Point, WI 54481  
Telephone (715) 341-2895



**big trees  
today inc.**

*Dealerships available in select areas.*

Circle 182 on free information card

ANOTHER FINE PRODUCT FROM DEDOES

## Dedoes Plow

FOR THE

## Toro Sand Pro



When you add the hand operated sand plow to your Toro Sand Pro, you will notice it's usefulness without noticing the price.

Rugged and simply engineered, it is effective in moving sand or leveling cart paths. It can be easily attached and should be a part of each Sand Pro.

Contact your local Toro distributor for details.

Circle 123 on free information card

ceptable levels of salts in effluent water. Berry said effluent usually contains desirable elements like phosphorus and potassium, but that these chemicals will also encourage algal growth in ponds and streams and possibly on grass.

Richard Nugent of Killian and Nugent, Palatine, Illinois, said the government will allow up to 85% percent financing for distribution of effluent on land. Any system using effluent water, however, must contain storage facilities since sewage plants work all year and seasonal contracts are less attractive. Other considerations are good drainage to help leach out toxic metals, odor in early spring, and education of the golfer to the use of effluents.

Dr. Ralph Engel, professor of turf science, Rutgers University, New Brunswick, NJ, showed that ideal root growth conditions are not also ideal for appearance in bentgrass. One to three waterings per week with good soil penetration should be sufficient, Engel stated. Syringe as needed and provide proper drainage. Watering practices can effect varieties dominating. Bentgrass requires the most water, turf type ryegrasses require more than bluegrasses.

Dr. Houston Couch, author and professor of plant pathology at Virginia Polytechnic Institute, described basic characteristics of pesticide carriers. Couch said data is lacking on the effect of the amount of water carrier in a mix. However, it is known that pH of the water carrier affects the length of time a mix can be stored and remain effective. Couch said strong alkaline water will deactivate fungicides. Basically, wettable powder forms of fungicide require less material and perform more quickly and more effectively than granular forms. However, Couch said systemic fungicides have greater potential when applied in granular form.

ChemLawn Vice President Robert Miller said the pH of the water carrier can reduce the effectiveness of dylox from days to an hour. Miller said timing incompatibility also exists, such as combining a preemergent herbicide with a broadleaf contact material.

Miller made these suggestions for mixing pesticides:

- never mix pesticides in concentrated form
- never mix organic fungicides with fungicides using xylene as a solvent
- place wettable powders in tank first, the flowables, water soluble powders, surfactants, and emulsifiable concentrates.
- do jar test and test plot when possible
- when mixing pesticides with soluble fertilizer use urea in preference to other water soluble fertilizers.

Dr. Reed Funk, research professor of turfgrass agronomy at Rutgers University received GCSAA's Distinguished Service Award for his work with turfgrass breeding. Dr. Funk's program is one of the most extensive and productive in the world. A considerable amount of variety improvement and testing has taken place under Funk's direction.

Charles Tadge, superintendent of Mayfield Country Club in South Euclid, OH was elected president of the Association. Melvin Lucas, superintendent of Piping Rock Club, Long Island, N.Y. is the new vice president.

The 1980 GCSAA Show is set for St. Louis. **WTT**

## ALCA honored by Houston Mayor Houston Landscape Week proclaimed

February 4-10 was proclaimed Houston Landscape Week by Mayor Jim McConn in honor of the 1979 Associated Landscape Contractors of America meeting. McConn noted three worthy characteristics of landscape contractors in his proclamation: "WHEREAS, the natural living environment is the basic environment of human life, in which all people function; and WHEREAS, the landscape contractor, in his daily work, installs, enhances, and maintains the natural, living environment; and WHEREAS, the leading landscape contractors from throughout the United States and abroad are assembling in Houston. . ."

### Election of officers

Bill Thornton, Jr., a principal of Thornton Environmental Industries, whose main responsibility is for Thornton Landscape, Inc., was named the 17th president of ALCA. Thornton resides in Cincinnati, Ohio.

President-Elect is Wallace SaBell. He is president of SaBell's, Inc., in Lakewood, Colorado.

Other officers elected include vice presidents Ritchie Skelton, president of Duncan Landscape Associates of Vienna, Ohio, and Allen Keesen of



William G. Thornton, Jr.

Allen Keesen Landscape, Inc., Denver, Colorado.

The treasurer is Ray Gustin III, Gustin Gardens, Inc., in Gaithersburg, Maryland. David Pinkus, North Haven Gardens, Dallar, Texas, is the secretary. Ron Ahlman is the Immediate Past President.

The new officers will serve until the next meeting in February of 1980.

### Awards

The Ninth Annual Environmental Improvement Awards were announced and some nineteen projects recognized at the meeting. The awards are made each year in three classifications: Environmental Grand Award, Merit Award and Award of

## If it's New . . . If it's Innovative, it's built by TORCO!



TS 1250

TORCO Sprayers are unique in agitation, trouble-free performance, and longer life. Versatile pumping equipment handles liquids and slurries, herbicides, insecticides, fungicides and fertilizer (liquid & granular). ONE SPRAY UNIT DOES IT ALL — turf, foliage and dormant spraying, root feeding, hydro seeding.

*Designed for easy and simple operation!*



**TORCO** EQUIPMENT  
COMPANY

207 EILER AVE.  
LOUISVILLE, KY. 40214



TF 300

- 300 gal. skid units for pick-up trucks.
- 200 gal. skid units for golf course vehicles.

*Call for information and brochure:*

**800/626-1818**  
502/366-1415 (collect in Ky.)

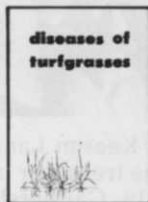
# Technical and Instructional Books



## TREE SURGERY

Tree Surgery, A Complete Guide, gives an up-to-date account of modern tree surgery operations. The theory behind acquiring the skills and knowledge necessary to perform competent tree surgery is outlined clearly and precisely.

**\$15.00**



## DISEASES OF TURFGRASSES

Couch's Diseases of Turfgrasses is one of the best references on that subject to date. No turf library is complete without it. It provides an in-depth analysis of turfgrass disease causal organisms and control of them. From diseases caused by pathogenic plants to viral turf diseases, Couch presents information necessary for any plantsman to achieve fine turf.

**\$27.00**



## WOODY LANDSCAPE PLANTS

Manual of Woody Landscape Plants is a valuable reference for anyone interested in woody plants. The book provides concise, factual information on common and not-so-common woody ornamentals, ground covers and vines as well as the narrowleaf and broadleaf evergreens which are adapted to Midwestern and Eastern climates.

**\$19.00**



## TREE MAINTENANCE

Tree Maintenance is an indispensable guide to anyone involved with the care and treatment of trees. All phases of tree care are described in non-technical language. The book includes a comprehensive list of effective and safe pesticides for trees.

**\$25.00**



## GUIDE TO TREES

Simon & Schuster's Guide to Trees provides beginner and expert with a reference to 300 trees. Black and white line drawings and 350 color photographs accompany descriptive text on each tree, including etymology, habitat, description, propagation, and conditions for growth.

**\$17.00**



## TREE FARM BUSINESS MANAGEMENT

Tree Farm Business Management covers all phases of a tree farming operation, from obtaining an accurate timber inventory to timing sales for profitable results. Budgeting, preparing scientific financial forecasts, special tax problems, and other financial matters are given thorough coverage.

**\$16.00**



## DISEASES OF SHADE TREES

Diseases of Shade Trees is an excellent introduction to tree diseases, including infectious and noninfectious. Part III, Special Topics, covers nonpathogenic conditions, disease diagnosis and living hazard-trees. The book describes the theory and practice behind maintaining a healthy tree that serves a positive purpose.

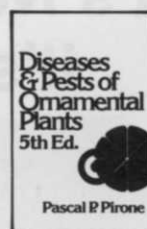
**\$22.00**



## SOIL MICROBIOLOGY

The second edition of Soil Microbiology integrates microbiology, soil science, and biochemistry to characterize soil microflora. The revised edition adds a closer scrutiny of environmental problems, information on soil toxicants formed by microorganisms, and a chapter on microbial metabolism of pesticides.

**\$19.50**



## DISEASES & PESTS OF ORNAMENTAL PLANTS

Diseases & Pests of Ornamental Plants, fifth edition, includes new ornamental disease hosts, identifies new diseases, and describes the spread of known diseases to a wider range of host plants. The book keynotes environmental factors adverse to the health of 500 ornamentals.

**\$19.00**

**Weeds Trees & Turf  
Books Dept./Fran Franzak  
9800 Detroit Ave.  
Cleveland, OH 44102**

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Quantity	Title	Unit Price	Total
_____	Guide to Trees	\$17.00	_____
_____	Soil Microbiology	\$19.50	_____
_____	Diseases & Pests of Ornamental Plants	\$19.00	_____
_____	Tree Surgery	\$15.00	_____
_____	Tree Farm Business Management	\$16.00	_____
_____	Tree Maintenance	\$25.00	_____
_____	Diseases of Shade Trees	\$22.00	_____
_____	Manual of Woody Landscape Plants	\$19.00	_____
_____	Diseases of Turfgrasses	\$27.00	_____
		<b>Total</b>	_____
		Shipping & Handling Chg. (\$1.25 per book)	_____
		<b>Total Payment Enclosed</b>	_____

Distinction. The entries are judged on a regional basis.

The Grand Award, the highest, was presented for the following projects:

Deere & Company Interior Atrium (Interiorscape, Region IV) Tropical Plant Rentals, Inc. Prairie View, Illinois

Hilltop Park (Landscape Contracting, Region I) A&J Shooter & Associates, Mountain View, California

Kriss Residence (Design/Build, Region VI) Alley Pond Nurseries, Huntington, Inc., Melville, New York

Peninsula Office Park (Maintenance, Region I) Green Valley Landscaping Inc., San Jose, California

Small Residence (Design/Build, Region VII) Green Brothers Landscape Company, Inc. Smyrna, Georgia

William Lackey Residence (Design/Build, Region III) Landscape Associates Inc., Little Rock, Arkansas

The award winners were selected from 90-plus entries by a panel of three judges: Jot Carpenter, president of the American Society of Landscape Architects; Kent Slepika, director of the American Society of Interior Design; and Dale Manbeck, president of the National Landscape Association.

#### Trade show

All of the leading landscape suppliers were set

up to exhibit their products Tuesday in the Galleria Plaza Hotel's exhibit hall. A unique new ALCA program features an equipment demonstration.

Held on a bare-earth field next to the hotel, equipment manufacturers demonstrated their equipment in actual operation. Spray equipment sprayed, diggers dug, and those attending saw "the whole thing".

#### Education

A number of excellent speakers complimented the ALCA program. Dick Semann gave a fantastic presentation of "Communicate to Motivate". By the time Semann had reviewed the process of motivation, including effective goal setting and new concepts of motivational management within the landscape contracting field, everyone was truly "motivated to communicate".

Specialty workshops began on Thursday with sessions for interiorscape, maintenance, insurance, public relations and erosion control and revegetation. The sessions continued on Friday morning and a session for the rapidly expanding lawn care industry was added.

A record 683 landscapers attended the national meeting this year.

Those wanting to know more about the organization should write: Associated Landscape Contractors of America, 1750 Old Meadow Road, McLean, Virginia 22102.

## Cut It!

Cut your grass and cut your risks with Mott flail safe mowers. Under conditions wet or dry, Mott cuts and mulches everything from fine lawns to high weeds.

Cutting widths from 38 to 88 inches and gangs to 19 feet. Mott mowers have built-in Long Life Durability and for you this means Best Value Purchase.



**MOTT CORPORATION**  
514 Shawmut, La Grange, Illinois 60525. (312) 354-7220  
The Original Flail Safe Mowing System



Circle 109 on free information card



## MEDICAP MD

### The Efficient Way to Combat Nutrient Stress in Trees.



Combat nutrient stress by treating trees with MEDICAP MD Systemic Implants now. Then, when trees become active, they'll take full advantage of a special formulation of water-soluble, concentrated nutrients. MEDICAP MD releases nutrients directly into sap flow to promote dark, green leaf development and stimulate feeder root growth.

Small MEDICAP MD cartridges are applied easily in one step. They deliver a high nitrogen, phosphorus, potassium analysis, as well as iron, manganese and zinc.

Don't wait for trees to exhibit stress. Turn to MEDICAP MD now.

TREE SYSTEMS\*  
**MEDICAP**  
SYSTEMIC TREE CARE



**Creative Sales, Inc.**  
222 N. Park Ave.  
Fremont, Nebr. 68025  
(402) 727-4800

Circle 141 on free information card

# CALIFORNIA LANDSCAPER NURTURES PLANTS IN URBAN ENVIRONMENT



**Century City** in West Los Angeles was tagged a "modern Acropolis" by Time Magazine. This city within a city was meticulously designed to resemble what might be called the perfect metropolis — all the atmosphere and fast-paced excitement of a big city without the narrow alleys, dingy streets, and usual unpleasant characteristics of many large urban areas. It has developed into one of the most prestigious sections in the Los Angeles area both for businesses as well as luxury high-rise residential properties. One striking attribute that sets apart Century City is its beautiful landscape. Walkways, boulevard medians, and huge landscape beds are maintained with cosmetic precision.

The responsibility of keeping Century City, California, green is a complex full-time job that requires a unique problem-solving ability. Landscape supervisor John Zessau and his assistant Frank Valesquez are literally "on-call" 24 hours a day, seven days a week, to handle any landscape related dilemma that might arise in Century City. Zessau said it's not often that the job will require night calls, but if it does, "Frank and I can get to practically any location within 30 minutes from where we live . . . if a main irrigation line blows one of us is right there to handle it."

"That's one major advantage we have in our operation. We are able to provide a service that really can't be

*continues on page 67*

**All plants grow** in concrete beds above parking garages, including large coral tree.



# Green, Green, Greener

**THE BEST SEED SHOULD DO MORE  
THAN GROW GREEN GRASS**

ADELPHI Kentucky bluegrass has been chosen by the Plant Variety Protection Office in the U.S. Dept. of Agriculture as *the standard dark green color which all other bluegrasses applying for plant protection will be compared to.*

ADELPHI a first generation apomictic hybrid has been a *top performer in density, disease resistance, drought, heat, cold...and is completely free of noxious weeds.*

For a perfect mix, insist upon the best.  
ADELPHI

For information, contact:

**J & L ADIKES, INC.**  
Jamaica, N.Y. 11423  
**JONATHAN GREEN & SONS**  
Farmingdale, N.J. 07727  
**NORTHRUP KING CO.**  
Minneapolis, Minn. 55413  
**VAUGHAN-JACKLIN CORP.**  
Bound Brook, N.J. 08805  
Downers Grove, Ill. 60515  
Post Falls, Idaho 83854

Canadian Inquiries: ROTHWELL SEEDS LTD., Box 511, Lindsay Ont. K9V 4L9  
Other International Inquiries: NORTHRUP KING CO., Minneapolis, Minn. 55413



Shea Stadium, N.Y.

# Adelphi

(U.S. Plant Patent NO. 3150)

**THE GREENER KENTUCKY BLUEGRASS**



**Control 15 major turf pests with versatile SEVIN® carbaryl insecticide.**

They nip, munch, burrow and bite. As sure as grass is green, turf pests will try to make life miserable.

You can end the misery with SEVIN carbaryl insecticide.

**STOP! ALL PESTICIDES CAN BE HARMFUL TO HEALTH AND THE ENVIRONMENT IF MISUSED. READ THE LABEL CAREFULLY AND USE ONLY AS DIRECTED.**

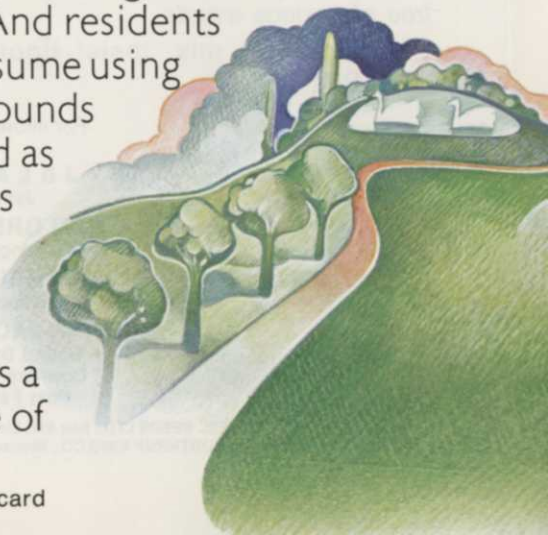
And protect the turf you manage from as many as 15 different problem pests.

Both the most common ones and the worst: ants, bluegrass billbugs, chiggers, chinch bugs, cutworms, earwigs, European chafer, fall armyworm, fleas, green June beetle, leafhoppers,

millipedes, mosquitoes, sod webworms (lawn moths) and ticks.

Broad registration only starts the list of SEVIN benefits.

It's also compatible with many other commonly used insecticides, miticides, fungicides and foliar nutrients. And residents can resume using the grounds or yard as soon as the spray dries. There's a choice of





# BACK.



four formulations—  
sprayable, wettable  
powder, flowables and  
SEVIMOL® 4, a liquid blend of SEVIN  
and molasses. Granules, dusts and baits  
are also available for certain specialized  
uses. Plus, SEVIN isn't harsh on the  
environment. It is bio-

degradable; and when compared with  
other insecticides, it ranks low in toxic-  
ity to people, animals, birds and fish.

So it's probably no surprise to hear  
that SEVIN carbaryl is one of the largest  
selling insecticides in the United  
States today.

For more information about SEVIN,  
contact your pesticide supplier or  
Union Carbide at the address below.

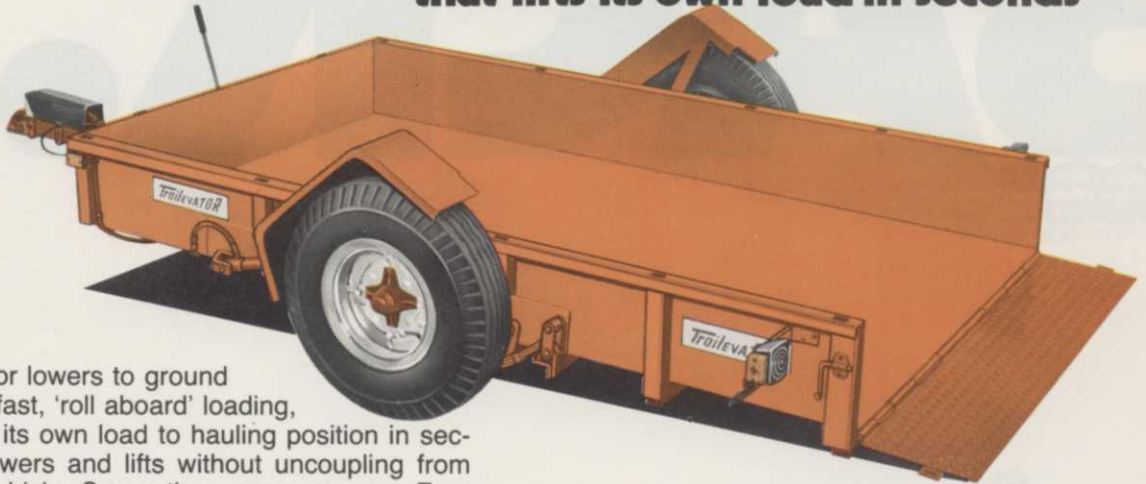
Make SEVIN carbaryl insecticide  
your answer to pest control too.

**SEVIN**   
CARBARYL INSECTICIDE  
**IS THE ANSWER.**

SEVIN and SEVIMOL are registered trademarks of Union Carbide Corporation for carbaryl insecticide.  
Union Carbide Corporation, Agricultural Products Division, 7825 Baymeadows Way, Jacksonville, FL 32216.

# HITCH UP

## TRAILEVATOR the hydraulic elevating trailer that lifts its own load in seconds



Trailevator lowers to ground level for fast, 'roll aboard' loading, then lifts its own load to hauling position in seconds. Lowers and lifts without uncoupling from towing vehicle. Saves time, saves money. Four models, two capacities: 3000 lbs. and 2000 lbs. Bed sizes up to 5'-10" x 10'.

Circle 154 on free information card



MODEL T5  
Double Axle

## TILTSTER the low bed trailer that tilts

Drop axle tilt type trailer handles loads up to 5000 lbs. Easy one-man operation. Tailgate serves as self-adjusting access ramp, provides smooth, gradual incline for fast ground level loading. Bed returns to hauling position when loaded; size: 5' 10" x 12'.



Single Axle

Handles loads up to 3000 lbs. Bed size: 5' x 8'. Heavy-duty drop center axle; 13" wheels. Tilts to ground level for easy loading.

Circle 155 on free information card



Our 'big daddy' tandem model gives you plenty of size and capacity for hauling big, bulky loads. Engineered for safe, dependable trailering, with an all-steel reinforced frame and solid, heavy-duty cargo deck. Standard equipment includes hydraulic surge brakes, safety chains, and stake pockets. Bed size: 79½" wide x 16' long.

Circle 156 on free information card

## the BIG TRAILER

2,000 lbs. capacity.



# MagLiner®

Magline Inc., Pinconning, Michigan 48650  
P.O. Box 423 Tel: (517) 879-2411

provided by an outside source. Everything here is done "in-house". We contract out for very few jobs," Zessau explained. His 15 man staff of full time employees gives Zessau the flexibility to properly manage this highly complex landscape system.

Caring for countless flower and plant beds, 12 acres of lawn, and more than 25 miles of walkways and roadsides, is an incredible task by itself. But what makes the undertaking even more difficult, is that nearly all of the horticultural environment of Century City is artificially created. It is one of the largest "container grown landscape" projects in North America. Underground parking lots catacomb most of the complex, requiring that much of the native soil be removed. "When a new high rise or other major structure goes in, that's when we get into the act. Quite often the planting areas around these new developments are nothing more than huge concrete planters," Zessau noted.



Continues on page 70

Exotic plants flourish in contained plant beds.

# KNOCK OUT Crabgrass

**ROCKLAND  
PROFESSIONAL**

**Betasan**<sup>®</sup>  
Selective Pre-emergence Herbicide

ROCKLAND BETASAN is available in three different strengths, — 12.5% granular, 3.6% granular and 4 lbs. Emulsifiable Concentrate.

(R) Betasan is a registered Trademark of Stauffer Chemical Co.

ROCKLAND has a complete line of granular insecticides, herbicides and fungicides for Professional Turf Maintenance.

ROCKLAND Fertilizers contain combinations of IBDU, NITROFORM and new SULFUR COATED UREA. Some available formulations — 25-5-15, 30-2-5 and 20-4-10.

All products are formulated with the highest quality ingredients and carriers.

ROCKLAND PROFESSIONAL lawn and garden PRODUCTS CATALOG

Ask your supplier or write **ROCKLAND CHEMICAL CO., INC.**  
PASSAIC AVE., WEST CALDWELL, N.J. 07006

Circle 167 on free information card

## HI-RANGER<sup>®</sup>

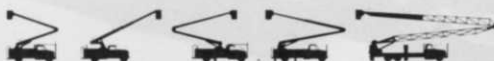


## PRODUCTIVE

Proven by owners for line clearing efficiency, and preferred by operators for precise tower control and bucket positioning. HI-RANGERS are No. 1 in utility and contractor preference for insulated aerial man-lifts. Patented HI-RANGER "3D" one-hand control, hydraulic tool line options, chip boxes, and other features may benefit your operations. Write for "4F-5F CATALOG".

HI-RANGER Aerial Towers meet the "American National Standard for Vehicle-Mounted Elevating and Rotating Work Platforms ANSI A92.2-1969," as required by the Williams-Steiger Occupational Safety and Health Act of 1970; Part 1910, Occupational Safety and Health Standards, Section 1910.67; Part 1926, Safety and Health Regulations for Construction; Sections 1926.451 (f), 1926.556, 1926.952 (b), and 1926.955 (e), as applicable.

SINCE 1950  
HI-RANGER



MOBILE AERIAL TOWERS, INC./Dept. N/2314 BOWSER AVE./FORT WAYNE, IND. 46803

Circle 105 on free information card

# WHAT'S INSIDE IT A BET

If you're hardnosed about business decisions, you want to get the in-depth facts on a product before you buy. That's why we've put together this head-to-head comparison between the insides of an E-Z-GO and a Cushman. We took comparable top-of-the line models, E-Z-GO's GT-7 and the Cushman Turf Truckster. Here's what we found.

---

**Power Source:** 18 horsepower OMC engine, tightly compartmentalized. Ground speed 0 to 22 mph.

---

**Braking:** Hydraulic internal expanding.

---

**Payload:** 1000 pounds.

---

**Suspension System:** Torsion bars, leaf springs, front and rear shocks.

---

**Dump Construction:** Single wall.

---

**Headlights:** Single.

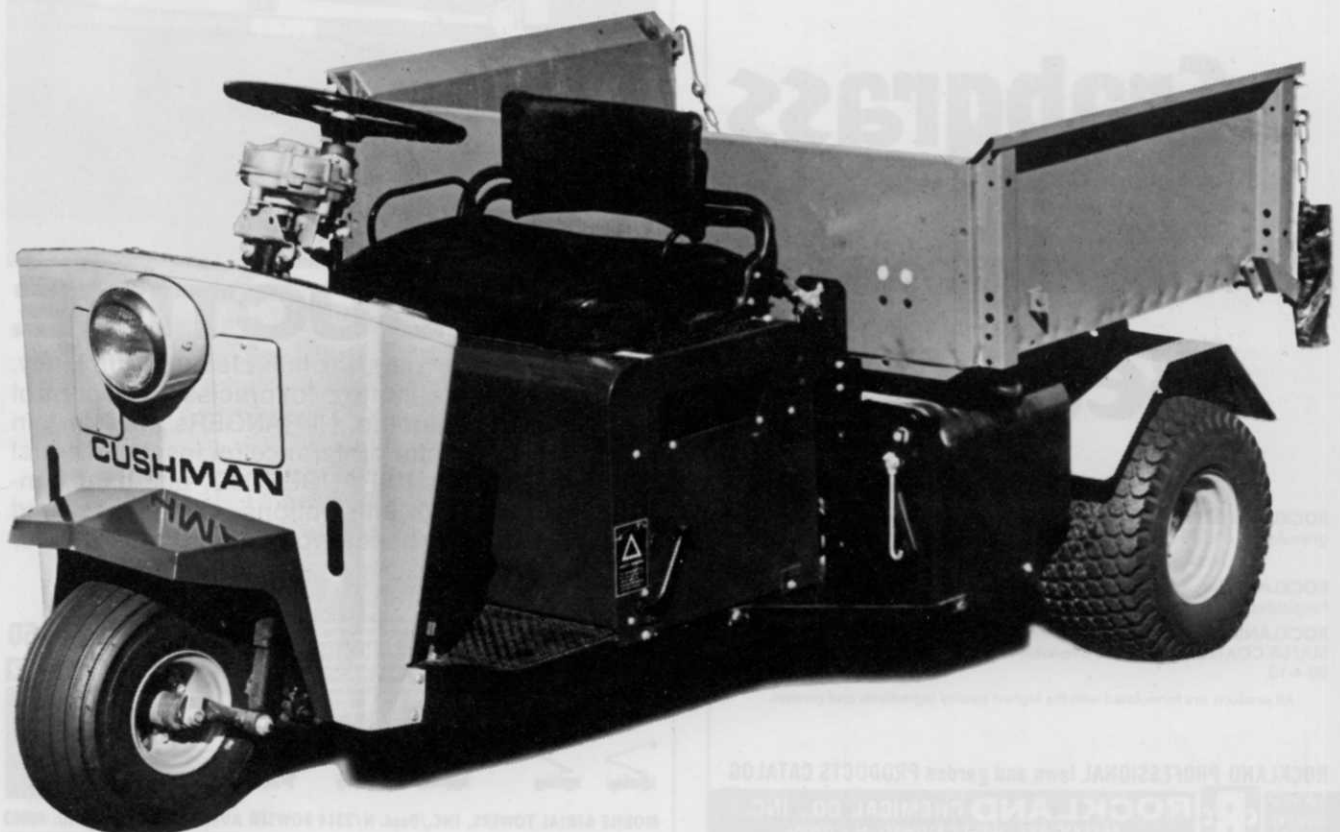
---

**Seating:** Single seat for one passenger with back rest and hip restraint.

---

**Price:** Virtually the same.

---



# AN E-Z-GO MAKES A BETTER BUY.

**Power Source:** A rugged, reliable 18 horsepower Onan engine with the power to carry a full payload up to 24 mph. Substantially larger engine compartment for easier maintenance.

**Braking:** Improved hydraulic internal expanding.

**Payload:** 1500 pounds. A massive 50% greater carrying capacity than Cushman. More cubic space for greater material volume.

**Suspension System:** Heavy duty torsion bars, leaf springs, front and rear shock absorbers, designed to support the bigger payload.

**Dump Construction:** Heavy duty diamond plate steel with rugged rear bumper for heavier loads and longer life. Easily convertible to flat bed.

**Headlights:** Dual lights for greater night vision.

**Seating:** Dual seats for two passengers with individual back rests and hip restraints, constructed for larger men, greater comfort.

**Price:** Virtually the same.

**Summary:** E-Z-GO carries a greater payload, is easier to maintain, is larger, more durably built, and safer with a wider wheel base. E-Z-GO uses top quality components from companies such as Bendix, Borg Warner, Dana, Onan, and Rockwell International.

For the complete story on the E-Z-GO GT-7, a demonstration on your course, contact your E-Z-GO distributor. For his address check your Yellow Pages or call or write Mr. William Lanier, E-Z-GO, P.O. Box 388, Augusta, Georgia 30903, at (404) 798-4311.



**E-Z-GO TEXTRON**

Polaris E-Z-Go Division of Textron Inc.



**Heals  
wounds;  
prevents  
decay**



Cabot's Tree Healing Paint is a carefully prepared bituminous paint for protecting live wood and preventing decay. Leading arborists and foresters have been using it for almost half a century. Here are the reasons why:

- ideal for trees, shrubbery, etc.; seals, heals wounds, cuts, broken limbs, pruning abrasions.
- stimulates growth of new bark
- apply with brush or spray; produces a black, tough, elastic, quick-drying coating.
- excludes moisture; stops rot; prevents evaporation of sap
- may be used in any season

**clip and mail this  
coupon today**

**Samuel Cabot Inc.**  
Dept. 358, One Union St.  
Boston, Mass. 02108

Ship \_\_\_ pints (12 per case) @ \$1.95 each  
Ship \_\_\_ quarts (12 per case) @ \$3.30 each  
Ship \_\_\_ gallons (4 per case) @ \$9.95 each

**Prices F.O.B. shipping point  
less normal trade discounts**

Circle 115 on free information card

## Century City

Extreme care is required when creating these flourishing gardens over concrete and steel. "Many are awkwardly located in and around structures. Once the landscape job is completed, we can't get in there again with heavy equipment. So if a tree dies or there is a drainage problem, we're in a world of trouble," Zessau continued.

Drainage is the most important consideration in these super containers. "Without a proper drainage system we'd lose the plants to rotting and disease," he related. "The bottom or first layer of the planter consists of rock with drainage outlets underneath. The middle layer is made up of sand and above that is the topsoil. The topsoil is a 60-40 mixture of organic matter to sand." Zessau explained that planter depths vary with the deeper ones containing as much as eight feet of topsoil and sand — enough to support large trees . . .

While drainage systems and growing mediums have been successfully developed and maintained and few plants have been lost at Century City, one factor caught Zessau and his crew off guard. That factor was wind.

"Due to the proximity of this project to the Pacific Ocean, sometimes when the wind rushes between these buildings, we get a venturi effect," Zessau observed. "This effect is similar to a vacuum and can be very harmful to anything not secured, especially young trees," Zessau added.

Century Plaza Towers are the two largest buildings in Century City. These twin structures, standing side by side, have caused gusting winds of up to sixty miles per hour. Zessau's crew planted some sturdy young *Ficus* in the Plaza between Century Plaza Towers and the ABC Entertainment Center. These trees were then bolted into the concrete with sturdy guy wires to insure their growth and safety. The guying and staking of all trees and large plants have become an important commodity in the landscape business at Century City. "And we've learned that pruning trees (a regular function) is unnecessary in some locations, since the wind does it for us," he said.

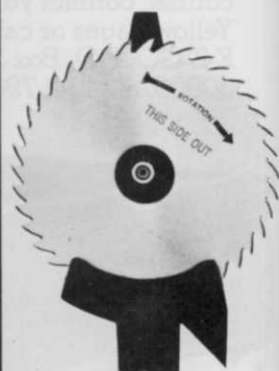
Another problem caused by the wind is irrigation. The only means considered feasible in the initial plans was the overhead sprinkler.

*Continues on page 72*

# DON'T CUT OUT QUALITY.

DO IT RIGHT,  
WITH  
STANLEY.

Quality, by our standard, is something which goes a lot further than making tools. To Stanley, it means: a full line of tree trimmers for every job; the best warranty in the business; complete parts backup; and distributors to help you anywhere in the country. It's also the efficiency, safety and dependability of hydraulic power. We don't trim on anything so that you're able to do your trimming faster. Stanley Hydraulic Tools: 3810 S.E. Naef Road, Milwaukie, Oregon 97222. Phone (503) 659-5660. Telex 360771. Write or call.

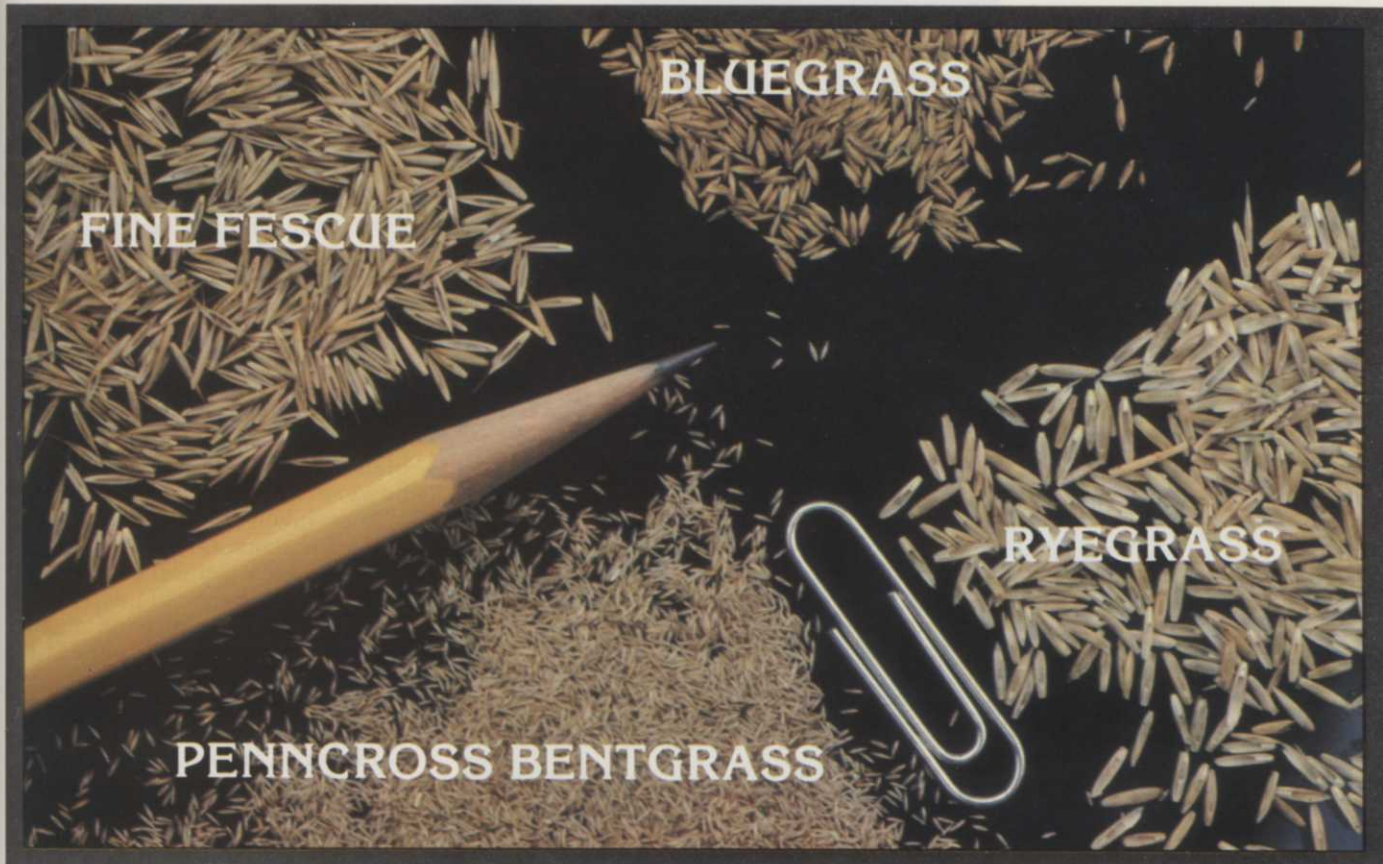


# STANLEY

®

Circle 147 on free information card

# PENNCROSS makes a POINT



## Penncross costs less, seed for seed, than Annual Ryegrass.

### Points on Penncross

1. Penncross Creeping Bentgrass required years of selecting and crossbreeding to develop. This unique grass is especially designed for the demands of golf courses.
2. Penncross is grown under a strict certification program by elite seed growers in Oregon's Willamette Valley, where the highest quality seed is produced.
3. Penncross is a true polycross

hybrid bentgrass developed for superior turf and greater disease resistance.  
**But, did you know, Penncross costs less, seed for seed, than annual ryegrass?** For example, if you purchased a pound of annual ryegrass (approximately 200,000 seeds) for 30 cents, you would have to pay \$12 for as many ryegrass seeds as you would receive in one pound of **Penncross** (approximately 8,000,000 seeds).

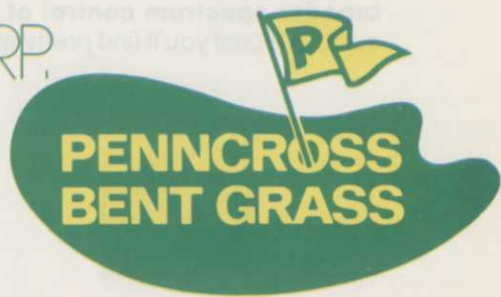
### Write for FREE INFORMATION:

- Use of USGA's film, "ABC's of Putting Green Construction"
- Free copy of our new greens maintenance booklet "Problems or Progress"
- List of Penncross Co Marketers

**PENNCROSS BENTGRASS GROWERS ASSOCIATION**  
1349 Capital St. NE  
Salem, Oregon 97303



**TEE2GREEN CORP.**  
World-wide distributor  
1212 West 8th Street  
Kansas City, MO 64101  
816/842-7845



## Be PENNY wise... PENNCROSS



John Zessau

## Century City

But with winds in some areas gusting to 60 miles per hour, this hardly seemed logical. "So," said Zessau, "what we've done in these areas is to switch from overhead to drip irrigation systems. Slow release hoses that run along the ground emit just enough water for the plants' needs," he said. "Being a ground level watering device negates the wind's effects."

Century City's overall landscape design incorporates countless varieties of flowers, bedding plants, shrubbery, lawns, and trees. Wind is obviously a factor dictating what plants go where. Zessau pointed out, however, there are many other factors involved. Shading patterns must be considered. In such an intensive architectural environment, some areas are shaded nearly all the time by one structure or another. Plants adaptable to very little sunlight must be utilized once shading patterns are established. Another factor is location. Some landscape areas are not easily accessible, so plant variety has been chosen accordingly. In these difficult-to-reach areas hardy plants are planted, which require little attention.

### Labor savers

As development continues in Century City and landscaping needs increase along with it, Zessau says he has been able to keep his work force at a minimum through the judicious use of fertilizers and chemicals. He says, "judicious", because when spraying insecticides, for example, he backs up his decision to spray with a recorded schedule of plant checking and insect observation. "Many people still think you should spray on a calendar basis. So when aphid season comes along they spray. I don't agree; I only spray when I know there's a heavy infestation." He also knows, however, that failure to treat for aphids or thrips when necessary can require expensive replacement of plants.

The two chemicals that Zessau claims are absolute necessities in his operation are growth retardants and herbicides. "They're the real labor savers." With ivy, for example, he can get away with much less pruning than is normally required through the use of an effective growth



**Banvel<sup>®</sup>**  
**tough on weeds,**  
**easy on turf.**

**Beautiful results!** How often have you tried a herbicide only to end up with poor control or damaged turf? No longer. Banvel<sup>®</sup> 4S, and Banvel<sup>®</sup> +2,4-D give you economical control of more than two dozen difficult weeds. Weeds that other herbicides often miss. The translocating action of Banvel<sup>®</sup> attacks the entire weed, roots and all, to get at deep root and regrowth problems. True season-long herbicides, they can be used in warm or cool, wet or dry weather, and store through the winter without loss of potency. They mix readily in hard or soft water, and may be applied with conventional spray equipment. **Banvel<sup>®</sup> 4S for tough weeds, Banvel<sup>®</sup> +2,4-D for pre-mixed chemicals and broader spectrum control of broadleaves.** You get beautiful results, at a cost you'll find pretty attractive, too!



Before using any pesticides, read the label.

**Velsicol**

VELSICOL CHEMICAL CORPORATION  
 "The turf chemical specialists"  
 341 East Ohio Street, Chicago, IL 60611  
 (312) 670-4592

Circle 158 on free information card

Continues on page 75



**That natural, woody look.  
And lightning protection  
your golfers deserve.**



## The new Standard Shelterport.

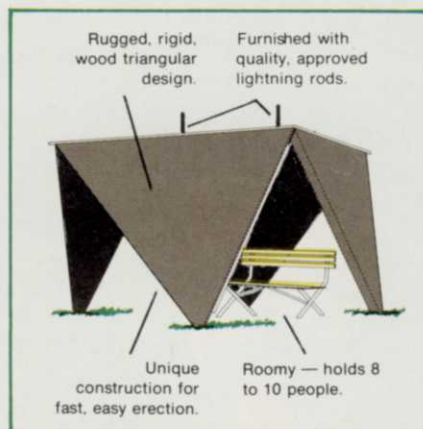
You've long wanted a facility that gives a good measure of shelter, including lightning protection, to your golfers.

One that combines modern design with a woody look. So it blends into your course.

And one that doesn't cost a fortune.

Shelterport's your answer — and more!

Its 8' x 8' floor area and 6'11" height holds 2 Standard benches, 8 to 10 people.



Features rugged, rigid, triangular-design 2 x 4 construction with wood side panels. Unique metal joint — connectors make it extra easy and fast to erect.

Why neglect your golfers any longer? Contact us for full details, brochure on Shelterport.

Or see your nearby Standard distributor.

Standard Golf Co., Cedar Falls, Iowa 50613  
319/266-2638.

**STANDARD**  
**GOLF** *Pro-Line*

# How Roundup® helped Jim Siegfried renovate this fairway in days, without closing it for one minute.



Take a good look at this good-looking fairway.

Last fall, Jim Siegfried found a way to clean it up, without tearing it up—at the height of his club's busy season. With Roundup® herbicide by Monsanto.

Jim is the Greens Superintendent at Losantiville Country Club, Cincinnati, where bermudagrass had become a serious problem on the 18th fairway. To control it, Jim applied Roundup once—while the weeds were still actively growing—right at the start of the Labor Day weekend.

"That's really 'prime time' here," Jim told us. "But after we applied Roundup, we kept the fairway in play the whole weekend, and after. The members played right over it, with no problem."

Since Roundup has no residual soil activity, and won't wash or leach out of treated areas to injure desirable plants, Jim simply took normal precautions against spray drift—and didn't worry about damaging desirable vegetation along the fairway.

Even better, he was able to reseed right into the dying bermudagrass only 7 days after applying Roundup—without loss of playing time or inconvenience to the membership.

Reinfestation won't be a big problem for Jim, either. He knows that Roundup destroyed the rhizomes of the treated weeds, helping prevent their regrowth.

Jim thinks he'll use Roundup again this year—and apparently some club members hope so, too. "As soon as they saw how good this fairway looks, some of the members started asking when I'm going to do the same for #10, where we have some more bermuda. I'll probably tackle that with Roundup this fall."

*If controlling many tough emerged weeds and grasses is a problem for you, see your local Monsanto representative or chemical dealer soon for your supply of Roundup.*

*Roundup. It worked for Jim Siegfried. It can work for you.*

Circle 175 on free information card



**There's never been a herbicide like this before.**

ALWAYS READ AND FOLLOW THE LABEL DIRECTIONS FOR ROUNDUP.  
Roundup® is a registered trademark of the Monsanto Company. © Monsanto Company, 1979.  
For more information, contact Monsanto Agricultural Products Company,  
800 North Lindbergh Blvd., C3NF St. Louis, Mo. 63166 (314) 694-1000. RF-01D

## Century City

retardant. "Instead of having to prune mountains of ivy every month we can reduce the number of prunings by a third," he said.

Because such a good horticultural environment is created for plants in Century City, weeds also flourish. Besides heavily infested plant beds, Zessau is constantly plagued with weed growth in expansion joints, where the asphalt on the streets meets the curb, at the divisions and cracks in sidewalks, and so on. "We use Round-up herbicide on a regular basis to kill these existing weeds," he related. "In our annual beds, however, we like to use a pre-emergence herbicide to hold weed populations down over long periods. We've been most impressed with Devrinol (Stauffer Chem. Co.) herbicide because it keeps weeds back for so long in our beds. It keeps them clean for the whole season. We've also had a lot of trouble with weeds growing in the ivy," he continued. "When we have to renovate (cut back) the ivy, sunlight gets in and promotes weed growth. What we've done is spray devrinol down through the ivy after renovation. We've also been able to save water here, because we don't have that heavy thatch in the ivy to absorb all that moisture."

In Zessau's comprehensive fertilizer program he begins by categorizing the various landscape beds in the development. He explained, "We categorize the different planters by location and accessibility. In the hard-to-get-to areas we apply a slow-release type of fertilizer, while the easily

*Continues on page 87*



Turf area on edge of complex.



## HOFFCO **Whizz Witch**

A tough 85cc engine stands behind trimming head and 2 cutting blades.

- Tri-line, heavy duty monofilament trimmer head.
- 11" Tri-Kut weed blade cuts heavy weeds, briars and brambles.
- 10" 44 tooth brush blade (optional) cuts up to 3" diameter saplings at ground level.

### HOFFCO-P10-A BRUSHCUTTER/POWER SCYTHE

Offers the same equipment package, but the trimmer head is optional.



11 inch  
Tri-Kut  
blade



tri-line  
monofilament  
trimmer head



10 inch  
44 tooth  
brush blade

The 2 cycle, 22.5cc engine, can be operated in any position.  
Total wgt. 13½ lbs.

1. Monofilament trimmer head
2. 8" Tri-Kut blade
3. (optional) 8"-44 tooth brush blade

## HOFFCO **genie** T.M.

## HOFFCO

## Brushette T.M.

Special merchandising displays available.

### CHAIN SAW ATTACHMENT

Also attaches easily to most light-weight chain saws. • 8" Tri-Kut weed blade • 8" 44 tooth brush blade • optional monofilament trimmer • Use for overhead tree and brush trimming.

### HOFFCO'S "HUMAN ENGINEERING"

The carrying harness and handlebars with anti-vibration grips can be adjusted for the comfort, balance and separates operator from cutting and trimming heads.

## Whizz Winch T.M.

1,000 lbs. of pulling power  
Does the work of 10-20 people  
14' of working cable



### HOFFCO PH 977-A

A true ONE MAN post hole drill  
Full wrap-around handles  
\* deadman throttle control and kill switch on handle \* Comet auto \* centrifugal clutch \* 18.1 power ratio 2 to 8" earth bits \* 8" ice bit available. Drill to 30" (4' with extension accessory).

### HOFFCO PH 1100-A 2-man

4-cycle engine. Special throttle control and auto. centrifugal clutch.

Write for free brochures & name of Distributors in your area . . .


DEPT. WTT-379 • 358 N.W. "F" STREET • RICHMOND, IN 47374

Circle 145 on free information card

**Managers, Instructors, Librarians**

# Finally, An Aid For Teaching Turfgrass

Purdue University's turf experts, Dr. William H. Daniel and Dr. Ray P. Freeborg, have coauthored a comprehensive, organized approach to learning turfgrass science and care. Based upon years of teaching experience at Purdue, Drs. Daniel and Freeborg cover management of all major turf uses today. The book, a valuable reference, includes specifications for planting, fertilizing, regulating growth, mowing, and other maintenance practices. Whether for quick reference or as a basis for all turf knowledge, the book will be among books by Couch and Beard on the reference shelf. The book is 420 pages and contains 16 pages of color illustrations.



**TURF  
managers'  
HANDBOOK**

Comprehensive  
Practical  
Instruction  
for All Turf  
Professionals

**W. H. Daniel  
R. P. Freeborg**

Harvest Publishing Company, 1979

## Ordering Information

Please send \_\_\_\_\_ copies of the hardback (\$18.95 each\*).  
\_\_\_\_\_ copies of the softback (\$14.95 each\*)

\*A shipping charge of \$1.25 per book must be added.  
A check or money order for \_\_\_\_\_ is enclosed. I would like to use  
my Master Charge Acct. No. \_\_\_\_\_ or My Visa  
Acct. No. \_\_\_\_\_. I understand that delivery  
may take six to eight weeks.

Signature \_\_\_\_\_

Name (Print) \_\_\_\_\_

Address \_\_\_\_\_

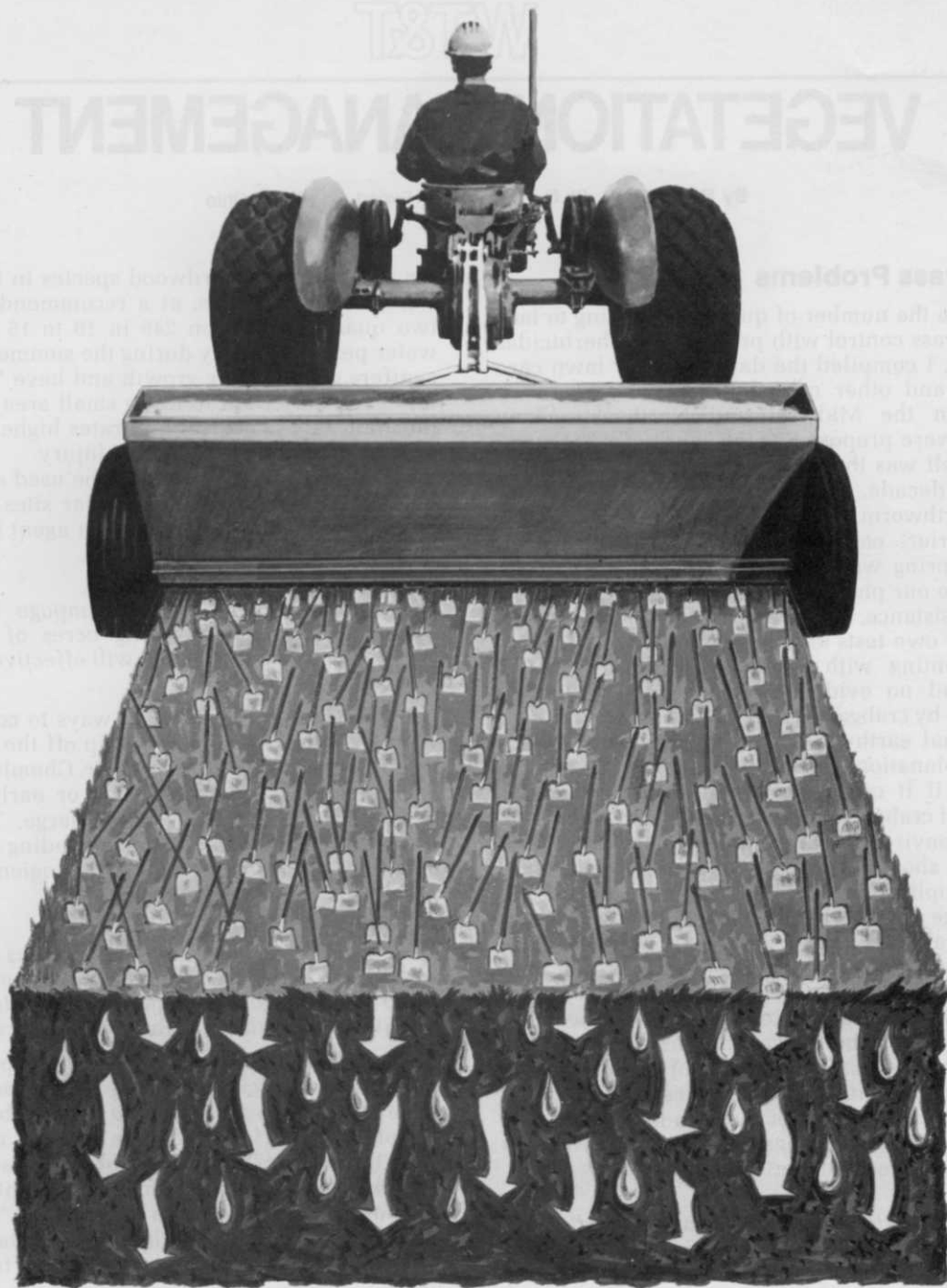
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Business Publication Division  
Published by  
**The Harvest Publishing Co.**  
9800 Detroit Ave.  
Cleveland, Ohio 44102



**PUBLISHING  
COMPANY**

ATTN: Book Dept.



## **Easy way to loosen heavy clay soil! Works like millions of tiny hoes.™**

Sof'n-Soil™ Gypsum works its way down to loosen heavy clay soil so it can breathe. Lets air and water penetrate, boosts efficiency of costly fertilizers. Sof'n-Soil, a natural mineral, stimulates vigorous root systems—promotes growth of grass, trees, shrubs, and flowers. Ecologically safe, Sof'n-Soil is *not lime*. It's neutral, non-



caustic, non-burning—harmless to plants, pets, and people. And here's the bonus: Sof'n-Soil supplies essential calcium and sulfate sulfur in readily available form, stimulates decomposition of organic materials, too. Write to us at 101 S. Wacker Dr., Chicago, Ill. 60606. Dept. WTT-39.

CHEMICALS DIVISION

**UNITED STATES GYPSUM**

Primary Supplier of Secondary Plant Nutrients

# VEGETATION MANAGEMENT

By Roger Funk, Ph.D., Davey Tree Expert Co., Kent, Ohio

## Crabgrass Problems

Due to the number of questions relating to lack of crabgrass control with pre-emergent herbicides last year, I compiled the data from our lawn care division and other contributing lawn care companies in the Midwest and Northeast. Many reasons were proposed as the cause of what many people felt was the worst infestation of crabgrass within a decade. Among the suggestions were unusual earthworm activity that disrupted the herbicide barrier, early crabgrass germination even though spring was delayed (an 18-day delay according to our phenological data), developing herbicide resistance, and late germinating crabgrass.

In our own tests and those of other researchers experimenting with pre-emergent herbicides, I could find no evidence of increased herbicide tolerance by crabgrass seedlings.

Unusual earthworm activity may be a reasonable explanation in localized areas, but it is doubtful if it could explain the widespread incidence of crabgrass reported to me last year.

If the environment were the primary causal factor, there should be some consistency relating the time of application with the degree of control. The percentage of lawns reportedly with unsatisfactory crabgrass control was more or less constant throughout an application period from March 24 to May 10.

In short, I could not find sufficient evidence to support any of the suggestions as the probable cause of an increased incidence of crabgrass. It is quite possible that other companies will find — as we did — that when all of the data is accumulated and analyzed, the crabgrass infestation was not nearly as severe as earlier suspected.

**Q:** *To what extent has used crankcase oil been utilized to sterilize soil under gravel beds (in lieu of utilizing plastic — fiberglass mats — herbicides) — are there any known problems?*

**A:** If you are referring to the use of crankcase oil for weed control in landscape plantings, we have not attempted this and could find no references. I would suspect that if the oil is concentrated enough to control weeds, it would also cause injury to ornamentals, particularly those that are shallow rooted.

If you are referring to oil in gravel beds without ornamentals, it should be successful. Crankcase oil has been used in gravel driveways for total plant control.

**Q:** *I have a tree plantation of 3-8' pine and spruce trees. Brush (poplar, willow, etc.) has grown to the same height among these trees. Can you recommend a selective herbicide that will kill the brush but not harm the pine and spruce trees?*

**A:** Esteron 245, a formulation of 2,4,5-T, is labeled

for the control of hardwood species in forest conifers, including pines, at a recommended rate of two quarts of Esteron 245 in 10 to 15 gallons of water per acre. Apply during the summer after the conifers cease spring growth and have "hardened off." You may want to test a small area as the application rate is critical and rates higher than two quarts/acre may cause conifer injury.

2,4,5-T formulations cannot be used around the home, recreation areas or similar sites. Read the label and consult your extension agent for recommendations to fit local conditions.

**Q:** *Bagworms went on the rampage in certain regions last year, devouring acres of greenery. What are the chemicals that will effectively control this pest?*

**A:** One of the most effective ways to control bagworms on small shrubs is to clip off the bags from infested plants during the winter. Chemical control is most effective in the spring or early summer before the larvae become too large. There are many effective chemicals, including carbaryl, diazinon, acephate or *Bacillus thuringiensis*, which provides a biological control.

**Q:** *I recently heard of a number of trees dying on a golf course built over an old land fill and understand that it is gas that is killing them. Is research relative to this subject being conducted currently?*

**A:** Dr. Franklin B. Flower, extension specialist in Environmental Science at Rutgers University, New Jersey, has been investigating species best suited for planting on land fills. He and his colleagues have travelled extensively in order to assist others in making on-site evaluation of the potential for gas vegetation growth problem on land fills. They have research plots on land fills and the data obtained will eventually show the best planting techniques to use.

**Q:** *After reading the article (October 1978) on fertilizing trees, I wonder what liquid N-P-K and/or micronutrient fertilizer solutions are available. I use a high pressure piston 10-gpm, 110-gallon tank sprayer for spraying trees and lawns. I also use an injector probe made from 1/2-inch steel electrical pipe to inject fertilizer into the soil. What fertilizers are available to avoid minimal wear on my sprayer?*

**A:** Liquid, soluble fertilizers cause less abrasive injury than liquid suspension fertilizers to pumps and spray equipment, which is your primary concern. However, suspension fertilizers are less corrosive to metals, have a lower "burn" potential on plant roots and have a longer residual in the soil.

*Continues on page 83*

# CIL Sulphur Coated Urea

## The Number One Controlled Release Nitrogen Fertilizer



CIL Sulphur Coated Urea is being tested against other controlled release nitrogen fertilizers at 14 different universities in the U.S. and Canada. Photo above shows one of the test sites with CIL Sulphur Coated Urea treated grass in foreground.

**Efficient**  
**Effective**  
**Economical**



**Efficient**

- Release of nitrogen is controlled by moisture. Temperature and bacterial activity are not important factors. Excess moisture however, **does not** markedly speed up the release of the nitrogen.
- Soil ph does not alter pattern of release.

**Effective**

- Tested on grass plots under scientifically controlled conditions, CIL Sulphur Coated Urea outperformed all conventional slow release nitrogen fertilizers tested, in both the appearance and growth of grass obtained.
- CIL Sulphur Coated Urea releases nutrients as soon as it is applied and continues to do so evenly over 4 to 5 months. Result is more complete utilization of nitrogen applied, and no build up of nitrates in the soil.

**Economical**

- Low cost per unit of controlled release nitrogen.
- Available in bulk or in 55 lb plastic bags.

Background photo:  
CIL Sulphur Coated Urea prills  
actual size.

Please send me more information about **CIL Sulphur Coated Urea**.

Please advise who can supply me with blended products made with **CIL Sulphur Coated Urea**.

Name..... Company.....

Street.....

City.....

State.....

Zip.....

Mail to:  
Peter Buckley  
Professional Turf Products  
Canadian Industries Limited  
P.O. Box 5201, London, Ontario, Canada  
N6A 4L6 Telephone: (519) 672-9220

*A dependable source of supply of quality products, in commercial quantities, from Canada's largest chemical company*



**Canadian Industries Limited**

**For the turf you care for: season-long protection against crabgrass, Poa annua and other annual grasses and weeds with America's leading preemergence turf herbicide.**

# Dacthal





Dacthal is number one in its field. Not only because it is so effective, but because it controls more than 20 unwanted weeds and grasses. Applied properly, it lays down a barrier that stops early and late germinating annual weeds without affecting healthy, growing turf grasses. Tough weeds like crabgrass and Poa annua can't stand up to Dacthal.

**The help you need for total turf care.**

**Dacamine®** provides post-emergence control of over 70 broadleaf weeds including dandelion, annual chickweed, knotweed and Canada thistle. It works right down to the roots. So tough perennials don't return.

**Daconate®** is the post-emergence herbicide that knocks out nutsedge, chickweed, wood sorrel, sandbur and other grassy weeds. It's a ready-to-use liquid herbicide with a built-in surfactant for uniform wetting.

**Daconil 2787®** is the broad-spectrum fungicide that stops nine fungus diseases on turf. Use it from spring to fall to prevent dollar spot, leaf spot, red thread, stem rust of blue grass, large brown patch. It's effective even in hot weather. Provides disease control on a number of ornamentals.

Count on the big four from Diamond Shamrock to make your job easier.

Circle 138 on free information card



**Diamond Shamrock**  
The resourceful company.

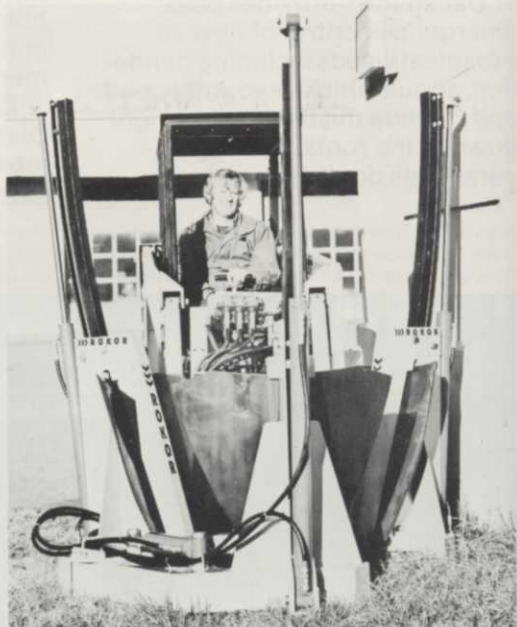
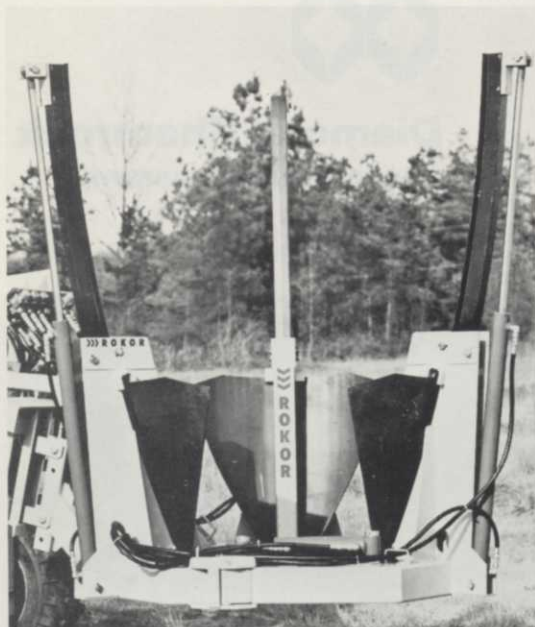
See your turf chemicals supplier, or contact the Diamond Shamrock Agricultural Chemicals Division sales office nearest you:  
Three Commerce Park Square, 23200 Chagrin Blvd., Beachwood, OH 44112 • 1760 The Exchange, Suite 100, Atlanta, GA 30339 • 5333 Westheimer, Suite 850, Houston, TX 77002 • Commerce Plaza Bldg., 2015 Spring Rd., Oakbrook, IL 60521 • 617 Veterans Blvd., Redwood City, CA 94063.



# »»» ROKOR

## TREE DIGGERS

PRECISION-BUILT FOR DEMANDING PROFESSIONALS



MODEL TD-32. Weight—1,070 lbs. Digs a 420 lb. ball; a true 32" wide and 28" deep; trees up to 3" diameter. Complete with hydraulics and adapter for skid loader or tractor mounting. As shown.

MODEL TD-40. Weight—1,600 lbs. Digs a 950 lb. ball. Ball is a true 40" wide; 38" deep. Handles trees up to 4" in diameter. Furnished complete with hydraulics, adapter and lift attachment, if required.

MODEL TD-54. Weight will vary depending on choice of type of truck or heavy loader mounting. Digs a 2,100 lb. ball that is a true 54" wide and 46" deep. Designed to handle trees up to 6" in diameter.

- Rokor Diggers are light in weight to extend your mounting options but are designed stronger and tougher by Rokor Engineers to withstand the most rugged

operating conditions.

- Curved stems require less operating space and can work the more heavily planted areas. The TD-32, for example is only 71½" wide when open and can plant or dig within 36" of a wall or fence.
- Spoon-shaped blades produce a true nurseryman's ball and opposite-side blade sharpening means tighter cones and clean root shear. Computer programmed to insure uniformity. Choice of sand or clay blades with quick blade change in the field.

**DISTRIBUTED EXCLUSIVELY BY**  
**Spartan Tree Equipment Company**  
16084 South Chandler Road  
East Lansing, Michigan 48823  
517/351-1370

**MANUFACTURED BY ROKOR, INC. • P.O. BOX 1409 • WILSON, NORTH CAROLINA 27893**

There are a number of soluble N-P-K formulations on the market including Prolawn, Sta-Green and Rapid-Gro. Most of the soluble fertilizers are formulated from the same nutrient sources and, therefore, give similar results when applied at the same rate. You should price the fertilizers and compare the cost per nutrient pound.

Micronutrients are available in the chelated form as Sequestrene and as soluble salts such as ferric nitrate and magnesium sulfate.

**Q:** What is the composition of Wilt-Pruf? Can this product serve as winter guard?

**A:** Wilt-Pruf NCF is a low molecular weight, Lewis acid catalyzed polymer of beta-pinene. It is chemically di-l-p-Methene.

Wilt-Pruf reduces tissue desiccation and is labeled for winter protection.

**Q:** I need the name and vendor of a product that will help to eliminate Christmas tree poaching. I understand that such a spray is available that will not harm trees but will give off an offensive odor when the tree is placed indoors.

**A:** You are probably referring to the deer repellent which gives off an offensive odor at room temperature. Such a product was used by the Somerset County Parks Commission in New Jersey this past winter. Contact Jack Moody, secretary-director of the commission, for evaluation of the product. **WTT**

Preserve Your Copies of  
**WEEDS, TREES & TURF** in

## Permanent Binders

only \$4.75



Custom-made binder easily holds entire year's copies of WTT magazine. Green binder with gold embossed logo protects your magazines and gives your library a neat appearance. Magazines can be inserted as they are received. Annual index in December issue makes it easy to find information you need quickly . . . Send check or money order to:

**WEEDS TREES & TURF**  
9800 Detroit Ave.  
Cleveland, Ohio 44102

## Herd BROADCASTERS

for the Commercial Operator  
and Homeowner

Spreads Fertilizer  
Seeds, Salt, Sand  
and Granular  
Chemicals



**GT-77**  
77 LB. CAP.  
FOR GARDEN  
TRACTORS

**750 9.6 BU.,**  
750 LB. CAP.  
FOR THE LARGER  
BROADCASTING JOBS

Write for new colorful 8-page brochure on full line of 8 sizes and many variations to suit particular needs.

**HERD SEEDER CO., INC.,** DEPT. 232  
P. O. BOX 448, LOGANSPORT, IN 46947

Circle 177 on free information card

## Davey announces a two-week seminar for urban forestry foremen.

The Davey Horticultural Institute in Kent, Ohio, will conduct a series of special two-week courses in tree-care maintenance operations beginning May, 1979. Any federal, state, municipal or institutional employee can enroll. Since 1904, Davey has been conducting formal training programs on tree-care maintenance.

You will be able to expand your knowledge in all phases of tree maintenance through lectures, demonstrations and concentrated work in the field. You're assured of ample individual attention because the student/instructor ratio will be 8 to 1, or less.

**Subjects covered will include:** • Pruning • Climbing • Transplanting • Cabling • Tree insects • Fertilizing • Bark tracing • Girdling roots • Spray equipment • And much, much more

Your \$575 tuition covers all reference books, study pamphlets, supplies, equipment rental fees, materials for field operations and insurance.

Low-cost accommodations are available at Kent State University's Korb Guest House. The Kent area has a number of inexpensive restaurants. Regular limousine service links Cleveland-Hopkins Airport with the Institute.

Classes are limited to just 24 students on a first-come, first-served basis, so we urge you to act today. For complete information, please contact:

Richard E. Abbott  
Vice President, Davey Environmental Services  
117 S. Water Street, Kent, Ohio 44240

**Tel: (216) 673-9511**

Circle 159 on free information card

MARCH 1979/WEEDS TREES & TURF

## PROSCAPE

By Michael Hurdzan, Ph.D., golf course designer and consultant

**NOTE:** In the January 1979 issue of WTT, I advised you on a late fall fertilization to be applied in late November and early December. Although I have seen good results with fertilizer applications during this period, I believe that you will have better results with a mid-October application instead. This change in thinking is basically a product of many discussions with turf managers and researchers this fall and winter.

**Q.** I have heard and read many viewpoints on thatch and mat in turf and in almost every instance the definition of the two has been reversed. Please give an example and illustration of each (thatch and mat). Also, has any information on the use of Posan to retard seeding of *Poa annua* on greens been compiled, or is Posan strictly for fairways? Oxnard, CA

**A.** The difference between mat and thatch is only in degree. The term mat is meant to connote about 1/4" or less of undecomposed stems, leaves, stolons or rhizomes, that accumulate between the soil surface or rootzone and the living plant. In most instances mat is a desired condition because it provides resiliency to the turf and thus lessens mechanical damage to the plants, resists compaction of underlying soils, and reduces rapid evaporative moisture loss from the soil. In short it is a thin manageable, thatch layer. On the other hand, thatch is the excess accumulation of the same dead plant parts which results in all the commonly associated, and too well known problems.

The use of Posan should be confined strictly to fairways and a Bensulide based product used on greens. Check the September 1978 Proscap column for elaboration.

**Q.** Is there a school in the U.S. where you can take a landscape architect course by corresponding? B.H., Accomac, Va.

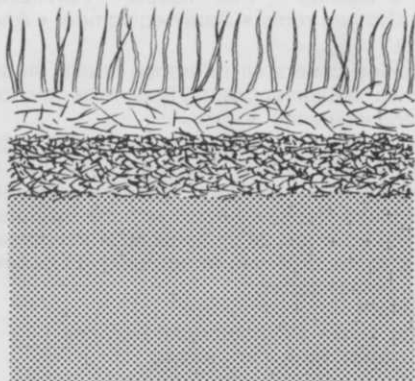
**A.** Not that I know of and if there was such a course I would advise you not to waste much money or time with it. The reason for such a strong

negative reaction is that to learn landscape architecture skills by correspondence is analogous to learning medicine by mail. To do landscape architecture (not to be confused with landscape design) requires using: Detailed problem and situation analysis; applying a suitable design process; formulating and presenting the design in standard architecture language; selling the design intention from a basis of history, economics and limitations using many graphic skills; and then being able to technically advise and inspect the work during construction phases. The really proficient landscape architect also has the ability to advise on long term maintenance of the design features to insure it remains as he planned it. To acquire these basic skills requires 4-5 years of total immersion in a classroom/studio situation where you learn most from your fellow classmates, much from the professors and critics, and some things from your own efforts. This program is very intense and requires extreme discipline of mind and body to endure the rigors of a program that sets high standards in such diverse subjects as:

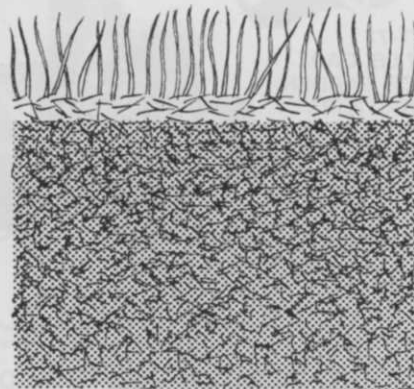
- 1) History
- 2) Basic design
- 3) Graphic and design language
- 4) Architecture appreciation
- 5) Problem analysis and construction methods
- 6) Communicative skills
- 7) Plants, plant materials, and construction materials
- 8) Advanced math or computer science.

To dramatize the dedication that such a program requires, it is not unusual for many large universities to start with 200 L.A. students as sophomores and only graduate 40 or 50 of that group. The benefit to the general public is that this harsh selection process insures only qualified practitioners.

In addition, most states require that a landscape architect be registered within that state and often this requires extensive testing. To pass these rigorous tests nearly mandates a formal college program. Check Proscap in the January issue of WTT for more information on available schools.



**Thatch, as illustrated** on the left, is an excessive accumulation. Mat, illustrated on the right, is an acceptable amount of thatch that actually enhances the micro-environment. (Photo courtesy of *Turf Manager's Handbook* by W. H. Daniel and R. P. Freeborg.)





## ARBOTECT® 20-S

# The strongest Dutch elm disease protection you can give a tree.

ARBOTECT 20-S fungicide helps make it possible to save many elm trees that otherwise would be lost.

Injected into the trunk of the tree, ARBOTECT builds a barrier against Dutch elm disease inside the tree itself. It helps prevent the disease in healthy elms, and can often save infected trees if they are treated early enough.

Used along with sanitation, insect control, and root graft elimination, ARBOTECT can significantly improve the effectiveness of a Dutch elm disease control program.

ARBOTECT differs from other elm fungicides in several important ways:

- It is registered at rates high enough to be effective.
- It is concentrated, requiring much less water for injection, so trees can be treated much faster.
- Thiabendazole, the unique active ingredient in ARBOTECT, is highly effective against

*Ceratocystis ulmi*, the fungus that causes Dutch elm disease.

- Even though it is more effective and convenient, ARBOTECT costs about the same to use as other elm fungicides.

This year, put ARBOTECT to work in your disease control program. It's the strongest protection you can give an elm against Dutch elm disease.



## Arbotect

### Strong protection for elms.



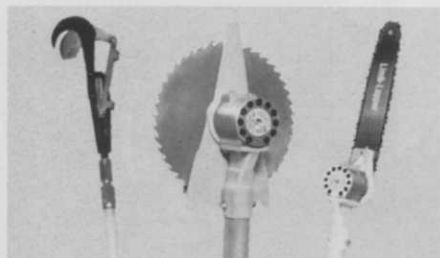
Agricultural Products  
Merck & Co., Inc. P.O. Box 2000  
Rahway, New Jersey 07065  
ARBOTECT (thiabendazole) is  
a registered trademark  
of Merck & Co., Inc.

Circle 106 on  
free information card

## CUT MAINTENANCE TIME and COSTS

### Limb Lopper Hydraulic Tools

Combine Limb Lopper versatile hand tools with your existing system for faster, more efficient maintenance operations. Use them with digger-derrick, bucket truck, other mobile equipment or portable power pack.



**CUT AND PRUNE**



**PUMP AND SAW**



**DRILL AND TAMP**



*Light, fast and tough!*

**Limb Lopper**

See your local dealer or write:

**Robinson Industries**  
11845 Burke Street  
Santa Fe Springs, CA 90670  
(213) 945-1077

Circle 146 on free information card

## NEWS *Continued from page 14*

Nurserymen's Association and the Columbus Landscape Association. Dr. Chadwick has organized a steering committee representatives from the Kiwanis Club, The Ohio State University Horticulture Department, Secrest and Dawes Arboretums, and the Metropolitan Park District of Columbus, Ohio.

A master plan is being proposed that will incorporate the best in new varieties of ornamental plants within the natural beauty of Inniswood Gardens. Some plantings are scheduled during 1979, with the greatest emphasis during the 1980 and 1981 planting seasons.

### NURSERY

#### **HRI approves funds for fifteen projects**

The Horticultural Research Institute, Washington, D.C., recently approved funding for 15 Richard P. White \$500 Research Grants for 1979.

Any organization conducting nursery research is eligible to apply including state and federal research laboratories, land grant universities, forest research stations, and arboreta.

Recipients are selected on the basis of their responses on a one-page questionnaire. The only restrictions are grant recipients must agree to use the money to purchase supplies or equipment to continue or complete a project and they must report the progress and/or results of their research to HRI for distribution to the nursery industry.

Grant applications are available from HRI, 230 Southern Building, Washington, D.C. 20005, and must be

returned by May 1.

In related news, an expanded edition of the HRI publication *New Horizons* is now available. The booklet has been expanded in 1979 to include reports from HRI contract researchers and Richard P. White grant recipients.

Cost of the 40-page publication is \$2.50 per copy for educators and \$4 per copy for others from HRI, 230 Southern Building, Washington, D.C. 20005.

### RESEARCH

#### **Degassed water shows growth advantage**

Two Russian scientists have discovered that "degassed" water promotes increased growth in plants. Igor and Vadim Zelepukhin, of the Institute of Fruit-Growing and Vine-Growing of Kazakhstan, Kazakh, U.S.S.R., accidentally discovered that water which is boiled and cooled rapidly is several times more biologically active than meltwater.

Test showed that seeds soaked in the "degassed" water produced increased yields and some crops watered with it produced 10 to 12 percent higher yields.

The researchers said higher yields result because "degassing restructures" the water molecules so they are in the proper pattern to pass more readily through cell walls and be utilized immediately in vital cell functions.

The "degassing" process involves boiling the water, thereby removing dissolved gasses, and quickly cooling it, under airless conditions, so no gasses can re-dissolve into the water.

55 Years and over 5 million trees

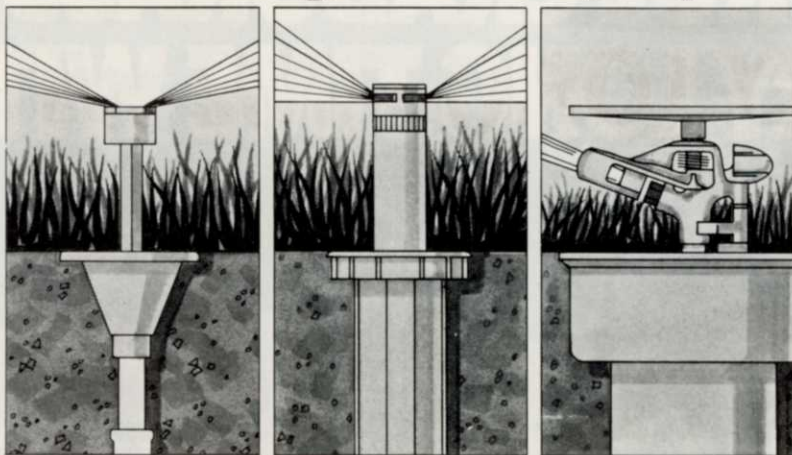


# Cottage Gardens inc.

SOUTH WAVERLY & BISHOP ROADS  
LANSING, MI 48910  
PHONE (517) 882-5728

Circle 172 on free information card

# The taller the grass ...the higher we pop!



From residential to light commercial turf installations, Champion has a pop-up to do the job! When you compare the cost, precision construction and performance, you'll buy Champion. The 18HP (2" pop-up), the P180 (2½" pop-up) and the 6178 Impulse pop-up are just three of over one-hundred fifty sprinklers,

valves, controllers and accessories featured in the new Champion, full-color catalog. Ask for your free copy.



**CHAMPION**  
**SPRINKLER EQUIPMENT**

1460 N. Naud St.  
Los Angeles, CA 90012  
(213) 221-2108/(213) 223-1545

Circle 160 on free information card

## ALMOST MAINTENANCE FREE **Tallhedge**™

Here is the ideal solution for hedges and screens. TALLHEDGE™ grows fast and thick with minimum care. It matures into upright four-foot wide columns, twelve feet high with lustrous dark green leaves. If desired it can be shaped into a formal hedge. During the summer months attractive berries add color.

Ask for the true "cutting-grown" TALLHEDGE™. Excellent for all types of landscape screening, property line separations and backgrounds. There is only one TALLHEDGE™... from the Originators, American Garden Cole.

**AMERICAN GARDEN**  
**cole**

30627 Orr Road/Circleville, Ohio 43113  
Phone 614-477-1671

Where great new plant ideas take root.

Circle 126 on free information card

## Century City

accessible places are treated bi-monthly with a quick release fertilizer. The slow release is applied once a year and then we have intermediate fertilizers for areas scheduled for treatment three or four times a year." Zessau's fertilizer decisions are not made by guesswork, though. His soil amendments are scientifically formulated from soil samples and lab analysis done by O. A. Matkin, Soil and Plant Lab, Los Angeles. Zessau credits Matkin with a major role in the overall up-keep of plant nutrition at Century City.

Decisions concerning fertilizer breakdown and concentration are only one aspect of Zessau's soil amendment program. Fertilizer applications are common at Century City. Fertilizers are applied when needed and Zessau has learned that when spraying any chemical in an urban area people are inevitably going to be concerned. "I don't care if you're spraying water — somebody is going to get uptight about it," he said. Zessau has found that a little psychology goes a long way; instead of applying liquid fertilizers, he's switched to granular mixes. "Oddly enough, people don't look twice if you're applying a granular," he observed. "The only time we ever apply a liquid fertilizer is in extremely hard-to-get-to places where we sometimes inject the fertilizer into the sprinklers. This can also be a tremendous labor saver when you consider the fact that we don't have to send a man carrying a 100 pound bag of granular fertilizer climbing up into some awkward bed."

Sprinkler systems, both overhead and drip, are all hooked up to automatic timing devices which saves Zessau's maintenance crew countless hours. Taken a step further, Zessau explained that some of the development's sprinklers are even more sophisticated — triggered automatically when tensiometer readings in a given bed fall below a certain moisture level.

Landscape technology obviously has come a long way from the days of peat moss and a hoe. For John Zessau, it's taken what would have been a horticultural pipe dream twenty-years ago and made trees grow over six story underground parking lots, made roses flourish in steel and concrete; and helped ivy thrive for miles over a thin layer of sand and backfill mix. **WTT**

# WE CONTROL CRABGRASS, C FOR A VERY LONG TIME WITH

## MARCH

SUN	MON	TUE	WED	THURS	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

## APRIL

SUN	MON	TUE	WED	THURS	FRI	SAT
		2	3			
8	9	10				
15	16	17				
22	23	24				
29	30					

## MAY

SUN	MON	TUE	WED	THURS	FRI	SAT
			1	2	3	4
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

## JUNE

SUN	MON	TUE	WED	THURS	FRI	SAT
3	4	5				
10	11	12				
17	18	19				
24	25	26				

Please read labels carefully, and use only as directed.

Circle 170 on free information card



# GOOSEGRASS AND POA ANNUA NEED VERY EARLY APPLICATION.

THURS	FRI	SAT
5	6	7
12	13	14
19	20	21
26	27	28

THURS	FRI	SAT
	1	2
7	8	9
14	15	16
21	22	23
28	29	30

Now, in established perennial Bluegrass, Bermudagrass, Perennial Ryegrass and St. Augustinegrass turf, Chipco® Ronstar® G gives effective control of Crabgrass, Goosegrass and Annual Bluegrass (*Poa annua*), as well as five other major annoyances to you and your golfers.

Chipco Ronstar G gets them, and gets them good. For up to 120 days with one application. And it can be a very *early* spring application, precisely because of that long residual. So you can get your men out there before the big work-load hits.

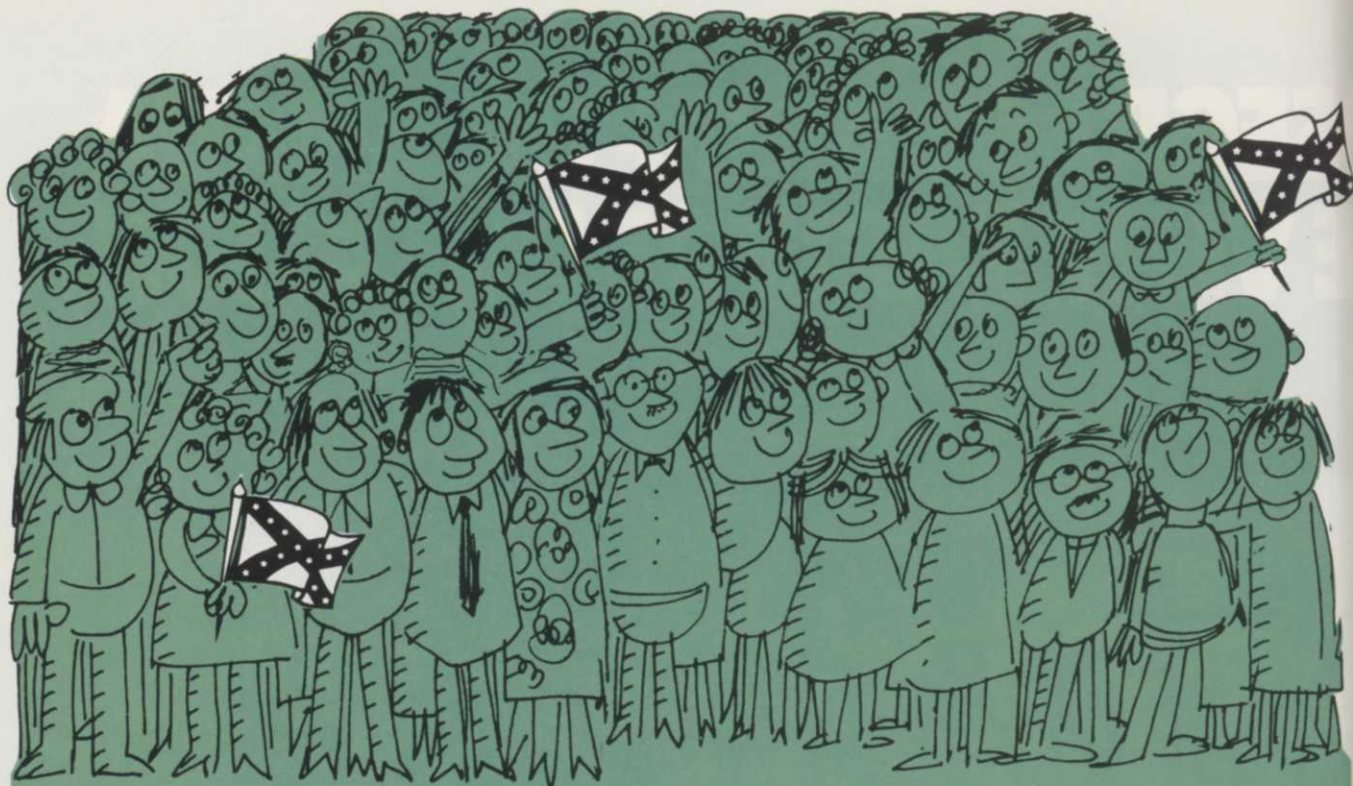
And some more good news. Ronstar G is now available in a new, improved formulation, with larger granules for more even coverage. In addition, research has found you can lower your application rate to 2-4 pounds a.i. per acre, and still get reliable control of Crabgrass and Goosegrass.

Chipco Ronstar G. A welcome addition to the broad Chipco line. For more information, see your distributor or Rhône-Poulenc representative.

Rhône-Poulenc Inc. Agricultural Division, Monmouth Junction, New Jersey 08852.



There's nothing like it.



# They've Joined the Dixie Green<sup>®</sup> Fan Club



Golf professionals, golf superintendents and weekend players alike sing the praises of Dixie Green<sup>®</sup> overseeding mixture. Their reasons are the same: Dixie Green<sup>®</sup> produces a smooth, true and beautiful putting surface that will last the winter through. Here's what some of the professionals have said about it:

*"I mowed 15 days after sowing Dixie Green<sup>®</sup> and was on my way to the prettiest putting surface I have ever seen." Bob Martin, Superintendent Clarksdale Country Club, Clarksdale, Mississippi.*

*"Dixie Green<sup>®</sup> has given me a uniform, dense putting surface that has putted consistently true. The color has been outstanding . . . even though the temperature in January dropped to 11 degrees F. Bent greens went off color . . . but Dixie Green<sup>®</sup> came through like a champ." Ed O'Donnell, Superintendent Brook Valley Golf & Country Club, Greenville, North Carolina.*

Dixie Green<sup>®</sup> overseeding mixture is a premier mix of Highlight Chewings-type red fescue which was judged World Champion at the 45th Annual Royal Agricultural Show in Toronto, and Derby turf-type perennial ryegrass. This fine mix has proven a winner for winterseeding of greens, tees and aprons all over the South. Dixie Green<sup>®</sup>—a great mixture for you and your members.

For further information and free brochures write:



**INTERNATIONAL SEEDS, INC.**

Dept. D • P.O. Box 168 • Halsey, Oregon 97348 • (503) 369-2251 • TWX 510/590-0765

## PRODUCTS



**Life-Time Products** offers an elevating platform trailer capable of hauling two tons of cargo over the highway. The platform hydraulically lowers completely to the ground or can be raised up to 40 inches to accommodate most truck and dock heights. The bed maintains a level plane when raised and lowered, avoiding load damage due to cargo shift. The trailer is designed for one-man loading and unloading of heavy items.

The unit can be pulled by a properly equipped pickup truck and is furnished with standard equipment such as battery-operated hydraulic pump, electric brakes, DOT lights and reflectors, safety chains and ball type hitch for over-the-highway use.

Various cargo boxes, livestock racks, and stake sides are available as optional equipment. Inquiries on custom application are also accepted.

Circle 701 on free information card



**ZZZ-CUT** has been introduced by Products for Energy Inc. as an all-in-one line clearance system. It features a four-wheel drive, all-terrain prime mover; a boom-mounted, hydraulic power saw; and a hydraulic rotary cutter to undercut underbrush.

The telescoping boom reaches 50 feet and swings 360 degrees with a joy stick control. The ZZZ-CUT power saw can sever a 7-inch limb in two seconds.

Power includes a Chrysler slant-six industrial gasoline engine or John Deere Diesel and a four-speed

synchro-mech transmission for a cruising speed of 45 mph. Off-the-road, ZZZ-CUT switches from 2-wheel to 4-wheel-drive. A special hydrostatic drive puts an infinite range of speeds between zero and four mph without using a clutch.

All wheels are controlled with



### Vermeer Stump Cutters: Chew Out Ugly Stumps Without Eating Up Budgets

Stumps. You can burn them. Bulldoze them. Saw them. Or, chop them. But if you really want to remove them efficiently, sink some teeth into your stump removal program with the Diggin' Dutchman's patented Stump Cutters from Vermeer.

They're quick. They're easy to operate. They're economical.

Five hydraulically operated models to fit any size operation. Each equipped with a powerful cutting wheel that can dig them out . . . in minutes. In one trip. With one operator. On virtually any stump around. Vermeer Stump Cutters . . . widely used by cities, parks, cemeteries, golf courses, landscapers, utilities and tree service firms everywhere. Ask your Vermeer dealer for a demonstration today. You'll be glad you did.

# Vermeer



®THE DIGGIN'  
DUTCHMAN

6303 New Sharon Road • Pella, Iowa 50219 • (515) 628-3141 • Telex 478-309

Circle 168 on free information card

# Royer equipment... a selection guide for grounds maintenance superintendents



Circle 110 on free information card  
**WOODSMAN LAND CLEARING MACHINES** clear acres a day to ground level. Reduce dense brush, trees to mulch...discharge downward. Self-powered model for dozers, loaders; PTO drives for tractors, Unimogs.



Circle 112 on free information card  
**BRUSH CHIPPERS** for high performance, low maintenance. Feature self-feeding anvil with one-piece chipping rotor-flywheel-blower... "swing-away" blade access. Self-powered and PTO tractor models.



Circle 111 on free information card  
**HIGH CAPACITY SHREDDERS** for processing topsoil, composted leaves, air-dried sewage sludge. Feature continuous shredding, mixing, aerating, trash-oversize removal. Capacities to 125 cu. yds./hr.



Circle 113 on free information card  
**POWERSCREENS** for preparing superfine top dressing mixes. Powered vibrating screen with elevating conveyor for direct truck-loading, stockpiling. Choice of gas or electric drive. Two models.

## ROYER

**ROYER FOUNDRY & MACHINE CO.**  
173 Pringle St., Kingston, Pa. 18704  
717-287-9624

full power steering, making it possible to weave in and out of 8-foot openings, turn through a 9-foot inside radius or slip under a 10'6" clearance.

ZZZ-CUT has four axle blocks to lock the wheels plus four individually-controlled outriggers for stability. Options include a fiberglass bucket to mount on the boom in place of the power say, or a steel work platform.

Circle 702 on free information card



**The Hefty Grade-All** is a new compact grader introduced by the Hefty Tractor Company. It features an economical 27-horsepower gasoline or optional diesel engine and an all-gear transmission with six forward speeds and one reverse.

Standard equipment includes a hydraulically controlled, multi-function grader blade, power steering, and front weights.

Available options include a front-mounted, dozer blade-scarifier assembly; rear-mounted blade with angle, tilt and offset capacity; snow plow; warning lights; R.O.P.S. bar; mid-mounted rotary and flail mowers.

Circle 703 on free information card



**The 1979 Swinger 200** has been introduced by Dynamic Industries. Designed with an SAE operating capacity of 2005 pounds, the Swinger 200 is powered by a water-cooled, 52 (SAE Net) horsepower gasoline engine with an optional diesel engine offered.

Features include a 20-degree front-rear frame oscillation, four-wheel hydrostatic drive and 80-degree articulated steering. Controls

# Working 2 Shifts.

Whether it's in open sun or moderate shade, Glade Kentucky bluegrass produces beautiful lawns.

Under trees, beside buildings, in up to 60% shade Glade produces deep green turf; has a higher level of resistance to most races of powdery mildew, stripe smut and leaf rust.

Planted in open sun, Glade goes to work the same way. Germinates quickly, establishes fast, forms a thick rhizome and root system, resulting in dense, low-growing turf. Glade Kentucky bluegrass has better than average resistance to today's Fusarium blight, works as a vital fortifying ingredient in many professional turf grass mixtures. Glade Kentucky bluegrass is a Rutgers University selection (tested as P-29). Its name is your guarantee of physically pure, genetically true seed.

Specify Glade Kentucky bluegrass, available at your local wholesale seed distributor. It works 2 shifts, sun and shade.

Another fine, quality-controlled product of Jacklin Seed Company.

**Glade**  
**Glade**  
KENTUCKY BLUEGRASS

U.S. Plant Patent 3151





# Funding the future

Professor H. B. Musser has made an investment in the future. He is the developer of Penncross Bentgrass, Pennlawn Fescue, author of the book *Turfgrass Management*, and a noted educator.

Professor H. B. Musser devoted his career to grass seed research. As a tribute to this outstanding Pennsylvania State University Turf Seed Agronomist, the Musser Foundation was formed.

The foundation's purpose is to assist graduate students in turf research through a fellowship program. This means students who have finished their undergraduate work and are going into turf research may receive financial assistance at this critical point in their careers. Only the interest earned from the H. B. Musser Fund will be used for fellowships, so the dollars you contribute keep on working in perpetuity.

If you or your company are involved in the sale or use of turfgrass or turfgrass-associated products or services, there's no better way to help yourself and the future of the turf industry than an annual contribution to the Musser Foundation.

Contributions may be made in the name of a loved one through the Memorial Fund, or to the Turfgrass Research Fellowship Fund.

"A fellowship involves an exceptional graduate student doing needed research, writing a thesis, adding to turfgrass literature and providing leadership for the future."

---

THE MUSSER INTERNATIONAL TURFGRASS FOUNDATION  
of the H. B. Musser Turfgrass Fellowship, Inc.



Please send contributions in care of:

**Dr. Fred V. Grau**  
P.O. Box AA  
College Park, MD 20740

---

A nonprofit organization dedicated to fostering Turfgrass as a learned profession; to enhancing the lives of people all over the world through Turfgrass, and to supporting education and research in Turfgrass development and management.

consist of a standard steering wheel and two foot pedals. Convenient right-hand levers control all bucket lift and tilt functions.

Other models with SAE operating capacities of 1251 pounds and 3012 pounds, and a complete line of rough terrain lift trucks are also available.

Circle 704 on free information card



Rokor has introduced two models of tree diggers and is working on a third. Model TD-32 will dig up to a 3-inch diameter tree with a 32-inch ball. Model TD-40 will dig up to a 4-inch tree with a 40-inch ball. Model TD-54, when introduced, will dig up

to a 6-inch tree with a 54-inch ball.

Model TD-32 weighs 1070 pounds and will dig a 28-inch deep, 420 pound ball. It measures 71½ inches across and will set or dig trees within 36 inches of walls or fences. It is designed so that the opened frame is the same width as when closed.

Stem supports are gusseted for extra strength. The stems slide over pins instead of on tracks or stem guides for smoother, positive blade insertions. Blades are offered with a choice of pointed, for sandy soils, or frustrum for clay soils.

Circle 705 on free information card



R&D Sprayers have designed two models of hand-held sprayers that can distribute chemical with ac-

curacy in small plot work, parks, golf courses, and areas where large equipment is prohibited.

The sprayers are light-weight, non-corrosive and are available with one- or three-gallon containers. The sprayers are equipped with CO<sub>2</sub> cylinders and feature all aluminum, multi-nozzle spray booms. A single-nozzle spray boom is available for band or directed application.

An operations manual is included which defines calibration and has charts showing quantity of formulated product required per gallon of spray solution based on total spray per acre, recommended rate and product formulation.

Circle 706 on free information card

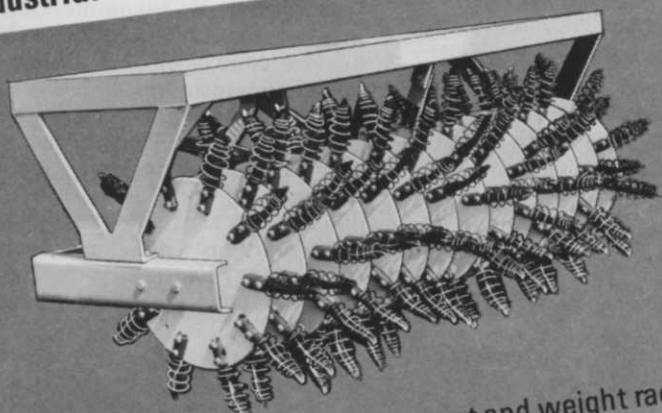
Pinto Reclamation Mixtures of grass seed have been introduced by Lofts Pedigreed Seed and Jacklin Seed Company. The mixtures are specially formulated for use in the reclamation and restoration of land in areas where it is extremely difficult to grow grasses.

Four Pinto brand mixtures are

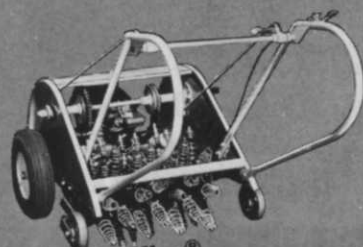
# Hahn

## THE TURF PROFESSIONALS

A complete line of Aerifiers for fairways, athletic fields, industrial and institutional lawns... at prices you will like!



**TM-140**  
6 ft. swath. Three-point hitch mount and weight rack.  
Also available with wheels and hydraulic lift.



**JR-3 Aerifier®**  
2 ft. swath. Self-propelled,  
fast and maneuverable.



**AB-1 Aeri-Boy**  
4 ft. swath. Simple flip-over permits  
quick transport.

Optional Spoons and Blades for double utility.  
Also available — a complete line of Thatchers.

**Hahn** 1625 N. Garvin St., Evansville, In. 47711

**DEALERS WANTED (812) 424-0931**

Circle 128 on free information card

# Myers

FIBERGLASS TURF SPRAYERS



TL10 and 40 Series



VTL10 Series

Myers fairway and general turf maintenance sprayers offer non-corrosive fiberglass construction throughout. Agitator assembly is stainless steel. Wide choice of optional running gear, PTO or engine drive. 100 and 200 gallon tanks. Write for our catalog.

See us in San Antonio, Booths No. 2425-27.

**Myers**  
**TurfLine**

F. E. MYERS CO. DIVISION OF  
400 ORANGE STREET, ASHLAND, OH 44805 **McNEIL**  
CORPORATION

Circle 107 on free information card

To get overseas trade leads like this,  
you could open offices in 127 countries.

Or use our computer.



The U.S. Commerce Department's computer-operated Trade Opportunities Program (TOP) can supply you with immediate, continuing, specific leads tailored to your sales objectives for any of 127 countries. So if you can't be all over the world at one time, we've got the answer. To learn more, write Secretary of Commerce, U.S. Department of Commerce, BIC-9C, Washington, D.C. 20230.



A Public Service of This Magazine & The Advertising Council

available, each formulated for specific combination of soil pH and moisture: Dry Acid Mixture; Moist Acid Mixture; Dry Alkaline Mixture; and Moist Alkaline Mixture. All will adapt in areas from coast to coast where cool season grasses are grown.

Pinto Reclamation Mixtures were formulated for such applications as the revegetation or reclamation of fire-damaged areas, strip mines, highway, ski trails and similar projects. The mixtures can be applied with any hydroseeder or conventional seeding equipment.

A Pinto brand Wildflower Seed Mixture is also available to add color or enhance any "back to nature" area.

Circle 707 on free information card



Chipco 26019, a new turf fungicide with a 14-21 day spray interval, has been registered by EPA, according to the Agricultural Division of Rhone Poulenc Inc.

Foliar applied, Chipco 26019 (Iprodione) is recommended for preventative and curative turfgrass disease control on golf courses, sod farms and institutional areas where fine turf is grown. It is registered for control of dollar spot, brown patch and Helminthosporium, leafspot, and melting out. Testing has shown that Chipco 260219 will also control the benomyl resistant strain of dollar spot, according to Jack Davies, general manager of the Agricultural Division.

The fungicide is applied at rates of .75 to 1.0 ounce of active ingredient (AI) per 1000 square feet (M) to control dollar spot and brown patch, and 1.0 ounce AI/M to control Helminthosporium.

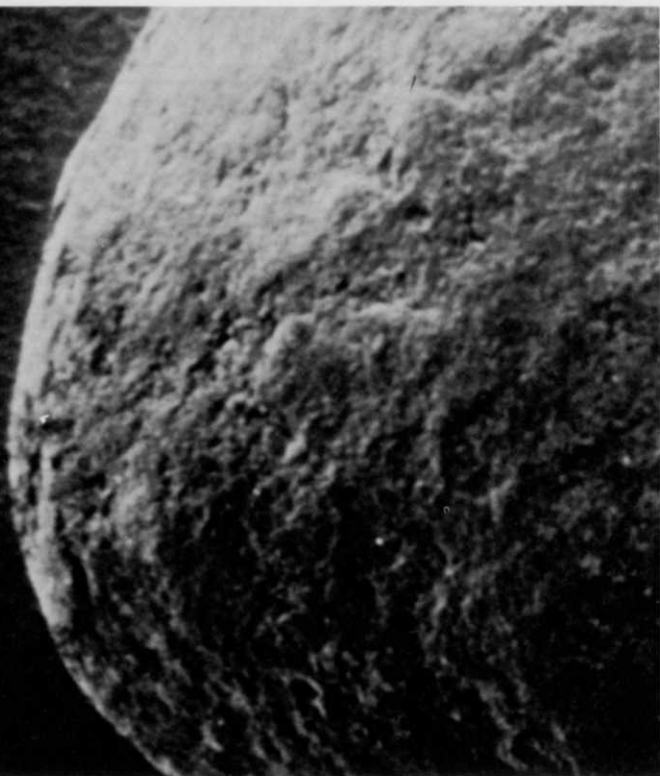
Chipco 26019 is formulated as a 50 percent wettable powder (WP) and is available in two pound bags packed six to a carton.

Circle 708 on free information card



# THE BIGGEST VALUE IN CONTROLLED RELEASE NITROGEN!

Magnification of sulphur coated urea granule



If you're a lawn  
applicator . . .

If you're not using  
Sulfur Coated  
Urea . . .

**READ THIS!**

Then call us toll-free at:

East of the Mississippi

1-800-321-5951

In Ohio Dial 1-800-362-7413

Or Call Collect 216-323-7544

If you're a lawn applicator and you're not using LESCO 36 Sulfur Coated Urea in your program, it's costing you money, it's costing you performance, and maybe it's costing you customers.

LESCO 36 Sulfur Coated Urea is a giant leap for turf management. This controlled release nitrogen source delivers a guaranteed minimum of 36% nitrogen and 12% sulfur. Between 10 to 20% of the nitrogen is available within the first 7 to 10 days, with the remainder available over a period of several months. This means quick greening, sustained feeding and reduced application costs. And because you buy from Lakeshore, you buy from the manufacturer. And that means quality and savings.

If you are a truckload buyer, take advantage of our toll-free information service and call Barb today. She'll have our representative contact you immediately. Those east of the Mississippi can reach her by dialing 1-800-321-5951. (In Ohio, dial 1-800-362-7413.) If you're west of the Mississippi, call Barb collect at 216-323-7544.

Take that small step and call today. We'll be glad to tell you about LESCO 36 and our other fine LESCO Products, such as LESCOSAN (Betasan\*), the liquid pre-emergence crabgrass control that outsells all the competition. Our LESCO Quality Products and Friendly Service are always as close as your phone.

\*(Betasan—Registered TM of Stauffer Chemical Company.)

## LESCO PRODUCTS

Division of Lakeshore Equipment & Supply Co.  
300 S. ABBE ROAD, ELYRIA, OHIO 44035

A FAMILY OF FINE PRODUCTS—Lescosan 12.5G—Lescorene—Lesco 4—Lescobor—Lescopar—Lescopex—Lesco Non-Selective Herbicide  
Lesco MSMA—Lesco Thiram 75W—Lescozyme—Lakeshore Chinch Bug & Sod Webworm Control

Circle 117 on free information card

## CLASSIFIEDS

When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, Dorothy Lowe, Box 6951, Cleveland, Ohio 44101.

Rates: All classifications 65¢ per word. Box number, \$1. All classified ads must be received by Publisher the 5th of the month preceding publication date and be accompanied by cash or money order covering full payment. Mail ad copy to: Dorothy Lowe, Weeds, Trees & Turf, P.O. Box 6951, Cleveland, Ohio 44101.

## USED EQUIPMENT

**2 — 50' AERIAL BASKETS**, brush chipper, stump cutter, 2 sprayers, small crane. Parkway Tree Service, 12026 West Cherry St., Wauwatosa, Wisconsin 53226. 414 257-1555.

**5 TON NATIONAL CRANE**, 85 ft. on 1971 GMC with 5 yard Heil dump body, excellent condition and hardly used. Used spray equipment. 1973 Bean Mist blower (new). Call P. C. Gould Sales Co., Middlesex Turnpike, Essex, Conn. 06426. 203 767-1636.

**24' MULKEY BELT CONVEYER**, 7 HP Wisconsin gas engine adjustable 180° wheels, excellent condition. Perfect for loading and unloading sod. Harry Murphy, 2715 N.W. 69, Oklahoma City, Oklahoma 73116. 405 842-7177.

**STUMP GRINDERS, chippers, log splitters**, sprayers, bucket trucks, all reconditioned. Let us know your needs. Essco, 5620 Old Sunrise Hwy., Massapequa, N.Y. 11758. 516 799-7619.

**TREE SERVICE LIQUIDATION SALE:** Tree trucks, brush chippers, sprayers, power saws, and various small tools. Novosel's Tree & Landscape Service, R.D. 6, Box 319, Kittanning, Pennsylvania 16201. Phone: 412 543-2202.

**VERMEER M460 4 wheel drive tractor** with TS-30 Vermeer tow spade. Hydraulic angling dozer blade. 65 H.P. Wisc. engine. Excellent condition. \$9000.00 or offer. 312 668-1032 (Ill.).

**WANTED: Used gang mowers**, prefer a 9 gang or larger in the Midwest area that is in good working shape. Call 815 469-9421.

**FOR SALE 18 in. Ryan sod cutter** with Sulky roller, near new. 1 303 683-2265.

## SEEDS

**SOD QUALITY Seeds:** Adelphi, Glade, Cheri, Nugget, Merion, Fylking, Majestic, Baron & Touchdown bluegrasses, also fine fescues. Manhattan ryegrass. Custom mixing available. Michigan State Seed, Grand Ledge, Michigan 48837. Phone 517 627-2164.

**LAWN SEED. Wholesale.** Full line of top quality grasses. Improved bluegrass varieties, fine fescues and fine bladed ryegrasses. We specialize in custom mixing. Oliger Seed Company, 2705 Wingate Avenue, Akron, Ohio 44114. Call collect 216 753-2259.

## HELP WANTED

**OUR EXPANDING OPERATION** enables us to offer several excellent opportunities for highly qualified experienced individuals in the following areas: 1) Landscape Design/Sales; Responsibilities include: negotiating with architects, developers and contractors to secure landscape construction contracts; estimating and bidding; site-design; scheduling and supervision of 3 to 5 crews; and complete coordination of landscape construction projects. Successful applicant will have a Bachelors Degree in Landscape Architecture and 1 to 2 years experience or the equivalent in experience. — 2) Landscape Foremen; responsibilities include: proper installation of plant material and landscape features including grading; correct use and care of equipment; and supervision of crews. Successful applicants will have 1 to 3 years of experience in the landscaping industry with at least 1 year in a supervisory capacity and knowledge of reading blueprints. — 3) Landscape Maintenance Foreman; responsibilities include: proper care and maintenance of plant material (i.e. fertilizing procedures, spraying, mowing, pruning and cultivation); correct use and care of equipment; and supervision of crews. Successful applicants will have 1 to 3 years of experience in landscape maintenance with at least 1 year in a supervisory capacity. These are year-round positions with excellent starting salaries and full company benefits. If you feel you are qualified for one or more of these positions described above, and you are an ambitious, self-motivated, knowledgeable individual who enjoys a challenge and one who takes pride in his work, then you are what we are looking for. Please contact our office immediately. Bob's Green Thumb Landscaping Co., Inc., Rae Ann Borst, Secretary, RR 1, Box 131, Mundelein, Illinois 60060. (312) 634-9300.

**GOLF COURSE TURF PROFESSIONALS:** An opportunity to sell Pro Turf® products. ProTurf Division of O.M. Scott & Sons, the nation's leading manufacturer and marketer of professional turf products, has openings for Technical Representatives in several territories. The Tech Reps selected will call on golf course superintendents, requiring a knowledge of turf management and an understanding of these professionals' needs. Applicant should have a BS degree or equivalent in one of the agronomic sciences. Excellent starting salary plus bonus, automobile, and a comprehensive benefits program at no cost to employees go along with these positions. Send resume in confidence to Dick Stahl, Director of ProTurf, O.M. Scott & Sons, Marysville, Ohio 43040. An equal opportunity employer.

Continues on page 100

Embark®  
Plant Growth  
Regulator

is available at these locations:

Wilbur-Ellis Co.  
696 Naplus Street  
P.O. Box 935  
Chula Vista, CA 92012  
Attn: Ralph Cramer

Wilbur-Ellis Co.  
P.O. Box 1286  
Fresno, CA 93715  
Attn: Don Niboli

VanWaters & Rogers  
1363 South Bonnie Beach Place  
Los Angeles, CA 90023  
Attn: Paul Sanders

Moyer Chemical Co.  
1310 Bayshore Highway  
P.O. Box 945  
San Jose, CA 95112  
Attn: Donald Meyer

VanWaters & Rogers  
2256 Junction Avenue  
San Jose, CA 95131  
Attn: Bevan Cates

Moyer Chemical  
230 East Dyer Road Unit  
Santa Ana, CA 92707  
Attn: Pat Sano

Wilbur-Ellis Co.  
14111 Freeway Drive  
Santa Fe Springs, CA 90670  
Attn: Mike Bell

Walter W. Fuchs  
Turf Products Limited  
2N255 County Farm Road  
West Chicago, IL 60185

Riley Lawn & Golf Equip. Corp.  
6810 Guion Road  
Indianapolis, IN 46268  
Attn: Robert Scobee

The Dalton's Incorporated  
U.S. 30 East  
P.O. Box 246  
Warsaw, IN 46580  
Attn: Don Dalton

W. F. Miller Co.  
1593 South Woodward  
Birmingham, MI 48011  
Attn: Russ Hancock

R. L. Gould Company  
3711 Lexington Avenue North  
St. Paul, MN 55112  
Attn: Gordon Miller

Turf Supply Company  
2970 Dodd Road  
St. Paul, MN 55121  
Attn: John Kolb

VanWaters & Rogers  
3950 Northwest Yeon Avenue  
Portland, OR 97210  
Attn: Romeyn Kruiswyk

Wilbur-Ellis Co.  
P.O. Box 8838  
Portland, OR 97208  
Attn: Gordon Hidman

VanWaters & Rogers  
8201 South 212th  
Kent, WA 98031  
Attn: John W. Barber

Wilbur-Ellis Co.  
1200 Westlake Avenue North  
Suite 10000  
Seattle, WA 98109  
Attn: Jack Fisher

Reinders Brothers, Inc.  
13400 Waterwon Plank Road  
Elm Grove, WI 53122  
Attn: Ed Devinger



## Is Turfgrass Managing You?

# Embark® Plant Growth Regulator Puts You In Command—



\*Read label instructions carefully  
before application.

Embark® is a registered trademark of  
the 3M Company.

### Slows Turf Growth When and Where You Need It.

This spring and summer, you decide when to send your mowers into action!

Embark® Plant Growth Regulator reduces turf growth without injuring grass or inhibiting root development. That means less mowing and more time for other jobs.

A spray application of Embark® Plant Growth Regulator on actively growing turf lasts up to eight weeks.

For hard-to-mow areas—roughs, along fences, highway embankments—Embark® Plant Growth Regulator keeps most commonly-grown species\* of grass on hold. Saves equipment and labor. Plus takes the pressure off a busy season.

This year make Embark® Plant Growth Regulator part of your turf management. It's the common sense way to cut mowing and trimming costs.

Distribution of Embark® Plant Growth Regulator for commercial turf is planned for many areas of the country this season. For a listing of Embark® Plant Growth Regulator distributors in your area,

write: Agrichemicals/3M  
223-6SE, 3M Center  
St. Paul, MN 55101

# 3M

**GROUND PERSONNEL.** Excellent opportunities in desirable academic environment with good benefits program. Midway between Houston and Galveston with good climate and year-round recreational activity. Foreman: Experienced, will develop and direct grounds personnel, able to be certified as pesticide applicator. Arborist/climber: Experienced in all areas of tree maintenance. Equipment operator: Operate a variety of standard heavy duty power grounds equipment. Irrigation specialist: Maintain and operate 70 acres of irrigated turf and landscape. Submit complete resume with salary history to: Director of Physical Plant, University of Houston at Clear Lake City, 2700 Bay Area Boulevard, Houston, Texas 77058. UH/CLC is EO/Hdcp/AA/MF Employer.

**HORTICULTURE FACULTY Asst./Assoc. professor** to teach intro., to plant Science, soil conservation, plant propagation, arboriculture in new facilities. Qualifications: Master's degree in plant science is minimum plus four years practical field experience in at least two of the following areas. Greenhouse management, nursery management, soils and landscape maintenance. Teaching experience is desirable. Interest in relating to two year college level students is necessary. Hiring range: \$12,500-\$17,000. Closing date for applications: April 30, 1979. Send resumes to Willard T. Keane, Affirmative Action Office, SUNY, Agricultural and Technical College, Delhi, New York, 13753. An equal opportunity/affirmative action employer.

**GRANDVIEW, MISSOURI.** Director of parks and recreation. Administer parks and recreation department programs and services, including a budget of \$236,000 and six full-time employees. City of 27,000; 129 acres of park land, including 71 acres developed and two municipal pools. Salary range \$16,247-\$21,792. Requires a knowledge of administrative principles and concepts, program planning, and budget preparation. Management experience, familiarity with personnel administration, and knowledge of horticulture and landscaping desired. Send applications to City Administrator, Municipal Offices, 1200 Main, Grandview, Missouri 64030 by February 15, 1979.

**POSITIONS OPEN NOW** Leading horticultural services company in Houston, Texas (established, 1959). Major expansion program requires experienced working crew supervisors and assistants in Landscape Maintenance Division (leading to superintendent positions). Chemical Division (industrial weed control and chemical lawn maintenance) and Landscape Division — experienced all levels. All divisions, including Indoor (plant leasing & greenhouse) offer career opportunities for untrained, but willing to learn. Apprentice program, promotions, excellent fringes. Year round, no layoff jobs. The Spencer Company, P.O. Box 16113, Houston, Texas 77002. Call Len Spencer (713) 691-3991.

**LANDSCAPE SUPERVISOR and urban forestry supervisor.** The city of Milwaukee Bureau of Forestry is currently seeking two professionals to administer its tree division and landscape division programs. Strong management experience and technical training in the areas of urban forestry, landscape architecture, ornamental horticulture, or in a related field is required. 1978 salary range: \$21,095-\$25,662, with entry up to \$22,814. For further information or application contact: City of Milwaukee Personnel Department, 200 E. Wells Street, Milwaukee, Wisconsin 53202. 414 278-3380. An equal opportunity employer.

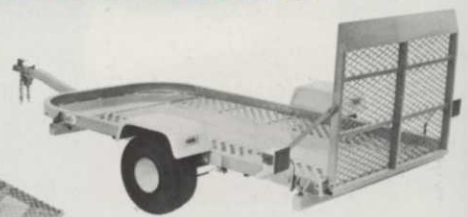
**GROWTH OF ESTABLISHED CHICAGO lawn care firm** offers opportunity for individuals with proven performance record. Facility manager: Seek seasoned professional with strength in operations management. Service supervisor: Experience necessary for management of \$200,000 plus accounts and service staff. Agronomy/turf background and field experience desirable. Service technicians: Experience desired, but will train growth-oriented person. Send qualifications or call for immediate consideration. Sherry Roethe, c/o Tempo 21, Inc., 195 E. Kehoe, Carol Stream, Illinois 60187. 312 682-3201.

Continues on page 103

# Snowco offers the all around utility trailer line



Model 20-005 with standard wheel covers



Model 20-002 with standard hub caps

Take your choice of seven flatbed trailers with loading ramps or tilt decks, plus a box bed trailer with tailgate. They're ideal for hauling grounds maintenance equipment and other bulky, hard-to-handle items.

Two trailers with ramps; both with perforated steel decks. Capacities 1,150 and 2,100 pounds.

Five trailers with perforated steel tilt decks. Capacities 1,000 to 3,500 pounds.

One steel box bed trailer with optional canvas or fiberglass cover. Capacity 1,200 pounds.

Send Coupon Today



## Snowco

Division of Beatrice Foods Co.  
4386 McKinley, Omaha, Nebr. 68112  
Please send Utility Trailer Information

Name \_\_\_\_\_  
Firm \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

# Vegetation Problems?

# Spike®

is the tough one!

Try  
Spike  
granular  
also

## Spike lasts longer than most other herbicides with fewer pounds per acre!

When applied in accordance with label directions, commercial field use has demonstrated that Spike remains effective longer than other products tested, preventing regrowth and permitting lower application rates in succeeding years.

## Spike resists lateral movement!

Spike is non-volatile, control stays where it is needed instead of "shifting" into unwanted areas, enabling specific placement.

## Spike gets many vines, brambles and woody plants!

More than 5 years of development, testing and commercial use have proven Spike's effectiveness against a wide spectrum of vegetation, especially the tough perennials, tenacious vines and so-called hard-to-control species, like mullein, pigweed, curley dock and Kochia.

## Spike gets many of the brush species the others leave behind!

The most persistent vegetation control problem is brush. Spike helps solve that problem almost any time of year.

## Spike provides versatility and easy application!

Commercial use has demonstrated equal effectiveness for both of Spike's principal product forms...wetable powder for spray application, or granular for mechanical application.

Wherever weed and brush control is the problem... in storage yards, parking areas, tank yards, around buildings and warehouses, along road shoulders and railroad spurs... the ideal remedy is SPIKE. It does what it promises!

Order Spike from your Elanco Distributor today. Spike should be the foundation of your vegetation control program.



Circle 140 on free information card

SPIKE is a registered  
trademark for  
Elanco Products  
Tebuthiuron

## ELANCO



# FAIRWAY PHANTOM

Now you see it, now you don't. Suddenly it's gone... like a phantom. It's a Ditch Witch Modularmatic vehicle with vibratory plow, a rig that installs golf course irrigation systems without digging trenches.

It handles the job so quickly that it doesn't even have to stop course play.

## Vanishing Act

It pulls pipe and control wire underground in one simultaneous operation... leaving nothing but a thin slit in fine golf-course turf... and that quickly disappears.

No scars from trenching.

It places pipe as deep as 30 inches and is the fastest way to handle the job in a wide variety of soils.

## Choice of HP


Vibratory plow modules are available for R30, R40, R65 and R100 vehicles from 30- to 100-HP-class. Or you can choose a Combo module for R30, R40 or R65 units, and have both vibratory plowing and trenching capabilities in a single unit.

## Watch it work

Call your Ditch Witch dealer for a free demonstration. Or contact the Charles Machine Works, Inc., P.O. Box 66, Perry, Oklahoma 73077. TWX 910-830-6580. Call Toll Free (800) 654-6481.



**DITCH WITCH IS  
THE ANSWER!**

Ditch Witch and  are registered trademarks of the Charles Machine Works, Inc.

**IMMEDIATE OPENING** for an Industrial Weed Control Manager. Small rapidly growing company needs manager to run this division of our company. Must have sales experience, minimum five years experience in weed control, and willingness to be cross-trained for work in other divisions. Company car or truck, salary plus commission, health insurance, please send resume and salary requirements to Industrial Weed Control Co., 4811 Carnegie Avenue, Cleveland, Ohio 44103.

**LANDSCAPE CONSTRUCTION/MAINTENANCE FIELD SUPERVISORS.**

Positions available for aggressive young people qualified to handle the responsibility of heading a landscape construction and/or landscape maintenance crew. Openings in our Dallas, Houston, Oklahoma City offices. Good company benefits. Great opportunity to grow with a rapidly expanding company. Salary negotiable. Contact: Landscape Design & Construction, Inc., Maintain Incorporated; 2549-2559 Southwell, Dallas, Texas 75229.

**LANDSCAPE ARCHITECTS.** Immediate openings for landscape architects (with less than 5 years experience) in the design department of progressive design/build firm. Positions in Dallas and Houston, Texas. Good company benefits. Salary negotiable. Please send resume and/or portfolio to Landscape Design & Construction, Inc., 2559 Southwell, Dallas, Texas 75229.

**LEWIS TREE SERVICE** is looking for qualified representatives. Several locations. We desire people with professional training and field experience. Any inquiry welcome. Send resume to Phillip J. Brogan, Lewis Tree Service, Inc., 110 Pulaski Street, Syracuse, N.Y. 13204. 315 422-5163.

**EXPERIENCED LANDSCAPE MAINTENANCE FOREMAN** to supervise crews on residential and/or commercial projects. Also chemical applicator to be responsible for tree and shrub spraying, lawn and weed control. Contact Clifton Landscape Company, 8435 E. 41st., Tulsa, Oklahoma 74145. 918 627-9555.

**GOLF COURSE CONSTRUCTION SUPT. AVAILABLE:** Heavy experience, all phases. Also qualified in design, production of working plans. Inquiries: Superintendent, 1125 West Cherry, Cherokee, Iowa 51012. 712 225-2721.

**FOR SALE**

**AERIAL BASKETS, digger-derricks,** stump cutter, brush chipper and Prentice loader. 414 354-8730. Allied Enterprises, 9102 N. 75th St., Milwaukee, Wisc. 53223.

**TREE SERVICE FOR SALE in sunny Florida.** Well established business, will sell all or part. Skyworker on 1970 Chevrolet, excellent condition. M & M chipper, late model. Vermeer 630 stump-er 1973 one owner, good condition. 1973 Chevy C30 flat bed dump. All equipment has been well maintained by owner personally and in excellent operative condition. Call 305 847-4264.

**FOR SALE OR TRADE** one of Colorado's finest sod farms. Best of location, soil, buildings, equipment and etc. Gross income potential up to \$750,000.00 or more, will trade for good wheat or farm land. Broker inquiries welcome. Calhan Realty 1 303 683-2262.

**TREE FARM FOR SALE: 7½ acres.** Northwestern Idaho. Equipment included. Area of great natural beauty. Lorraine Patterson, Century 21 Crowley Realty, 301 Ross Point Road, Post Falls, Idaho 83854. 208 773-4561; 208 773-4464.

**6 CYL 12" Mitts & Merrill chipper** with Torque converter. Excellent condition, \$3300. Asplundh 6 cyl 16", fully reconditioned, \$3800. Edwards Tree Service, 49090 Cooper Foster, Amherst, Ohio 44001. 216 988-4478.

**WIRE STAPLES, 11 guage,** 1000 per box, send \$21.00 per box, F.O.B., Annapolis, Maryland. Wm. H. Foster Landscaping Company, 10 N. Taylor Ave., Annapolis, Maryland 21401.

**WAYNE THREE WHEEL streetsweeper model 1-980,** four speed two range transmission, six cylinder Chrysler industrial engine, three yard capacity, asking \$3,000.00, call TRCT 609 443-1113.

**JACOBSEN F20 tractor** with blitzer mowers, 3 years old, excellent condition. Gem Sod Farms Ltd., R.R. 6, Edmonton, Canada T5B 4K3, 403 973-3311.

**STUMP CUTTER, Vermeer 1560,** good condition. Sheehan Tree Ser., 1944 Ridge Rd., W. Rochester, N.Y. 14626. 1 716 225-1850.

**WANTED TO BUY**

**SEMCO GRAVE DIGGING MACHINE.** Used, in good condition. Buyer must provide one year warranty. Write Box 55136, Coon Rapids, Mn. 55433.

**LINDIG OR ROYER soil shredders.** 50 yards an hour or larger. Art Lewis, Taylor Rental, 355 5th Street, S.W., Winter Haven, Florida 33880. 813 299-2106.

**WANTED TO BUY: Aerial baskets,** 50 ft. minimum, used chippers, 12 in., used Bombardier equipment. Contact Glenn Bennett at O. T. Corp. 313 727-7558.

**BECK BIG ROLL sod harvester,** any condition. Call collect 716 343-2828.

**USED CHIPPERS** and stump grinders must be reasonable. Cooper Foster Tree Farm, 3190 Cooper Foster, Vermilion, Ohio 44089. 216 967-6750.

**WANTED: Hydro seeder,** 800 gallon or larger. Len K. Furma, 1305 Alabama, Ames, Iowa 50010. 515 292-3349.

**AERIAL BUCKET in good condition.** 332 N. 67th St., Milwaukee, Wisconsin 53213.

**WANTED: Ryan Jr sod cutter.** 201 363-8153 before 8 a.m.

**EQUIPMENT FOR SALE**

**NEW PRINCETON TOW boy sod harvester,** \$9,900.00. Jerry Bellini, 302 478-2660. Wilmington, DE.

**MISCELLANEOUS**

**START YOUR LANDSCAPING CAREER NOW!** Write: School of Landscape Design & Sales, Lake City Community College, Lake City, Fla. 32055. Fully accredited and V.A. approved.

**REAL ESTATE**

**ALABAMA SOD FARM. Variety lawn grasses.** 125 acres with underground irrigation system. 7 acre reservoir includes bonus of fish. 60 acres currently under production 4 types grass; another 50 planted or sprigged. Good 5 room and bath home, paneled throughout; 50 ft. equipment shed. Pecan trees, fig, and you'll have your own bee tree. 2 drilled wells. Irrigation pumps, motors included. Owner retires; you get the value. \$250,000, excellent terms by owner. Strout Realty, P.O. Box 6, Andalusia, Alabama 36420. 205 222-4681.

**NURSERY STOCK**

**MILLIONS OF SEEDLINGS:** High quality of reasonable prices. Over 100 selections for Christmas trees, ornamentals, windbreaks, conservation, wildlife food and cover, etc. Free catalog, Carino Nurseries, Box 538B, Indiana, PA 15701.

**BUSINESS OPPORTUNITIES**

**WANT TO BUY OR SELL a golf course?** Exclusively golf course transactions and appraisals. McKay Golf & Country Club Properties, 15553 N. East St., Lansing, Michigan 48906. Phone 517 484-7726.

**LEARN LANDSCAPING and the Growing of Plants at home.** Start a satisfying business or hobby. Free booklet. Lifetime Career Schools, Dept. A-602, 2251 Barry Avenue, Los Angeles, Ca. 90064.

**Next month**

Thatch as seen by turf specialists. Five major papers on this basic problem of turf maintenance.

# Hypro sprayer pumps

Choose from a wide range of pump designs and materials to suit your requirements: cast-iron, Ni-Resist and bronze pump housings... even nickel plating on piston pumps.

## PISTON PUMPS



**Series 5200  
Big Twin**  
10 gpm output  
at 400 psi with  
6 hp engine

**Series 5400  
4-Cylinder**  
25 gpm output  
at 600 psi



## ROLLER PUMPS

Choice of nylon, polypropylene or rubber rollers.



**Series 6500**  
7.6 gpm at 100 psi  
6 gpm at 200 psi  
4 hp gas engine  
Other models  
up to 44 gpm  
at 50 psi.

## CENTRIFUGAL PUMPS

**Series 9200.**  
Output to 124 gpm.  
Pressures to 70 psi.  
Speed of 4200 rpm.



Send for your **FREE**  
Sprayer Pump Handbook

**Hypro**  
A DIVISION OF LEAR SIEGLER, INC.  
347 Fifth Ave NW, St. Paul, MN 55112 • (612) 633-9300

# Michigan State Students Honored at Conference



**Gary Carls** (left) received the Michigan Turfgrass Foundation's (MTF) Norman W. Kramer Outstanding Scholar Award. Carls is a two-year student at Michigan State University (MSU). **Patrick Klein** (center), also a two-year student at MSU received the MTF's Outstanding Student Award. **Thomas Smith** (right), received the Burt Bradshaw Outstanding Student Award. Smith is a four-year student at MSU.



Left: **Ron Juip** presents a check from the Michigan Sod Producers Association to **Gordon LaFontaine**, president of MTF, for support of turfgrass research at MSU. Below: **Alan Nielsen** (left) and **Steven Brown** (right) received the Upjohn Company Scholarship Awards from **Robert Yarborough**, the area sales representative. Nielsen is a two-year turf management student at MSU and Brown is a four-year student.



**James Sparling**, two-year turf management student at MSU, is presented with a GCSAA scholarship by **Ted Woehrl**, past president of that organization.







Before you do anything to your lawn this spring, the following should be of interest and great help:

**NATURE'S METHOD** produces **THE GREEN MAGIC SYSTEM**

**TO REINFORCE WHAT YOU ALREADY KNOW...**

1. Nature has a method and a rhythm that makes plants (lawns) grow healthfully & beautifully.
2. Man has a distinctive ability that quickly destroys Nature's positive responses. For instance, it is common knowledge that:
  - A. Chemical fertilizers create lush growth and make the plants more susceptible to infestations of insects, diseases and other undesirables — plus reduce the plants ability to withstand unfavorable weather and environmental conditions (heat, cold, drought, excessive wet spells, etc.)
  - B. Continual applications of chemicals and pesticides kill the beneficial soil bacteria that decompose Mat and Thatch which convert this accumulation into the necessary organic matter (humus) that builds a more productive soil. Stopping this natural beneficial process creates excessive Mat & Thatch accumulation that makes an ideal media for fungus disease and insect growth that quickly invade and weaken the grass.
  - C. Misapplications and applications of the wrong products destroy the soil, make the soil more compact, so compact that air, water and nutrients cannot penetrate, causing short shallow root growth of desirable grasses making the grass weak and unable to cope with undesirable conditions and unable to heal from the wounds.
  - D. The list is endless . . .

**YOU CAN STOP THESE AND OTHER DESTRUCTIVE ACTIONS**

by converting your operations into a more simplified and exacting program that will produce better and more beautiful results with the assistance of Nature.

Agro Chem's GREEN MAGIC SYSTEM is NATURAL and far more exact than anything you have done to date and anything that is currently available to you.

**LEARN HOW YOU CAN BENEFIT FROM NATURE.**

Call or write us today for complete literature and details of how you can start working with nature.

This program is ideal for Large and Small Lawn area Managers and is The Most Complete Program for companies offering lawn spray services to residential and commercial firms.

Programs and packages are available for all types of lawn areas. Dealerships are available for custom spray operators.



Phone: 312-455-6900

11150 Addison Franklin Park, Ill. 60131

**YOUR TOTAL SOURCE FOR PROFESSIONAL MANAGEMENT**

**AGRO CHEM'S Professional spray unit for the small area, and — it is expandable for the larger area.**

The basic unit includes (as pictured)

- 1—Rectangular 300 gallon holding tank — 110 lbs. w/4" fill cap & man way
- 1—250' light weight pressure hose
- 1—Electric hose reel
- 1—Gas engine & special Pump
- 1—Lawn gun with assorted nozzels
- 1—Pressure regulator and bi-pass unit
- 1 each—Suction & Bi-pass hose
- 1—Root feeder



This basic spray rig is designed to fit in a pick-up truck, the tank situated between the rear wheel well and cab of truck. The motor, pump and hose reel on the right side leaving the remainder of the truck bed for other equipment and supplies.



Van pictured shows the basic spray unit in the van, leaving the entire rear area for storage of products.

As you will see, these sprayer units have been designed with a great deal of thought, research, and years of experience. They are designed and built by professionals, for professionals. For more details, either call or write Mr. Joseph.

This basic 300 gallon unit can be expanded to whatever size spray rig desired by simply adding more tanks — eliminates purchasing new equipment as business expands.

**Pictured:**  
16' Flat bed truck carrying 5 — 300 gal. tanks + 1500 gals.  
2 — 500' hose reels & ability to apply as many as 5 different products or any combination required.



Phone: 312-455-6900

11150 Addison Franklin Park, Ill. 60131

# EVENTS

Spray Adjuvant Workshop, Hopkins Agricultural Chemical Co., Holiday Inn - West, Columbia, Mo., **April 1**. Phone: 608/222-0624.

Williamsburg Garden Symposium, Williamsburg Conference Center, Williamsburg, Vir., **Apr. 1-4**. Contact: Mrs. Peggy Sabol, Registrar, The Williamsburg Garden Symposium, P.O. Drawer C., Williamsburg, VA 23185, phone: 804/229-1000, ext. 2370.

Spray Adjuvant Workshop, Hopkins Agricultural Chemical Co., Holiday Inn, Burlington, Iowa, **April 2**. Phone 608/222-0624.

Municipal Tree Inspector Workshop, Grand Rapids, Mich., **April 4**. Contact: Agricultural Extension Service, University of Minnesota, St. Paul, MN 55108, 612/373-0725.

First Annual Meeting of the Lawn and Garden Manufacturers Association, Sheraton O'Hare Hotel, Chicago, **April 8-10**. Contact: Stuart Greenblatt, LAGMA, One Illinois Center, 111 E. Wacker Dr., Chicago, IL 60601, 312/644-6610.

33rd Annual Southeastern Turfgrass Conference, Georgia Costal Plains Station and Rural Development Center, Tifton, Ga., **April 9-10**. Contact: Clara Wheeler, P.O. Box 748, Tifton, GA 31794.

Development of Recreation Areas Conference, Snowbird Village, Snowbird, Utah, **April 18-21**. Contact: The American Society of Civil Engineers, 345 47th St., New York, NY 10017, 212/644-7671.

Southern California Turf and Landscape Institute, Convention Center, Anaheim, **April 18-19**. Contact: Ed McNeill, 1000 Concha St., Altadena, CA 91001, 213/798-1715.

1979 Arizona Turfgrass Conference, Tucson, Ariz., **May 9-10**. Contact: Prof. William Kneebone, The University of Arizona, College of Agriculture, Department of Plant Sciences, Tucson, AR 85721.

A Symposium on Turfgrass Diseases, Ohio State University, OARDC, & Chemlawn Corp., University Holiday Inn, Columbus, Ohio, **May 15-17**. Write: A Symposium of Turfgrass Diseases 1979, 2865 E. Orange Rd., Galena, OH 43021, or phone: Dr. P. O. Larsen, 614/422-6987, or Dr. B. G. Joyner, 614/885-9588.

Western Chapter, International Society of Arboriculture, Rochelle's, Long Beach, Calif., **May 17-18**. Contact: E. C. Bundy, phone: 217/328-2032.

Texas A&M University Turfgrass Research Field Day, TAMU Turfgrass Field Lab, Agronomy Road, TAMU Campus, College Station, Tex., **May 24**. Contact: Dr. Richard Duble or James Beard, Department of Soil and Crop Sciences, Texas A&M University, College Station, TX 77843.

The current issue of WEEDS TREES & TURF carries meeting dates beginning with the following month. To insure that your event is included, please forward it, 90 days in advance, to: WEEDS TREES & TURF Events, 9800 Detroit Ave., Cleveland, OH 44102.

# ADVERTISERS

Adelphi Kentucky Bluegrass .....	63	Johns-Manville .....	19
Advanced Drainage Co. ....	49	Kubota Tractor Corp. ....	28-29
Agro-Chem Inc. ....	105	Lakeshore Equip. & Supply Co. ...	51, 97
American Garden Cole .....	87	Limb Lopper, Robinson Ind. ....	86
Best Products Div., .....	94	Lofts Pedigreed Seed, Inc. ....	Cover 4
Big Trees Today Inc. ....	58	Magline .....	66
Brouwer Turf Equip. Ltd. ....	13	Mallinckrodt Inc. ....	10
Samuel Cabot Inc. ....	70	Manhattan Ryegrass Growers Assoc. ....	Cover 3
Canadian Industries Ltd. ....	79	Mathews Co. ....	8
Champion Sprinkler Equip. ....	76, 96	Merck & Co., Inc. ....	85
Ciba-Geigy, Ag. Div. ....	20-21	Mobile Aerial Towers, Inc. ....	67
Cottage Gardens .....	86	Monsanto Co. ....	74
Creative Sales Inc. ....	61	Mott Corp. ....	61
Davey Tree Expert Co. ....	83	F. E. Myers Co. ....	96
Dedoes Industries Inc. ....	58	North American Plant Breeders ...	27
Deere & Co., John .....	9	Pickseed West, Inc. ....	47
Diamond Shamrock .....	80-81	Rain Bird .....	23
Ditch Witch, Div. Charles Machine Works .....	102	Rhone Poulenc. ....	53-56, 88-89
Dow Chemical, USA .....	7, 36-37	Rockland .....	67
Elanco Prod. Co., Div. Eli Lilly .....	30, 44-45, 101	Rokor, Inc. ....	82
Excel Ind. ....	43	Ross Daniels, Inc. ....	35
E-Z-Go, Div. of Textron .....	68-69	Royer Foundry & Machine Co. ....	92
FMC Corp. ....	4	Ryan/OMC Lincoln .....	33
Foxcroft Dev. ....	41	Sensation Corp. ....	25
General Bandages, Inc. ....	8	Snow Co. ....	100
Hahn, Turf Prod. Div. ....	95	Standard Golf Co. ....	73
Heckendorn Mfg. Co., Inc. ....	31	Stanford Seed Co. ....	60
Herd Seeder Co., Inc. ....	83	Stanley Hydraulic Tools .....	70
Hoffco Co. ....	75	Tee-2-Green Corp. ....	71
Howard Commercial Turf Equip., Inc. ....	15	3M Co. ....	98-99
Hypro, Div. Lear Siegler, Inc. ....	104	Torco Equip. Co. ....	59
International Seeds, Inc. ....	22, 90	Union Carbide Corp. ....	64-65
International Spike, Inc. ....	46	U.S. Gypsum .....	77
Jacklin Seed Co. ....	93	Van Pines .....	6
Jacobsen Mfg. Co., Div. of Textron .....	Cover 2, 3	Velsicol Chem. Corp. ....	72
		Vemco .....	47
		Vermeer .....	91
		Weather-matic Div., Telsco Inc. ....	38

## Advertising Sales Offices


**HEADQUARTERS**  
9800 Detroit Ave.,  
Cleveland, OH 44102.  
216+651-5500.  
**Richard J. W. Foster,**  
General Manager.

**NEW YORK**  
757 Third Ave.,  
New York, NY 10017  
212+421-1350.  
**Brian Harris,**  
Eastern Manager.

**CHICAGO**  
333 N. Michigan Ave.  
Chicago, IL 60611.  
312+236-9425.  
**Joe Guarise, Jeff Dreazen**

**ATLANTA**  
3186 Frontenack Court, NE,  
Atlanta, GA 30319.  
404+252-4311.  
**Richard Gore,** Sales Manager.

**SEATTLE**  
1333 N.W. Norcross  
Seattle, WA 98177  
206+363-2864  
**Robert A. Mierow**



Woodridge Golf Club,  
Lisle, Ill.

Manhattan used on  
cart path wear area  
takes abuse even  
under shady growing  
conditions.

Certified

**Manhattan**

TURF TYPE  
PERENNIAL  
RYEGRASS

Distributed by:

HITNEY-DICKINSON SEEDS INC.

LESLIE STREET  
BUFFALO, NEW YORK 14240

## STILL THE LEADER

There are many fine leafed perennial ryegrass varieties but only one **Certified Manhattan "Turf-Type" Perennial Ryegrass**. Still a leader because those who work with grass on a professional basis know **Certified Manhattan** true to variety.

Each lot of **Certified Manhattan** is tested for seedling fluorescence. If it is over two percent, it cannot be **Certified** as **Manhattan**. Fluorescence indicates contamination by annual ryegrass or other unwanted varieties. So, with all the new fine leafed ryegrasses on the market . . . **Certified Manhattan** still the leader. What's more, we believe the high quality standards of **Manhattan** will keep it "the leader".

FOR MORE INFORMATION

Circle 180 on free information card

**MANHATTAN RYEGRASS  
GROWERS ASSOCIATION**

1349 CAPITAL N.E.  
SALEM, OREGON 97303

### ▪ **Wear Tolerance . . .**

Tests at Michigan State University, using both a wheel and sled, rated Manhattan best for wear tolerance over the other fine leafed perennial ryegrasses tested.

### ▪ **Cold Tolerance . . .**

Michigan State cold tolerance tests ranked Manhattan as one of the most cold tolerant of all the new turf type perennial ryegrasses tested.

### ▪ **Cutability . . .**

Cutability tests at the University of California, Davis, placed Manhattan number one in cutability of the popular varieties of fine leafed perennial ryegrasses tested.

# Arnold Palmer has confidence... in his game and in **Lofts** seed.

- **Baron Kentucky Bluegrass**
- **Yorktown Perennial Ryegrass**
- **Jamestown Chewings Fescue**

Everyone recognizes Arnold Palmer for his golfing ability. However, few know Arnie as a golf course turf specialist. But he is. As a perfectionist he personally makes sure each of his privately-owned courses has a well-designed turf program. . . a program that includes **Lofts**.

We at Lofts Pedigreed Seed are proud that on Arnold Palmer's Bay Hill Club and Lodge in Orlando, Florida, he uses **Lofts Yorktown Perennial Ryegrass** and **Lofts Jamestown Fescue**. Jim Ellison, Golf Superintendent at Bay Hill, claims, "There's nothing better for our overseeding program, particularly when you consider this turf has to stand up to the abuse of 300 rounds of golf daily."

At Arnold Palmer's Latrobe golf club in Pennsylvania, he uses another winner in its field. . . **Lofts Baron Kentucky Bluegrass**

You may consider Arnold Palmer's swing as the ultimate to strive for. Take his lead, too, when you choose grass seed. If an expert like Arnold Palmer uses **Lofts Yorktown, Jamestown** and **Baron**, maybe you should too.



**Lofts  
Pedigreed Seed, Inc.**

Circle 135 on free information card

**Bound Brook, N.J. 08805/(201) 356-8700**

*Lofts/New England*  
Arlington, Mass. 02174  
617-648-7550

*Great Western Seed Co.*  
Albany, Ore. 97321  
503-926-2636

*Lofts Kellogg Seed Co.*  
Milwaukee, Wis. 532  
414-276-0373

*Lofts/New York*  
Cambridge, N.Y. 12816  
518-677-8808

*Lofts/Maryland*  
Landover, Md. 20785  
301-322-8111

Arnold Palmer discusses his overseeding program  
at Bay Hill with Peter Loft.

Note: The Bay Hill Club and Lodge will host  
the Florida Citrus Golf Classic.