Government Cutbacks Force Increased Efficiency

Landscape Management at the U.S. Naval Academy

Turf Seed Yields Off One Third, Shortages Likely

The Soggy Seed Harvest of 1983
The energy behind the idea never runs out.

Good ideas come and go. Even some of the best ideas eventually fade away. Why? Because it takes a constant flow of energy to keep an idea fresh and bright.

DURSBAN* insecticides are a perfect example. 17 years ago they were a good idea. But with the full energy of Dow behind them, they are among the most widely used insecticides on the market.

It all started when Dow developed chlorpyrifos—the active ingredient in DURSBAN insecticides, and still the most effective ingredient available. Since that time, Dow has invested a lot of energy in continual research and development programs to expand the uses and registrations of DURSBAN.

And each new registration means more business for you. More species of insects you can control. More outdoor customers you can serve.

Without Dow behind the idea, you wouldn’t have all the different DURSBAN insecticides. You wouldn’t have DURSBAN 2E and double-strength 4E liquids or new 50W wettable powder to control just about any outdoor insect.

But there’s more. When you use a DURSBAN insecticide you’re plugged into all the product support and marketing expertise Dow has to offer. Dow not only backs DURSBAN products and their performance, it stands behind the industry. Dow contributes financial, educational and research support to the Professional Lawn Care Association and Golf Course Superintendents Association. Dow offers you and your distributor sales literature and training programs to help you manage your business better, valuable incentive programs and a whole lot more.

Remember, anybody can come up with a good idea, but it takes a company like Dow to make it work for you. Agricultural Products Department, Midland, Michigan 48640.

DURSBAN The best idea in bug control.

Dow Chemical U.S.A.
*Trademark of The Dow Chemical Company

Circle No. 109 on Reader Inquiry Card
when seed growers cut and windrowed their crop this year. But then the rain started and didn’t stop for weeks. The crop is not a bumper one any more.

26

Fertilizer Guide:
Part One,
What They Are
And How They Work

The first of three articles by Drs. Funk and Rathjens of Davey Tree Expert Co., describes in detail the fertilizer products on the market today and how they work. This Guide includes tips to fertilizer burn prevention, symptoms of fertilizer problems, and what is in store for the future. Next month will feature tips for applying turf fertilizers and December will focus on fertilization of trees and shrubs. Don’t miss any of this three-part series.

42

Cutbacks Force
Increased Efficiency
For Government

Weeds Trees and Turf survey shows staff sizes and budgets for government landscape managers are falling or frozen while work loads increase. Government landscape managers are forced to turn to more efficient equipment and chemicals to get the job done with the resources at hand.

46

Salem Enlists
Neighborhoods
To Keep Budget in Line

Frank Bellinghausen is lucky. Neighborhood groups are taking on some of the work eliminated by regular cutbacks in budget and personnel. Salem, Oregon, has thus earned the title Tree City USA seven times.

48

Cusimano Navigates
Protocol at Anapolis’
U.S. Naval Academy

The U.S. Naval Academy is home for 4,500 cadets, thousands of tourists, and many visiting dignitaries because Bill Cusimano makes it that way. Working within the protocol of the military, Cusimano plans ahead to keep the military on schedule and prepared for anything.

DEPARTMENTS

Outlook .......................... 6
Green Industry News .............. 8
Golf Update ....................... 10
Landscape Update ............... 14
Government Update ........... 16
Landscape Log .................. 19
Problem Solver .................. 20
Mechanic’s Corner .............. 59
Events ............................. 60
Products .......................... 61
Classifieds ....................... 66
Advertiser Index ............... 68
THE PROFESSIONAL'S CHOICE

For the landscape, irrigation, turf, gardening, and horticulture markets . . . . . . .

ORION is the professional's choice.

• Inventory of fertilizers, sod, turf treatments, herbicides, insecticides, fungicides, and algaeicides available for immediate shipment
• Equipment stock of mowers, trimmers, sprayers, hand tools, etc.
• Full line of irrigation pipes and fittings, sprinkler systems, etc.

For all your industry needs,
Look to ORION
The choice of the professionals!

ORION CHEMICAL, INC.
National Marketing Headquarters
2200 Port Plaza Dr., Suite 315
St. Louis, MO 63146
(314) 878-8260
(800) 874-6220 (CA only)

Circle No. 121 on Reader Inquiry Card
THE MORE PLACES
THE MORE TIME AND

Look around you. Whether you service commercial or residential customers, the more places you find to use Roundup® herbicide, the more you'll save.

Any side-by-side comparison along fencelines, sidewalks or curblines would prove Roundup works considerably faster than string trimmers and other mechanical weed control methods. So the more trimming and edging jobs you do with Roundup, the more time you'll save per call.

A complete weed control program with Roundup can also mean a considerable savings of time and labor on repeat treatments. With a 2% solution of Roundup you can control over 90 kinds of problem weeds—roots and all—so they won't grow back.
YOU USE ROUNDUP®, LABOR YOU’LL SAVE.

What’s more, Roundup leaves no residual soil activity, and it won’t wash or leach out to harm desirable vegetation. That makes Roundup ideal for around shrubs and flower beds, around trees and other areas.

Using Roundup makes good business sense. Look around. The more you do, the more you’ll save. See your herbicide dealer soon.

FOR A FREE GUIDE TO ROUNDUP, CALL 1-800-621-5800 TOLL FREE. IN ILLINOIS CALL 1-800-972-5858.
Seed Country: Working long days adds up to better turf for everyone

The usually sleepy Northwest, seed country to us, is buzzing this summer. Between the rain, field burning and a rash of personnel changes, seed country is more like Wall Street than small towns surrounding grain elevators.

Harvest time is always tense. Everyone works long days driving combines and trucks, processing seed at the cleaning plants, and torching fields when the state says it's alright to burn.

Seed growers like Bill Rose, Willard McLagen, and Dave Dorfler begin each day at 7 a.m. breakfast meetings with their foremen. They are constantly in touch with their crews by radio as the harvest progresses.

The state might tell a grower he has two hours to burn a 300-acre field. The grower must quickly round up enough people from other operations to drive water and torch trucks, much like a volunteer fire department. There are few complaints about helping out. The days are long and the work is hard, but pitching in is a part of life in Seed Country.

Things were rushed even more this year because two valuable weeks of time were lost to rain. Suddenly, unsold seed from last year's harvest, which threatened to drive the price of this year's crop down, became the surplus needed to cover this year's potential losses from the rain.

Right in the middle of all this excitement, the editors of Weeds Trees & Turf show up, asking a bunch of questions and taking lots of pictures. Some people might have told us to get out of the way or come back later. Not the seed people. They asked us to join them at breakfast meetings, in their trucks as they burned fields, at their cleaning plants in full operation, and after a long, hard day for a barbeque. We did it all and felt fortunate to be in the middle of the nerve center of the seed industry.

If they'd make time for us, they'd make time for you too. That's the kind of people they are.

So, next time you buy seed, you might think of it as more than just seed, but a product from a friendly bunch of people working hard to make your turf look as good as it can.
Does anyone rely as acutely on testing as a turf manager does?

A few do.

Pennfine Perennial Ryegrass covers more ground than any other turfgrass variety in the world. This message recognizes the people who made it happen.

For your free full-size (22" x 28") poster of this ad, send your name and address to:
Pennfine Poster #4, P.O. Box 923, Minneapolis, MN 55440. (Watch for the other five ads in this series.)
GCSAA simplifies show travel plans

The Golf Course Superintendents Association of America has chosen Sunflower Travel Agency as the official travel agency of the Las Vegas Conference and Show, Jan. 28 to Feb. 3, 1984. Designation of the agency helps showgoers obtain lower airfares for the show, tournament beforehand, and post-conference travel.

The golf tournament will be held in Scottsdale, Arizona, Jan. 26-27. Headquarters hotel will be the Scottsdale Raddison Resort and Racquet Club. The men's tournament will be played at McCormick Ranch Golf Club. The ladie's will play Orange Tree Golf Club.

The preconference seminars start in Las Vegas Saturday, Jan. 28. The trade show opens on Tuesday, Jan 31. The banquet takes place Thursday evening, Feb. 2. The MGM Grand is the headquarters hotel in Las Vegas. The deadline for early registration discounts is Dec. 31, 1983. Registration packets were mailed in early September. Interested persons should contact GCSAA, 1617 St. Andrews Drive, Lawrence, KS 66044.

SEED

Firms trade players in sales, research

A chain reaction of management changes at the major turf seed companies, starting in early August, continues at press time.

First Mike Robinson, product and marketing manager at Pickseed, left to create his own research and marketing company. Then Steve Tubbs of Loft's Great Western Seed Co. was replaced by Dick Olson of E.F. Burlingham.

Next Gerald Pepin, International Seeds research director and owner of many turf seed patents, moved over to Pickseed. Van Engelen Beheer, Holland, purchased seed grower Willard McLagen's 50 percent interest in International Seeds Inc. in late July. J.L. Carnes, president of ISI retains a 50 percent interest in the company. Van Engelen, a division of Cebeco-Handelsrad of Rotterdam, is one of the oldest European marketers and breeders of turf and forage grass varieties.

These changes leave two seed management positions open, one at Burlingham and one at International. Since there is a limited number of experienced managers of turf seed, it is likely the chain reaction will continue for the next few months.

NURSERIES

AAN's Lederer predicts fall surge in sales

In a special report to the American Association of Nurserymen Board of Directors, Executive Vice President Robert F. Lederer said that important financial and economic indicators are clearly pointing to a potentially strong turnaround for sale of living plants this fall season. In his report, he urged the Board to call on the industry to prepare for a big fall season and to take steps now to help make it happen.

"Plant product retailers should stock up on plants and supplies to make certain that as the turnaround builds, the industry is fully prepared to capture those sales," Lederer said.

"Good fall weather coupled with the vastly improved economy could very well makeup for spring losses."

The primary cause for the weak spring season was the unusually poor weather.

"If we get reasonably good weather this fall, the market will rebound with great strength," Lederer said.

He also suggested that the retail industry begin now with aggressive advertising and promotion programs to help stimulate demand for the fall season.
Make sure you're there when hundreds of lawn care professionals meet to take part in the green industry event of the year...

PLCAA Conference & Show
Indianapolis / Nov. 8-10

LEARN FROM AN ALL-STAR LINEUP OF LAWN CARE INDUSTRY EXPERTS • COMPARE PRODUCTS AND SERVICES • TAKE PART IN EXCITING ROUNDTABLE SESSIONS • NEW SEMINARS • NEW SPEAKERS • FUN SOCIAL EVENTS • NEW LADIES PROGRAM

KEYNOTE ADDRESS
THE LAWN CARE INDUSTRY: PAST, PRESENT, AND FUTURE
JACK VON FOSSEN, President, Chemlawn Corp.

WORKSHOPS
A panel of green industry experts has been assembled to conduct shirt-sleeve workshops focused on management techniques that boost the bottom line:

- BETTER MANAGEMENT FOR SINGLE BRANCH OPERATIONS.
- BETTER MANAGEMENT FOR MULTIPLE BRANCH OPERATIONS.

SEMINARS
Here is a partial list of this year's exciting lineup of speakers and topics:

- GOVERNMENT REGULATIONS: A CLEAR AND PRESENT DANGER
  - RAY RUSSELL, Director, Government Relations, Dow Chemical Co.

- ORGANIZING AT THE LOCAL LEVEL: OUR MOST URGENT NEED
  - JAN OPPENHEIM, Executive Director, Rational Approach to Pesticides, Inc.

TIME IS RUNNING OUT...SEND IN THIS ADVANCE REGISTRATION FORM AND SAVE!

REGISTRATION FEES

<table>
<thead>
<tr>
<th></th>
<th>Advance</th>
<th>On-Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLCAA Members:</td>
<td>$60.00</td>
<td>$75.00</td>
</tr>
<tr>
<td>Non-Members:</td>
<td>$100.00</td>
<td>$115.00</td>
</tr>
<tr>
<td>Spouse/Student:</td>
<td>$20.00</td>
<td>$25.00</td>
</tr>
<tr>
<td>Ladies Program:</td>
<td>$10.00</td>
<td>$10.00</td>
</tr>
<tr>
<td>One Day Registration:</td>
<td>Members</td>
<td>$30.00</td>
</tr>
<tr>
<td></td>
<td>Non-Member</td>
<td>$45.00</td>
</tr>
</tbody>
</table>

- Advance Registrations accompanied by a PLCAA Membership Application and dues payment may register all representatives as members if received by October 24, 1983.

EARLY BIRD REGISTRATION AND RECEPTION
Make plans to arrive Monday, November 7th, and take advantage of the Early Bird Registration and Reception Theme Party (6:30 PM to 8:30 PM). Pick up your badge and convention packet and be ready to go Tuesday morning when the Show opens.

THE TRADE SHOW
The Indiana Convention - Trade Center plays host to a super display of lawn care equipment, suppliers, and manufacturers. See the latest that the industry has to offer, and enjoy the unique "Specials" that several exhibitors are offering this year.

NEW AGRONOMIC ISSUES FOR THE LAWN CARE INDUSTRY
- JOE VARGAS, Michigan State; JACK HALL, VPI; CHUCK DARRAH, Chemlawn Corp.

NEW IDEAS IN EQUIPMENT FOR THE LAWN CARE INDUSTRY
- A review by industry representatives

CUSTOMERS, COMPLAINTS AND CANCELLATIONS
- YOUR CUSTOMERS AND HOW THEY PERCEIVE YOU: RESULTS OF A RECENT MARKETING STUDY
  - CAROL SCOTT, The Barickman Company
- COMPLAINTS: FROM WHENCE THEY COME
  - ALLAN DUEY, President, Jay-Lan, Inc.
- SAVING THE CANCELLATION: A FEW SUGGESTIONS
  - John Kenney, President, Turf Doctor

THE NEGATIVE OPTION TIME BOMB

THE IMPORTANCE OF RESEARCH AND ITS APPLICATION TO KEEP YOUR COMPANY GROWING
- ALTURGEON, Vice President, Research, Tru-Green Corp.

STAYING LIT WITHOUT GETTING TORCHED: STRESS MANAGEMENT
- TOM JADIN, Director, Winnebago Mental Health Institute

NOTE: (1) Any cancellation MUST BE in writing. $10 non-refundable. No refund given after November 1, 1983. (2) Advance registrations will not be acknowledged after October 24, 1983. (3) Hotel reservation cards must be sent directly to the Hyatt or Hilton (overflow). Reservations with the Hyatt MUST be received by October 13, 1983.
ABA defers membership ruling

After a five month nationwide campaign by the National Club Association to protect the private social rights of judges, the American Bar Association House of Delegates has deferred action on a resolution that would make it “inappropriate” for judges to belong to private organizations with alleged selective membership policies.

Resolution 119, sponsored by the ABA Committee on Ethics and Professional Responsibility, seeks to amend the ABA Code of Judicial Conduct. Judges would be banned from maintaining memberships in private, social, civic, service, fraternal and sororal groups which practice “invidious discrimination.” According to the Committee report, these memberships “may give rise to the perceptions by minorities, women and others, that the judge’s impartiality is impaired.” The term invidious discrimination proved to be a trouble spot. It was never clearly defined within the resolution.

In the end, the ABA Delegates agreed to defer consideration of the resolution until its next meeting in Feb. 1984.

McLoughlin settles prior to trial

James McLoughlin, recently resigned executive director of the Golf Course Superintendents of America, will not have to face a jury for alleged gambling violations due to an arrangement his lawyer worked out with the judge in Lawrence, KS, in August.

McLoughlin said earlier he would fight the charges against him, but chose instead to accept good behavior conditions which could prevent charges being recorded. A trial would have required testimony from many GCSAA staffers and board members, a great inconvenience. The arrangement sets a period of time for “good behavior” with the result of charges being dropped. Since McLoughlin lives in New York, and both McLoughlin and the association would like to put this situation behind them, the judge agreed to the special arrangement.

McLoughlin tendered his resignation the end of May, citing the Association’s two-year delay in relocation and the need to be closer to his family in New York, as reasons for leaving. McLoughlin’s directorship had always been riddled with controversy. The press for relocation, alleged gambling violations and financial condition of the GCSA weighed heavily in the Executive Committee’s decision to accept McLoughlin’s resignation. John Schilling, formerly in charge of marketing for the annual conference and Golf Course Management magazine, has been named associate executive director. The Executive Committee is studying requirements for the top post.

Cheeseman leaves turf for teeth

Jerry Cheeseman, the driving force of the Lake City Community College, FL, School of Golf Course Operations, will leave the teaching ranks to enter the University of Florida school of dentistry.

Cheeseman was also director for the Lake City Community College School of Landscape Design and Sales. Cheeseman was very active in state and national golf organizations and was responsible for making the small community college a sought-after school by students from across the country.
FOR A BEAUTIFUL, RUGGED, LOW MAINTENANCE TURF, YOU CAN'T BEAT FALCON!

PENNANT...TOP PERENNIAL RYEGRASS IN THE SUNBELT!

Two proven performers from E.F. Burlingham...Falcon Tall Fescue and Pennant Perennial Ryegrass!

Falcon was developed to produce an attractive, more persistent turf with finer texture, darker color and higher density than other varieties of tall fescue. Falcon shows quick germination, seedling development and good tolerance to warm conditions in the transitional zone. Plus, Falcon offers improved resistance to brown patch and net blotch compared to other tall fescues.

In recent tests throughout the Sunbelt, Pennant topped many of its competitors in overseeding and heat tolerance trials. Pennant was also found to maintain its excellent turf color and quality late into the season. Pennant’s rich, moderately dark green hue, fine leaf blades, and improved mowing properties make it a true champion.

For more information contact:

E.F. Burlingham & Sons.
P.O. Box 217 • Forest Grove, OR 97116
(503) 357-2141 • Telex 36-0274
The grass along the fence in the photo at left was killed with a fast-acting systemic post-emergent herbicide. Obviously, no professional groundskeeper could abide this ugly mess, so the dead vegetation has to be removed with expensive hand labor. The systemic product is recommended for lawn renovation so, naturally, vegetation will grow back as new seeds germinate, resulting in an endless cycle of retreatment, ugly dead vegetation and more hand labor. Clean up a fence line with Dyclomec and vegetation will never again be a problem, because an annual pre-emergent application of Dyclomec will form a vapor barrier and keep the area absolutely clean.

Dyclomec turns Problem Areas into Beauty Spots

... and the vapor barrier eliminates repeated investment of hand labor to clean out dead vegetation.

Dyclomec is surely the most efficient herbicide that has ever been offered to professional landscapers. In fact, it is called the landscaping herbicide.

Now, at last, the groundskeeper can easily and economically achieve that manicured look, which consists of contrast. Of sharply defined areas where immaculate turf is contrasted with areas of beautiful, naked earth. Where ornamentals grow in an area of beds that are free of any distracting growth.

Until the advent of Dyclomec, such pristine landscaping could only be achieved with repeated investments of hand labor to clean out dead vegetation resulting from an endless cycle of regrowth and retreatment with a systemic herbicide.

But once an area has been cleaned up with Dyclomec, hand labor to remove dead vegetation will never again be necessary because an annual application of Dyclomec will keep the area absolutely clean. How is this possible?

On the page at the right are step-by-step illustrations of how Dyclomec works. Understanding its principle will help you discover the many labor-saving, money-saving ways it can help you in landscape maintenance.

We urge you to read it carefully and call us toll free if you have any questions.

Dyclomec Applicator for Uniform Distribution

Because proper distribution of Dyclomec is important, this patented Acme Spred-Rite® G Spreader is the ideal tool. Granules are gravity-fed through deflector spikes that give a uniform pattern. Hold the head high for a wide swath; lower for a narrow swath; remove it for the finest line of control. Regulate flow with interchangeable orifice disks. Spreads any granular material. Lightweight. No moving parts.
Dyclomec with its pre-emergent and post-emergent action is ideal for vegetation control in mulch, or bark around roses and ornamentals, or in flagstone and gravel walkways. It works its way down to the ground and forms a vapor barrier which provides season-long weed control and maximum safety to desirable plants.

How Dyclomec controls weeds without harming ornamentals:

1. Dyclomec is a 2,6-dichlorobenzonitrile, commonly known as Dichlobenil. This unique herbicide goes directly to a vapor stage without going through a liquid stage. It is activated by temperature and soil moisture.

2. This remarkable herbicidal compound of razor-thin crystals is uniquely processed by PBI/Gordon to make a precise granule.

3. Granules are spread on soil surface. Moisture carries the Dyclomec crystals into the upper layer of soil. Because of adsorption by soil particles, lateral movement is minimal.

4. Temperature and soil moisture activate the Dyclomec crystals and they begin to radiate a herbicidal barrier. This continues for an entire growing season, and the spent crystals disappear, leaving no residue.

5. In this vapor barrier, no plant cell division can occur. Seeds trying to germinate in the barrier will die. Sprouts below this zone will be killed as they try to penetrate the barrier.

6. Existing vegetation such as shallow-rooted grasses and annual weeds having root structures in this barrier will likewise be affected and die after two to three weeks.

7. Certain perennial weeds coming out of dormancy and attempting new growth within the Dyclomec barrier will run into the same dead end: they will be killed by the vapor.

8. Dyclomec, when used as directed, does not affect woody ornamentals, shrubs and trees that have deep roots extending well below the herbicidal vapor zone.

Call Gordon's Technical Service Department
If you have any questions about where and how to use Dyclomec, we invite you to call us. Our technical people have a combined experience of 95 years in working with the Dyclomec chemical.

TOLL FREE 1-800-821-7925
In Missouri 1-800-892-7281
CLCA forms review committees

A series of blue ribbon Professional Review Committees are being set up in the 19 chapters of the California Landscape Contractors Association to assist the Contractors State License Board.

Efraim Donitz, president of the CLCA, said the Professional Review Committees will provide qualified expertise to the CSLB during hearings on complaints filed against contractors by home owners.

"We feel it is our responsibility to provide the expert knowledge and experience necessary to arbitrate fairly a complaint by a home owner against a contractor," Donitz said. "We feel it is our responsibility to provide the expert knowledge and experience necessary to arbitrate fairly a complaint by a home owner against a contractor. If a complaint can be substantiated, the contractor should be penalized since he does not represent the industry well. Likewise, if the complaint is not sound, the contractor should be freed of any unnecessary financial burden or harm to his reputation."

NLA accepting entries for awards

The National Landscape Association is currently accepting entries for the National Residential Landscape Awards Program, now in its 14th year. All single family residential properties are eligible. Categories include active use areas, passive use areas, entrance areas (public areas) or the entire residential property. Any landscape professional may enter. The purpose of NLA's program is to recognize landscape professionals who create the design, and those professionals who are responsible for its execution and maintenance; both are awarded certificates when a project is chosen for national recognition. In addition, the property owner is sent a letter of commendation from the president of the NLA.

Entries will be judged on the basis of excellence, as well as practicality of design, selection of plants and materials, execution of the design and maintenance of the project. Scope of the project will be considered only in determining the category of entry.

Projects chosen for national recognition will be announced Feb. 6 at the NLA/GCA Landscape/Garden Center Management Clinic in Louisville, KY.

For an entry form, contact the National Landscape Association, 1250 I Street NW, Suite 500, Washington, D.C. There is a fee and other requirements to enter. Deadline for entries is Nov. 1, 1983.

1984 Galt House in Louisville

The 1984 National Landscape Association and Garden Centers of America Management Clinic will be Feb. 5-8 at Galt House, Louisville, KY. Interested persons should contact NLA at its new address.

the firm's original name was based on the fact "that no other name describes our company as well -- it says who and where we are and what we are in business to do."

The company has also completed its corporate acquisition of the Northern California sod production interests of John Nunes, who will continue his relationship with the company as contract sod grower in Tehachapi, CA.

Pacific Sod's management team now consists of, in addition to Rogers, Bob Goodrich, senior vice president and general manager, Roger Ogilvie, senior vice president and chief financial officer, Jack Gribben, vice president in charge of advertising, Bill Tavener, vice president and general manager of wholesale sales, John Culbertson, vice president and marketing director and Ben Lucas, assistant vice president and general manager for northern California. Lucas and Tavener are located at the company's northern California base in Patterson, the others at Pacific Sod's corporate headquarters in Camarillo.

EVENTS

Bring your slides to Sports Turf Show

The Sports Turf Managers Association will co-sponsor its third educational conference with the National Institute on Park and Grounds Management Nov. 6-10 at the Hyatt Hotel in Birmingham, AL. Turf managers for the Cleveland, Green Bay, WI, and Milwaukee professional sports stadiums will discuss their management systems. Topics to be covered include getting wet fields in shape fast, new low maintenance turfgrasses and field renovation in the Mid-Atlantic states. "Bring your slides and pictures along to share as others can benefit from what you do," 

continued on page 16
TO LEARN ABOUT TREES, OUR PEOPLE START WITH A BOARD.

There's more to tree care than meets the eye. That's why Davey Tree personnel undergo thorough classroom training at the Davey Institute of Tree Sciences. As well as extensive field training.

Something many other tree care companies can't do.

Our supervisors learn insect and disease control. Diagnosis. Tree care production, planning, and quality control.

This way our crews know how to work on your commercial or municipal property safely and correctly.

For a new or ongoing tree care program, Davey can work for you. Look us up in the Yellow Pages. Or write to: Donald J. Shope, VP Tree Care Services, Davey Tree, 117 S. Water Street, Kent, Ohio 44240.

Because you see, trained people backed up by a technical staff cost you no more.

Davey Tree. We don't just care for trees. We learn how to care for them better.

DAVEY TREE
Kent, Ohio • Coast to Coast and Canada
Keeping America Green Since 1909.

Of course, the advantages don't stop there. On the job Davey offers the latest equipment and technology. Free technical advice from our Research and Development Center. And our famous ARBOR-GREEN® two-year fertilizer, available only from Davey.

Put it together, and you can see why Davey's Total Program of grounds maintenance gives you so much more for your money, service for service.
2,4-D May Be Bargaining Point in Pesticide Battle

The workhorse of selective weed control for years, 2,4-D, appears to be a bargaining point in the battle to defend pesticide use in urban areas.

Jerry Faulring, president of Hydro-Lawn in Gaithersburg, MD, and former president of the Professional Lawn Care Association of America (PLCAA), recently predicted 2,4-D could be outlawed at certain levels of government before the end of this year. Faulring based his opinion on a flurry of pesticide legislation at the state and local level during the past 18 months.

The PLCAA, the National Arborist Association, and the 2,4-D Coalition have formed a pro-pesticide coalition called the National Environmental Law Foundation. The group will counter moves by environmental organizations seeking new legislation to ban important chemical tools and require impractical prenotification of owners of property adjacent to sprayed areas. Faulring is on the board of the new coalition.

Faulring suggested in a recent article in Lawn Care Industry magazine 2,4-D use be eliminated if possible since further defense of the pesticide would be difficult considering current local legislation developing against the product. “We could probably muddle through this year and next without 2,4-D by passing the buck for less weed control onto the government, as we did when chlordane was suspended for turfgrass use,” Faulring said. “If we find the solution first (to 2,4-D), we could use our self regulatory advantage as a promotional advantage.”

Another possible sign 2,4-D’s position has changed is the recent sale of many of Dow Chemical’s 2,4-D trademarks to Vertac, a privately held, Memphis-based chemical manufacturer. Chemical Week, a McGraw-Hill publication, speculated the sale of the trademarks was a move by Dow toward products with patent protection. Monsanto and Du Pont have stopped producing 2,4-D leaving SDS Biotech, Vertac and Dow as the only manufacturers in the U.S.

Dow Chemical’s business manager for domestic agricultural herbicides, A. Charles Fischer, said the company will not reduce its capacity to produce 2,4-D, but will not take the product all the way to distributors. Velsicol and other chemical companies have chosen to sell some technical herbicides to reformulators rather than market to distributors. Therefore, Dow’s move could be simply part of a trend of marketing to reformulators rather than to the distributor.

The point is 2,4-D is being used by environmentalists against urban pesticide applicators and Faulring believes the industry can relieve this political pressure by developing an alternative to 2,4-D before legislation requires it.

Some progress has been made in finding an alternative to 2,4-D in agriculture but that has not been true so far in the turf industry. Faulring stresses that 2,4-D is a vital component of turf herbicides and is not an evil toxin as the public has been led to believe. Yet, as agriculture has done, it is wise for the turf industry to also seek substitutes for 2,4-D in case politics win over the facts.
Inquiries serviced for 90 days from date of issue. For those countries outside the U.S., please apply appropriate postage before mailing.

**READER SERVICE INFORMATION CARD 10-83 1**

For more information on products or services mentioned in this issue, circle the corresponding numbers below, fill in appropriate information and mail today.

<table>
<thead>
<tr>
<th>101</th>
<th>108</th>
<th>115</th>
<th>122</th>
<th>129</th>
<th>136</th>
<th>143</th>
<th>150</th>
<th>157</th>
<th>164</th>
<th>171</th>
<th>178</th>
<th>185</th>
<th>192</th>
<th>199</th>
<th>206</th>
<th>213</th>
<th>220</th>
<th>227</th>
<th>234</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>109</td>
<td>116</td>
<td>123</td>
<td>130</td>
<td>137</td>
<td>144</td>
<td>151</td>
<td>158</td>
<td>165</td>
<td>172</td>
<td>179</td>
<td>186</td>
<td>193</td>
<td>200</td>
<td>207</td>
<td>214</td>
<td>221</td>
<td>228</td>
<td>235</td>
</tr>
<tr>
<td>103</td>
<td>110</td>
<td>117</td>
<td>124</td>
<td>131</td>
<td>138</td>
<td>145</td>
<td>152</td>
<td>159</td>
<td>166</td>
<td>173</td>
<td>180</td>
<td>187</td>
<td>194</td>
<td>201</td>
<td>208</td>
<td>215</td>
<td>222</td>
<td>229</td>
<td>236</td>
</tr>
<tr>
<td>104</td>
<td>111</td>
<td>118</td>
<td>125</td>
<td>132</td>
<td>139</td>
<td>146</td>
<td>153</td>
<td>160</td>
<td>167</td>
<td>174</td>
<td>181</td>
<td>188</td>
<td>195</td>
<td>202</td>
<td>209</td>
<td>216</td>
<td>223</td>
<td>230</td>
<td>237</td>
</tr>
<tr>
<td>105</td>
<td>112</td>
<td>119</td>
<td>126</td>
<td>133</td>
<td>140</td>
<td>147</td>
<td>154</td>
<td>161</td>
<td>168</td>
<td>175</td>
<td>182</td>
<td>189</td>
<td>196</td>
<td>203</td>
<td>210</td>
<td>217</td>
<td>224</td>
<td>231</td>
<td>238</td>
</tr>
</tbody>
</table>

**MY PRIMARY BUSINESS AT THIS LOCATION IS:**

(PLEASE CHECK ONE ONLY IN EITHER A, B OR C)

**A. LANDSCAPING/GROUND CARE AT ONE OF THE FOLLOWING TYPES OF FACILITIES:**

- 0005 Golf courses
- 0010 Sport complexes
- 0015 Parks
- 0020 Rights-of-way maintenance for highways, railroads & utilities
- 0025 Schools, colleges & universities
- 0030 Industrial & office parks/plants
- 0045 Condominiums/apartments/housing developments/hotels/resorts
- 0050 Cemeteries/memorial gardens
- 0060 Military installations & prisons
- 0065 Airports
- 0070 Multiple government/municipal facilities
- Other type of facility (please specify)

**B. CONTRACTORS/SERVICE COMPANIES/CONSULTANTS:**

- 0105 Landscape contractors (installation & maintenance)
- 0110 Lawn care service companies
- 0125 Landscape architects
- 0135 Extension agents consultants for horticulture
- Other contractor or service (please specify)

**C. SUPPLIERS:**

- 0205 Sod growers
- 0210 Dealers, Distributors
- Other supplier (please specify)

Approximately how many acres of vegetation do you maintain or manage?

What is your title? (please specify)

YOUR NAME ___________________________ BUSINESS NAME ___________________________

BUSINESS ADDRESS ___________________________ CITY ___________ STATE ______ ZIP ______

TELEPHONE ( ) AREA CODE ___________

I WISH TO RECEIVE (CONTINUE RECEIVING) WEEDS, TREES & TURF EACH MONTH [ ] YES [ ] NO

SIGNATURE ___________________________ DATE ___________
By Douglas Chapman, horticulturist, Dow Gardens, Midland, Michigan

When leaves fall, work remains

November's maintenance log includes projects that assure next year's landscape. The tasks that highlight November are deciduous tree and shrub planting, mulching and winter protection, fall turf fertilization, and dormant lawn seeding.

Moving deciduous plants

After deciduous trees and shrubs have lost their leaves, one can easily transplant them with a high degree of success. The plant's size should really dictate whether to transplant balled and burlapped or bare root. Considering a commercial landscape, most trees and shrubs should be transplanted B and B. Why? Although the plants are dormant, there are still needs for water and a full knowledge that winter conditions are a severe stress on trees and shrubs. When transplanting B and B, not only is the chance of frost heaving reduced, but also the root system is kept moist and, therefore, ready to initiate growth in the spring. After heavily watering the new transplant, one should also mulch heavily. This heavy mulch over the root system helps reduce the effects of winter; reduces water loss and modifies temperature extremes.

Winter protection

 Generally, winter protection is designed to reduce or modify the harsh conditions of winter. For evergreens that means shading from winter sun and/or wind, thereby, reducing sun scald or transpiration damage, e.g. southwest injury. This windbreak, or shading, can be nothing more than snow fencing, burlap, or, after Christmas, used Christmas trees -- anything that will slow down the wind and, thereby, reduce transpiration loss to the foliage. One must remember, the root system is still frozen. Further, those bright, clear sunny days of winter can often result in sun scald and/or frost cracking. Therefore, shading protection against these is extremely important.

Mulch is the landscape's blanket or insulation. It reduces temperature fluctuation during winter, thus fewer “false starts” during early spring. Further, it keeps the plants from being heaved out of the soil. The mulch to be applied can be compost, straw, wood chips, or any organic matter that modifies climatic extremes. Further, it is better to use something that can be left on the beds or worked in, becoming part of the soil-organic matter. This practice modifies winter temperatures, conserves moisture and helps reduce weed competition.

Late fall feeding

Late fall turf fertilization in the northeast is becoming a more current practice. This practice gives one the opportunity to apply fertilizer during a slower maintenance period rather than the busy spring. Further, it places the fertilizer in a position to be utilized early in the spring. Results at Ohio and Michigan State universities have shown that on heavy soils, fall fertilizer can be extremely effective while encouraging early spring green-up. When considering a sandy or well-drained soil, early spring fertilization, after the frost is out of the soil but before growth starts, is still best. One should be alerted that late fall fertilizer should be applied to the soil before it freezes. If here is frost in the soil, the fertilizer will simply leach away and not be effective but when applied prior to the soil freezing, the fertilizer will literally freeze in the root zone and be ready for spring.

Dormant seeding

Dormant lawn seeding can be an effective way of having a quality lawn for early spring. The lawn is prepared in the standard method — rototill the soil, work in the fertilizer, but not seeded in the fall until after dormancy has set in usually Nov. 1 to 15. Further, the newly seeded areas should be mulched to reduce chance of erosion and/or desiccation of seed. The advantages of dormancy-seeding include early spring germination of seed and, therefore, establishment of lawn — even earlier than one could seed during the spring months. Further, the grass becomes established before the weeds start. It spreads the installation of that lawn into a period of the year when horticultural tasks are less demanding.

November's landscape log should include preparation for the next growing season. This preparation is highlighted by deciduous tree and shrub transplanting, winter protection, fall fertilization and dormant lawn seeding. November becomes an important landscape maintenance month. One can dictate the quality of next season's landscape at a period when the press of current landscape maintenance is reduced.
Builders leave weeds

Problem: Our landscaping firm establishes lawns in new housing developments. Often, the builders leave the property in the back undisturbed about 20 to 25 feet from the house foundations. In these areas we find lots of annual and perennial weeds. Even though we follow standard lawn establishment procedures, we still find a lot of perennial, grassy weeds later. The clients think the weeds are in our seed mix. Can we use Roundup or fumigation to kill the weeds prior to establishment? (Ohio)

Solution: Perennial grassy weeds in lawns present serious turf quality problems. Prior to tilling, grading and seed bed preparation, the first step in soil preparation should be to control persistent weeds. This requires use of nonselective herbicides or soil fumigation.

Use of nonselective herbicides such as amitrole, dalapon, or glyphosate should make the existing vegetation easier to manage. However, these chemicals will not have any effect on viable seeds in the soil which may cause problems later. In your situation, soil fumigation is preferred so that all the viable weed seeds in the seed bed are killed.

Application of herbicides or fumigants will add to your job cost. You should explain the weed situation to your customer and tell them how weed control now will save them time and money later.

If the customer selects fumigation, you have two choices, methyl bromide or metham (Vapam). Only certified pesticide applicators can apply methyl bromide, a gas.

Topdressing selection

Problem: Every year we have used either Dacthal or Betasan in the spring for preemergent control of crabgrass in lawns. Still we get a number of calls from clients in the summer about crabgrass problems. What are we doing wrong? We are thinking of using post-emergent materials like DSMA or MSMA. (North Carolina)

Solution: The best approach to crabgrass management in established turf areas is the use of preemergent herbicides like the ones you mention. If you are getting too many calls about crabgrass in the summer, it is important to make an on-site evaluation of the problem to understand why crabgrass is present in the specific areas.

Several factors could contribute to the crabgrass problem. Preemergents herbicides provide a thin chemical barrier which is toxic to germinating crabgrass seedlings. Variable results will occur when this barrier is disturbed by raking, traffic, insect activity, heat, and/or photodegradation of the active ingredient. Check your application timing and consider a second application at half rate.

Success in managing crabgrass with post-emergent materials, like DSMA or MSMA, depends upon proper timing of the application. For best results, the material should be applied to juvenile seedlings (two-leaf stage). Depending on the number of seeds carried over from the previous year, the best you can expect is only 60 to 65 percent control.

Quite often the problem is recognized only when the crabgrass is mature. Variable results have been observed when DSMA or MSMA were applied to mature stands.

Crabgrass after spraying

Problem: Please give some of the benefits of topdressing and the things we should consider when selecting topdressing materials. (Pennsylvania)

Solution: Topdressing is being used widely in the management of quality, golf course putting greens. If properly managed, there are several benefits of topdressing, including thatch control, leveling and smoothing of the soil surface, improvement of soil properties, and winter turf protection.

The topdressing mix should be compatible with the existing soil for the best results. For example, the addition of sand on turf growing on silt loam soil may cause problems in water movement and retention. These will lead to restricted root development.

Since all sands are not the same, as far as water movement and retention, it is important to use only sand which will allow percolation of 4 to 10 inches of water per hour. The United States Golf Association recommends sand sizes from 1.0 to 0.1 mm for topdressing.

Peats also show different properties. If feasible, use excellent, laboratory-tested, commercial mixtures. If you are making your own mixtures, have the sands, peats, and soil tested by a recognized laboratory for percolation rates.

Balakrishna Rao is plant pathologist and Thomas Mog is pest management specialist for Davey Tree Expert Co., Kent, OH.

Questions should be mailed to Problem Solver, Weeds Trees & Turf, 7500 Old Oak Boulevard, Cleveland, Ohio 44130. Please allow 2-3 months for an answer to appear in the magazine.
Subdue gives turf the best protection against Pythium blight and damping-off for the least cost.

Nothing costs less to use than Subdue® to control Pythium blight and damping-off. Because it only takes 1 1/2 fluid ounces of Subdue to cover 1,000 square feet for 10 to 21 days on established turf.

And nothing works as well because Subdue has two-way action against Pythium blight and damping-off. First, Subdue works systemically, to protect your turf from the inside out. Second, Subdue works on contact to control Pythium in the soil.

Subdue will give you control in both established turf and newly-seeded turf. And Subdue's systemic action gives you longer-lasting control than other fungicides. So you not only save on Subdue's low rate, you also save on maintenance and labor costs.

That's why Subdue is the best protection you can get. Because so little goes so far.

Ciba-Geigy, Ag. Div., Box 18300, Greensboro, NC 27419
Rain Dampens
Seed Harvest:
Yields Are Off One Third

A strange weather pattern called El Nino hampers drying and harvesting of seed in the field. Growers ask for disaster assistance.

Imagine you just finished mowing an overgrown lawn when it starts pouring. It rains for two solid weeks. But, you still have to pick up the clippings.

Now you know how the growers of turf seed in Oregon, Washington, and Idaho feel this year.

They face crop reductions of 30 percent or more in 1983 because it rained for two weeks after many acres of seed-laden grass were cut and left in the field to dry. Furthermore, next year's crop will also be affected.

Hardest hit were annual ryegrass, Linn perennial ryegrass, and some of the fine fescues. Tall fescue, perennial ryegrass and Kentucky bluegrass crops were also hurt by the wet weather during harvest. Bentgrasses were not hurt since they are later maturing grasses which had not yet been cut when the rain started falling.

All indications before the rain were that 1983 would be a bumper year. Some growers expected yields of 30-40 percent over 1982. Instead, they weighed their loads after combining to find 600 to 800 lbs. of seed per acre rather than 1,200 lbs. Much of the seed is darker in color from lying in the wet fields. Germination rates are down below 80 percent for some lots of annual ryegrass.

Field burning has been complicated by regrowth and matted straw in the fields after harvest.
Compact enough for tight spaces. Strong enough to go the distance.

When you buy a new John Deere 318 or 420 Lawn and Garden Tractor, you get maneuverability in a strong package that stands up to the daily abuse of big mowing jobs.

Strength begins with a beefy drive-train that delivers smooth, dependable power. Heavy-duty gasoline engines develop 18 and 20 hp in the 318 and 420, respectively. These reliable twin-cylinder engines feature an aluminum block with cast-iron cylinder liners plus full-pressure lubrication to keep them running cooler for longer life.

Hydrostatic drive makes it easy to match travel speed to the job. You control speed and direction with one lever; there's no clutching or gearshifting to slow you down.

Power steering permits even easier handling. It's standard on both tractors to speed mowing in cramped areas. And the 318 and 420 have a 26-inch turning radius. Individual rear-wheel brakes give you quick stops and let you make tight turns.

There's a full line of mowers: a 46-inch center-mounted mower for the 318, a 60-inch center-mounted mower for the 420, and a 60-inch rear-mounted grooming mower for both. There are also more than 50 attachments available for jobs from snow removal to tillage.

Easy servicing increases productivity. So does the human-engineered operator's platform. It features an adjustable high-back cushioned seat and conveniently located color-coded controls.

Visit your John Deere dealer to take a closer look at these maneuverable tractors. Their strength will really show up. So will the dealer's expertise.

For the name of the nearest dealer, or free folder on the 318 and 420 Lawn and Garden Tractors, call 800-447-9126 toll free (Illinois, call 800-322-6796). Or write John Deere, Dept. 50, Moline, Illinois 61265.

Nothing Runs Like A Deere®
Dave Doerfler, a member of the Silverton Hills Growers Association, explains the effects of the rain on his acreage and seed cleaning operation to Shank.

"This has been the wettest July on record," said Dave Nelson, executive director of the Oregon Seed Council. "Some growers in the Willamette Valley and the Silverton Hills lost entire fields because of the rain. Bad burns are common which will affect next year's production."

"Some seed growers will go under this year," states Hugh Hickerson, Linn County extension agent. "Many of the younger farmers are heavily mortgaged to buy land and get started. One bad year can wipe them out."

Seed growers in Oregon are asking for disaster assistance since

---

**Seed Supply Report**

Listings are by cultivar name, company, and supply condition.

A represents supplies to be near surplus, B adequate, and C possible shortage.

**Kentucky Bluegrass**
- Adelphi, Adikes, A
- Admiral, International Seed, B
- America, Pickseed, C
- Aquila, Northrup King, C
- Banff, Pickseed, C
- Baron, Loft's, C
- Bensun, Warrens, A
- Birka, Burlingham, C
- Columbia, Surf Seed, B
- Eclipse, Garfield Williamson, B
- Enmundi, International Seed, B
- Enoble, International Seed, B
- Flynk, Jacklin, B
- Georgetown, Loft's, C
- Haga, Burlingham, B
- Merit, Full Circle, A/B
- Midnight, Surf Seed, C
- Mystic, Loft's, C
- Nassau, Loft's, B/C
- Nugget, Northrup King, C
- Parade, Northrup King, C
- Park, Northrup King, B
- Ram I, Loft's, C
- Rugby, Northrup King, B
- Scenic, International Seed, B
- Shasta, Surf Seed, C
- Sydsport, Burlingham, B
- Touchdown, Pickseed, C
- Vantage, International Seed, B

**Chewings Fescue**
- Adonis, International Seed, B
- Agram, Pickseed, B
- Atlanta, Northrup King, B
- Checker, International Seed, B
- Highlight, International Seed, B
- Jamestown, Loft's, B
- Shadow, Surf Seed, B
- Wintergreen, Northrup King, A

**Creeping Red Fescue**
- Dawson, Northrup King, B
- Ensylva, International Seed, B
- Fortress, Surf Seed, C
- Ruby, Northrup King, B

**Creeping Red Fescue**
- Aurora, Surf Seed, C
- Reliant, Loft's, B
- Scaldis, Northrup King, B
- Spartan, Pickseed, C
- Tournament, Pickseed, B
- Waldina, Surf Seed, B

**Kentucky Bluegrass**
- Adlphi, Adikes, A
- Admiral, International Seed, B
- America, Pickseed, C
- Aquila, Northrup King, C
- Banff, Pickseed, C
- Baron, Loft's, C
- Bensun, Warrens, A
- Birka, Burlingham, C
- Columbia, Surf Seed, B
- Eclipse, Garfield Williamson, B
- Enmundi, International Seed, B
- Enoble, International Seed, B
- Flynk, Jacklin, B
- Georgetown, Loft's, C
- Haga, Burlingham, B
- Merit, Full Circle, A/B
- Midnight, Surf Seed, C
- Mystic, Loft's, C
- Nassau, Loft's, B/C
- Nugget, Northrup King, C
- Parade, Northrup King, C
- Park, Northrup King, B
- Ram I, Loft's, C
- Rugby, Northrup King, B
- Scenic, International Seed, B
- Shasta, Surf Seed, C
- Sydsport, Burlingham, B
- Touchdown, Pickseed, C
- Vantage, International Seed, B

**Creeping Red Fescue**
- Dawson, Northrup King, B
- Ensylva, International Seed, B
- Fortress, Surf Seed, C
- Ruby, Northrup King, B

**Hard Fescue**
- Adonis, International Seed, B
- Agram, Pickseed, B
- Futura Plus, Pickseed, B
- Marvelgreen, Loft's, B
- Medalist, Northrup King, B
- Oregreen, Surf Seed, B
- Ph.D., International Seed, B
- Showboat, International Seed, B

**Overseeding Blends, Mixtures**
- CBS, Surf Seed, B
- Dixie Green, International Seed, B
- Futura Plus, Pickseed, B
- Marvelgreen, Loft's, B
- Medalist, Northrup King, B
- Oregreen, Surf Seed, B
- Ph.D., International Seed, B
- Showboat, International Seed, B

---

24 WEEDS TREES & TURF/OCTOBER 1983
losses are estimated above 30 percent, the requirement set by the government to qualify for low interest loans.

More than 300,000 acres in Oregon are used for production of turf seed, primarily ryegrasses and fescues.

Carryovers from last year of Kentucky bluegrass and perennial ryegrass may help growers meet demand this year, but turf type tall fescues and some fine fescues will be in short supply.

The rain causes a series of production problems. Once the seed crop is cut and placed in windrows to dry, the moisture content of the seed is too high to process. The grower has to wait for the moisture content to drop to 12 percent before combining to pick up the seed. Rain slows the drying of the seed in the field, causes combines to jam when the seed is finally harvested, and encourages seed which has shattered and fallen to the ground to germinate. The regrowth makes the windrows difficult for the combines to pick up. The newly germinated grass is undesirable since only the parent grass produces the right genetic combination.

After the fields are combined, they are burned to destroy unwanted straw, harmful fungi, second generation seed, and to encourage branching of the parent grass during regrowth. The additional branches help produce more seed the following year.

If the farmers don't get a satisfactory burn they can try to burn the fields a second or third time using propane torches at considerable expense. It appears likely that yields for next year will be down because of bad burns.

Doyle Jacklin of Jacklin Seed Co. in Post Falls, Idaho, estimates rain in his area has reduced Kentucky bluegrass yields by ten percent. He blames winter rains for causing fertility problems and another 20 percent loss in yields.

All seed companies report increasing demand for seed brought about by renewed construction and dramatically improved sales to sod growers. "Sod growers in many sections of the country sold out this spring and needed to replant quickly," said Jacklin. "Severe heat in the Midwest this summer should improve renovation business this fall."

If you don't plan on seeding with MUSTANG, you may need this.

Why take chances? There's a new tall fescue whose superior turf quality, disease resistance and dark green color make it a breed apart from the others. Mustang's high seedling vigor and excellent heat and drought resistance make it the one you can bet on. So, don't try your luck—try Mustang.

Available Fall, 1983
Call or write for the distributor nearest you.
Plants require at least 16 elements for proper growth and development. Three of the elements—carbon, hydrogen, and oxygen—are provided by air and water; the other essential elements are obtained from the soil.

The macronutrients; nitrogen, phosphorus, potassium, calcium, sulfur, and magnesium; are used in greater quantities than the other mineral elements absorbed from the soil. (see Table 1) Nitrogen, phosphorus, and potassium are often called the primary nutrients because of the amount used by the plants and their importance in supplemental fertilizers.

The micronutrients; iron, manganese, copper, zinc, boron, molybdenum and chlorine; are required in smaller quantities but are no less important. The so-called “acid-loving” plants have a relatively high requirement for certain micronutrients, and chlorosis caused by an iron deficiency is a common ailment when these plants are grown in alkaline soils (over pH 7.0). Because of reserves normally found in the soil, the addition of supplemental micronutrients is not often necessary unless the soil is excessively alkaline or sandy.

Fertilizers

Fertilizer is any material that supplements the soil’s supply of elements required for plant growth and development. Fertilizers may be categorized as natural organic, synthetic organic, or inorganic based on their source and chemical structure.

**Organic fertilizer** consists of nutrient elements derived from compounds with a carbon structure. The term organic when applied to fertilizer should include only organic materials that are insoluble in water. All living matter—plant or animal—is composed of compounds with a carbon structure. Proteins, fats, carbohydrates and other compounds synthesized by an organism have one common factor—a carbon structure. Any of these materials could be considered as organic fertilizers when placed in the soil. Common examples of **natural organic** fertilizers are animal manure, bone meal, sewage sludge and plant refuse.

Scientists have synthesized compounds with a carbon structure which are also organic. Examples of **synthetic organic** fertilizers are ureaformaldehyde and isobutylene diurea.

**Inorganic fertilizers** are nutrient elements derived from...
sources which are not organic, those which have neither a carbon structure nor which have been derived from living matter. Examples of inorganic fertilizers are ammonium nitrate, ammonium phosphate, potassium nitrate and potassium chloride.

A complete fertilizer contains sources of nitrogen, phosphorus, and potassium. An incomplete fertilizer contains one or two of these elements in any combination, but never all three. Other fertilizer nutrients such as iron or magnesium may be present but are not considered in the definition of "complete" and "incomplete" fertilizers.

**Analysis and Ratio**

Fertilizer analysis or grade is the minimum guaranteed percentage by weight of nitrogen(N), phosphorus (expressed as P₂O₅ equivalent), and potassium (expressed as K₂O equivalent), and is printed on the container in that order.

For example, a 100 lbs. bag of 20-10-5 fertilizer is formulated from a nitrogen source(s) that contains 20 lbs. of elemental nitrogen, a phosphorus source(s) that contains the equivalent of 10 lbs. of P₂O₅, and a potassium source(s) that contains the equivalent of 5 lbs. of K₂O. Any of these elements missing from the formulation would be represented by a zero in the analysis. Ammonium nitrate, for example, which does not contain phosphorus or potassium, has an analysis of 33-0-0.

In addition to the total nitrogen, water insoluble nitrogen(WIN), if present, is also printed on the label as a percent of the total weight. For example, if half of the nitrogen of a 20-10-5 fertilizer is in a water insoluble form, the WIN content is 10%. Although WIN indicates the portion of nitrogen in a controlled-release fertilizer that is slowly soluble, it is not appropriate for coated fertilizers that encapsulate soluble nitrogen. In this case, the controlled-release nitrogen may be expressed in terms of dissolution rate. See Slow-Release Nitrogen for a more detailed description.

Fertilizer ratio is the relative amounts of nitrogen, phosphorus and potassium. A fertilizer with an analysis of 20-10-5 would contain four times as much nitrogen as potassium and twice as much phosphorus as potassium. The ratio then would be 4:2:1.

**Table 2. The essential elements and the forms available to green plants.**

<table>
<thead>
<tr>
<th>Elements</th>
<th>Available forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>NO₃⁻, NH₄⁺, Urea (some)</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>HPO₄²⁻, H₂PO₄⁻</td>
</tr>
<tr>
<td>Potassium</td>
<td>K⁺</td>
</tr>
<tr>
<td>Calcium</td>
<td>Ca⁺⁺</td>
</tr>
<tr>
<td>Magnesium</td>
<td>Mg⁺⁺</td>
</tr>
<tr>
<td>Sulfur</td>
<td>SO₄²⁻, SO₃⁻</td>
</tr>
<tr>
<td>Iron</td>
<td>Fe⁺⁺⁺, Fe⁺⁺</td>
</tr>
<tr>
<td>Manganese</td>
<td>Mn⁺⁺⁺, Mn⁺⁺⁺</td>
</tr>
<tr>
<td>Copper</td>
<td>Cu⁺⁺, Cu⁺⁺⁺</td>
</tr>
<tr>
<td>Zinc</td>
<td>Zn⁺⁺</td>
</tr>
<tr>
<td>Boron</td>
<td>B⁺⁺⁰⁻</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>MoO₄²⁻</td>
</tr>
<tr>
<td>Chlorine</td>
<td>Cl⁻</td>
</tr>
</tbody>
</table>

**Absorption**

All fertilizer nutrients, regardless of the source, are absorbed by plant roots as charged atoms or groups of atoms called ions—nutrient salts (see Table 2). These ions exhibit either a positive or a negative charge which is essential for root absorption by electrical attraction.

Inorganic fertilizers form ions readily when dissolved in water and therefore are quickly available for root absorption. Organic fertilizers—both natural and synthetic—must be hydrolyzed (decomposed) by soil microorganisms from complex compounds to the same nutrient salts provided by inorganic fertilizers. The rate of decomposition is dependent upon soil factors such as temperature, moisture and pH.

**Burn**

Fertilizer burn is the visible symptom of insufficient water in a plant associated with an overapplication of fertilizer salts.

The movement of water across the root cell membrane is regulated by the concentration of dissolved fertilizer salts in soil solution relative to the dissolved salts within the cell. As fertilizer salts dissolve in water, they raise the osmotic pressure of the solution. Water always moves from the side of the membrane with the low osmotic pressure to the side with higher osmotic pressure. Root cells actively absorb fertilizer salts from soil solution, and under normal conditions, maintain a higher osmotic pressure.

If excess fertilizer salts are applied and raise the osmotic pressure of soil solution, water cannot enter the cell and may actively move out of it. The resulting injury is known as fertilizer burn or physiological drought.

Salt index values are a measure of a fertilizer's relative tendency to increase the osmotic pressure of the soil solution. Sodium nitrate has been given a salt index value of 100 and the value for all other fertilizers is relative to an equal weight of sodium nitrate. The higher the salt index, the greater the potential for a fertilizer to increase the osmotic pressure of soil solution and, thus, cause burn. See Table 3 for salt indexes.

Because some nutrient sources are more concentrated than others (have higher percentages of N, P, or K) the actual increase in burn potential is affected by the application rate as well as the salt index. The partial salt index is calculated per unit of each nutrient and compares the rela-
Fertilizer

Table 3. Salt indexes of common fertilizer sources

<table>
<thead>
<tr>
<th>Fertilizer</th>
<th>Formula</th>
<th>% N</th>
<th>% P₂O₅</th>
<th>% K₂O</th>
<th>Salt Index</th>
<th>Partial Salt Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen sources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ammonium nitrate</td>
<td>NH₄NO₃</td>
<td>35.0</td>
<td></td>
<td></td>
<td>104.7</td>
<td>2.99</td>
</tr>
<tr>
<td>Ammonium sulfate</td>
<td>(NH₄)₂SO₄</td>
<td>21.2</td>
<td></td>
<td></td>
<td>69.0</td>
<td>3.25</td>
</tr>
<tr>
<td>Sodium nitrate</td>
<td>NaNO₃</td>
<td>16.5</td>
<td></td>
<td></td>
<td>100.0</td>
<td>6.06</td>
</tr>
<tr>
<td>Potassium nitrate</td>
<td>KNO₃</td>
<td>13.8</td>
<td></td>
<td></td>
<td>73.6</td>
<td>5.34</td>
</tr>
<tr>
<td>Urea</td>
<td>H₂NCONH₂</td>
<td>46.6</td>
<td></td>
<td></td>
<td>75.4</td>
<td>1.62</td>
</tr>
<tr>
<td>Natural organic</td>
<td></td>
<td>5.0</td>
<td></td>
<td></td>
<td>3.5</td>
<td>0.70</td>
</tr>
<tr>
<td>Monoammonium phosphate</td>
<td>NH₄H₂PO₄</td>
<td>12.2</td>
<td></td>
<td></td>
<td>29.9</td>
<td>2.45</td>
</tr>
<tr>
<td>Di ammonium phosphate</td>
<td>(NH₄)₂HPO₄</td>
<td>21.2</td>
<td></td>
<td></td>
<td>34.2</td>
<td>1.61</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phosphorus Sources</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Superphosphate</td>
<td>Ca(H₂PO₄)₂+CaSO₄</td>
<td>20.0</td>
<td></td>
<td></td>
<td>7.8</td>
<td>0.39</td>
</tr>
<tr>
<td>Triple superphosphate</td>
<td>Ca(H₂PO₄)₃</td>
<td>48.0</td>
<td></td>
<td></td>
<td>10.0</td>
<td>0.21</td>
</tr>
<tr>
<td>Mono ammonium phosphate</td>
<td>NH₄H₂PO₄</td>
<td>61.7</td>
<td></td>
<td></td>
<td>29.9</td>
<td>0.49</td>
</tr>
<tr>
<td>Diammonium phosphate</td>
<td>(NH₄)₂HPO₄</td>
<td>53.8</td>
<td></td>
<td></td>
<td>34.2</td>
<td>0.84</td>
</tr>
<tr>
<td>Monopotassium phosphate</td>
<td>KH₂PO₄</td>
<td>52.2</td>
<td></td>
<td></td>
<td>34.6</td>
<td>0.84</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Potassium Sources</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium chloride</td>
<td>KC1</td>
<td></td>
<td>60.0</td>
<td>116.3</td>
<td>1.94</td>
<td></td>
</tr>
<tr>
<td>Potassium nitrate</td>
<td>KNO₃</td>
<td></td>
<td>46.6</td>
<td>73.6</td>
<td>1.58</td>
<td></td>
</tr>
<tr>
<td>Potassium sulfate</td>
<td>K₂SO₄</td>
<td></td>
<td>54.0</td>
<td>46.1</td>
<td>0.85</td>
<td></td>
</tr>
<tr>
<td>Monopotassium phosphate</td>
<td>KH₂PO₄</td>
<td></td>
<td>34.6</td>
<td>84.4</td>
<td>0.24</td>
<td></td>
</tr>
</tbody>
</table>


** Calculated per unit of N, P₂O₅, or K₂O.

tive burn potential of fertilizers based on equal amounts of nitrogen or equivalents of P₂O₅ or K₂O.

Effects of Soil pH

The term pH expresses the relative concentration of hydrogen(H+) and hydroxyl(OH-) ions in solution. A pH of 7.0 means the hydrogen and hydroxyl ions are equal and the solution is said to be neutral. A pH below 7.0 means the solution contains more hydrogen ions than hydroxyl ions and is said to be acid. Similarly, a pH above 7.0 means the solution contains more hydroxyl ions than hydrogen and is alkaline.

Soil pH may influence nutrient absorption and plant growth through the effect of hydrogen ions and their indirect influence on nutrient availability. In most soils the latter effect is the most significant.

The presence of an element in the soil is no guarantee that it is in a soluble form available for absorption. The concentration of hydrogen and associated ions affects soil reaction and the formation of soluble and insoluble compounds. All nutrients must be soluble to be available for root absorption.

Each nutrient has a pH where it is most available because it forms a large proportion of soluble compounds at that particular pH range. See Figure 2 for pH ranges and availability of nutrients.

Plant species differ in their response to the soil acidity.
Because it grows on you.

When the growing gets tough, the Ransomes Motor 180 gets going. With a big 71" cutting width, ideal for golf courses, large public lawns and playing fields. Plus a low center of gravity and wide wheel track for stability on slopes. When you've got a real mowing job, get the reel advantage.

See your Ransomes Bob Cat distributor or call Ransomes, Inc., One Bob Cat Lane, Johnson Creek, WI 53038, (414) 699-2000.

RANSOMES

The grass machine.

Circle No. 216 on Reader Inquiry Card
There's a fine line between good turf and better turf.

It's the fine line of Turf Care™ products from SDS Biotech. These quality products give you first-rate weed and disease control with real economy all season long. Taken together, there's just no better way to get better turf.

Daconil 2787® fungicide. Unmatched spectrum of disease control. No other fungicide works as effectively on turf and a variety of ornamentals. Daconil 2787 provides unsurpassed control of 9 major turf diseases plus common diseases on 45 ornamentals. Daconil 2787 is also available in wettable powder.

Dacamine® 4D herbicide. Kills perennials better than ordinary 2,4-D. Dacamine 4D virtually eliminates the possibility of weed regrowth. It works particularly well on plantain and 70 other tough perennials. Dacamine 4D also delivers broader spectrum weed kill than ordinary 2,4-D.

And since Dacamine 4D is non-volatile, it won't vaporize even in hot weather. So there's no risk of injury to nearby ornamentals from vapors.

2 Plus 2 (MCPP + 2,4-D Amine). Tough on weeds, easy on the pocketbook. Designed in a convenient package mix, 2 Plus 2 delivers economical control of pesky common broadleaf weeds such as clover and dandelion on turf and fairways.

For broad spectrum control that's tender on grass and non-harmful to tree roots, use 2 Plus 2.

Daconate® 6 and Bueno® 6 post-emergent herbicides. Proven performers. Especially effective on such tough weeds as nutsedge, chickweed, wood sorrel, crabgrass and many other grassy weeds.

Both products are ready-to-use liquids with built-in surfactants for uniform wetting (Bueno 6 is sold only in western states for use on turf).

Turf Care from SDS Biotech. Order now for better turf. Your hard work and expertise along with our fine line of Turf Care products are the perfect combination for healthier, more vigorous, more beautiful turf.

So see your SDS Biotech distributor and place your order today.
Geographic trends in soil pH amendment.

because of differences in nutrient requirements. For most plants, a pH of 6.5 fits the availability of most nutrients, without toxic amounts of any nutrient.

However, certain plants—such as rhododendrons, azaleas, pines and camellias—require comparatively large amounts of nutrients that are soluble in acid solution. They are “acid-loving” plants and grow best in soils of pH 5.5.

Soil acidity, as such, is seldom toxic to plants, but below pH 5.5 certain elements such as aluminum and manganese may become soluble to levels toxic to plant growth.

It has also been shown that pH levels affect the rate of of thatch decomposition, since they influence the organisms which break down thatch.

In some cases, nutrient availability can be improved by correction of the soil pH as well as by supplemental fertilization. Sulfur and agricultural lime are the materials used most frequently to alter the soil reaction or pH.

Lime increases the pH (decreases acidity); sulfur lowers the pH (increases acidity).

Ideally, the pH of soil within the root zone of a plant should be measured every three to five years and, if necessary, adjusted to the most favorable range for that particular species. Unfortunately, lowering the pH of an alkaline soil is not always successful, particularly if the soil is inherently calcareous with significant calcium reserves.

Leaching

Leaching is the removal of materials in solution from the root zone. Leaching is caused by percolation, the lateral and downward movement of water through soil. Loss of nutrients due to leaching is proportional to the amount of water percolated through the soil. Water dissolves minute quantities of mineral and organic matter. Soil and weather conditions affect leaching.

All nutrients are subject to leaching, but not to the same degree. Calcium losses are the greatest of any nutrient known. Nitrate salt—the form of nitrogen primarily absorbed by plant roots—moves with ground water and rapidly leaches from the root zone. Magnesium, sulfur and potassium are moderately leached, whereas only a trace of phosphorus is lost.

Primary Fertilizer Elements

Nitrogen, phosphorus and potassium are the three nutrients required in the greatest quantity from the soil. In addition to these, iron is most likely to be found deficient in soils. Soil and tissue analysis can be used to determine the deficiency of any nutrient.

Nitrogen

Nitrogen is required in larger amounts than other elements supplied by the soil. Compounds formed by the plant from nitrogen comprise up to 50 percent of the dry weight of the plant. Nitrogen is a component of proteins, chlorophyll, amino acids and enzymes.

Nitrogen is more often deficient in soils than any of the other essential nutrients.

Plants can absorb nitrogen as either the ammonium (NH$_4^+$) or nitrate (NO$_3^-$). Urea or inorganic forms of nitrogen are converted to ammonium which is subject to volatilization when surface applied. More than 25 percent can be lost to volatilization under certain conditions. The ammonium form of nitrogen may be taken up...
Until now, most tall fescues have come up short. They've failed under extreme temperatures. And fallen victim to disease. But now there's Galway from Northrup King. A versatile, fine-leafed tall fescue that maintains a dense weed-free turf years after ordinary tall fescues thin out.

**Low maintenance turf with a high maintenance look.**
Galway requires only limited amounts of water and fertilizer to produce an attractive, dark green turf. It grows slower, which means less mowing. And its improved fine-leafed texture improves density and uniformity.

**Improved performance against disease and extreme temperature.**
In development, Galway passed the test of fierce Minnesota winters and sweltering Midsouth summers. It passed the test at several northern and southern universities, too, ranking among the best turf-type tall fescues available.

Tests have shown that it won't succumb to brown patch or net blotch. And that its improved shade tolerance makes it well suited for use under trees and in other low-light areas.

It is recommended for athletic fields, parks, playgrounds, commercial and public turf areas, boulevards, embankments and home lawns. New, fine-leafed Galway from Northrup King. It'll change your thinking. Because, in the world of tall fescues, it stands above them all.

Ask your Northrup King distributor about Galway tall fescue. Or write Northrup King Medalist Turf Products, P.O. Box 959, Minneapolis, MN 55440.

Circle No. 119 on Reader Inquiry Card
Fertilizer

by plant roots or transformed to nitrate which is the form most nitrogen is absorbed by plants.

Since nitrate ions are negatively charged, they are not absorbed by soil colloids (negatively charged) and readily move with soil water. Thus, heavy rainfall or irrigation may move nitrate below the root zone.

Because of the transitory nature of nitrogen in mineral soils, soil analysis is not as useful in determining deficiencies as an observation of symptoms. Nitrogen deficiencies are observed as uniformly yellowish-green leaves or needles which are more pronounced in older tissue. Leaves are small, thin and may start dying at the tips. The growth rate is reduced.

Nitrogen sources used for horticultural fertilization are often categorized as quick-release or controlled-release, based upon the rate nitrogen becomes available to the plant.

Controlled-Release

Controlled-release nitrogen sources include both slowly soluble nitrogen, which is an inherent characteristic of the fertilizer, and slow-release nitrogen which is imparted to a soluble fertilizer by an artificial coating.

In general, both types cost more per unit of nitrogen than quick-release sources and provide the following advantages: gradual supply of nitrogen which reduces the number of necessary applications, reduced leaching and reduced volatilization, and lower risk of burning which allows higher application rates.

Slowly Soluble

Slowly soluble nitrogen sources release nitrogen as their chemical structure slowly breaks down. Both natural and synthetic organic fertilizers can be classified as slowly soluble and are broken down by hydrolysis and/or microbial activity into soluble forms of nitrogen.

Natural organics include sewage sludge and plant and animal wastes, generally low in nutrient content.

Knowledge of the relative amounts of urea, methylol urea, and methylene urea contained in liquid UF reaction products can be used as a guide in predicting their potential to cause fertilizer burn.

Fluf would have the least burn potential because it contains less than 16 percent urea with methylene urea as the major UF compound. However, Nitro-26 Plus contains no water insoluble nitrogen and therefore could be considered intermediate in burn potential.

Formolene and GP4341 contain 50 percent urea with methylol urea as the primary UF compound and would have the greatest potential to cause burn of the liquid UF reaction products.

IBDU

Isobutylidene diurea(IBDU) is produced by reacting urea with isobutyaldehyde and is marketed in two size ranges, fine (0.5-1.0 mm) and coarse (0.7-2.5 mm). Urea is released from IBDU through the hydrolytic action of water.

Factors which increase the rate of nitrogen release from IBDU include: 1) decreasing particle size, 2) increasing soil moisture, 3) increasing soil temperature,
OHIO TURFGRASS FOUNDATION

The Nation’s Biggest & Best

Regional Turf Conference

Featuring 230 Exhibits, Lectures / Workshops

- Athletic Field Maintenance • Golf Course Maintenance
- Lawn Care Programming • Grounds Maintenance
- Insects on Ornamentals - Workshop
- Ornamental Care - Workshop
- Turfgrass Insects - Workshop
- Turfgrass Diseases - Workshop
- Herbicide Injury? - Workshop

Annuals & Perennials - Workshop • Mechanics - Workshop
- Turf Insects • Turf Diseases • The Pesticide Controversy • Aquatic Weed Control
- Sand Topdressing • Fertilizers • Triplex Fairway Mowing • Growth Regulators
- Lawn Care Pests • New Fertilizers • Pre-Notification • Regulatory Concerns
- Preventative Maintenance • Turf Herbicides
- Insecticide Update • Fungicide Update • Thatch • Chemical Application • Coring Update
- Soil Testing • Low Volume Spraying • Liabilities on Golf Courses • Structural Pest Control
- Hard to Control Weeds • Drainage
- Golf Course Herbicides • Antracnose • Arsenicals • Application Techniques • Iron Fertilization
- Yellow Patch/Brown Patch • Red Thread/Pink Patch • Grain & Clover Mites

Ohio Turfgrass Foundation and Conference to be held at Cincinnati Convention Center
Cincinnati, Ohio
Dec./5-6-7-8, 1983

Contact Dr. John Street
c/o Ohio Turfgrass Foundation
2021 Coffey Road
Columbus, Ohio 43210
614-422-2047

Circle No. 120 on Reader Inquiry Card
Fertilizer

and 4) increasing soil acidity (lowering pH).

IBDU (Par-Ex) is sold by Estech General Chemical Corp. and contains 31 percent nitrogen which is 85 to 90 percent insoluble, depending upon particle size.

**Slow-Release**

Slow-release nitrogen is produced by encapsulating quick-release nitrogen with an insoluble coating. The soluble nitrogen is released through tiny pores as the coating is broken down in the soil. A mixture of variable coating thicknesses provides continuous release of soluble nitrogen for a controlled period of time. Only two slow-release nitrogen sources are commercially available—sulfur coated urea and Osmocote.

**Sulfur-Coated Urea**

Sulfur-coated urea is produced by coating urea with molten sulfur and then sealing the granule with oil or wax. The soluble nitrogen is released through tiny pores or imperfections in the coating. No two particles are coated the same.

The nitrogen release rate or dissolution rate is determined by placing sulfur-coated urea in water at 100 degrees F. for a seven-day period and is expressed as percent dissolved at the end of that time. Most SCU products have a dissolution rate between 20 and 30 percent. Factors which increase the release rate of nitrogen from SCU include: increasing soil temperature and increasing soil moisture.

Sulfur-coated urea is commercially available with 32 to 37 percent nitrogen from Canadian Industries Ltd., AG Industries Mfg. Corp. (a subsidiary of Lakeshore Equipment and Supply Co.), and O.M. Scott.

**Osmocote**

Osmocote is manufactured by encapsulating soluble fertilizer with a plastic, semiporous coating. Water enters the capsule, dissolves the nutrients, and then diffuses out into the soil for plant uptake. Osmocote is marketed by the Sierra Chemical Corp.

**Quick Release**

Quick-release nitrogen sources are all soluble in water and are either available for root uptake in their present form or are readily converted to available forms in the soil. Inorganic nitrogen fertilizers (do not contain carbon) such as ammonium nitrate and ammonium sulfate are quick-release. Urea, although technically an organic source of nitrogen, is soluble and possesses many of the same characteristics as the inorganics. Organic doesn’t always mean slow-release.

In general, the quickly available nitrogen sources are less expensive than controlled-release sources and have the following characteristics: 1) readily soluble in water, 2) immediately available for absorption, 3) can cause growth flushes, 4) short soil residual, 5) leach and/or volatilize, and 6) high burn potential.

**FAN’s nitrogen release is similar to urea, but its burn potential is much lower.**

**Phosphorus**

Phosphorus is especially important in seedling growth. It is utilized in carbohydrate conversions, energy transfer, and is a component of nucleoproteins and phospholipids. Phosphorus helps maintain a desirable pH in cells and contributes to root development.

Phosphorus deficiencies are most often encountered in seedlings. Leaves or needles turn a dull green becoming reddish-bronze to purple, especially along margins in cold weather.

Some Phosphorus is provided by soil minerals and soil organic matter but it is very slowly available from these sources. Since phosphorus moves very little through soil, supplemental phosphorus tends to accumulate near the application site, moving only a few inches in 50 years.
Perfect Partners
A new concept in slow release fertilizers to give you high performance at an economical cost.

Now you can get all the performance of a slow release fertilizer at a cost lower than most other professional fertilizer products.

New IBDU/SCU™ mixes combine three nitrogen sources—IBDU, Sulfur Coated Urea and Urea—to give your turf short, intermediate and long nitrogen release. This three-stage release results in a constant, even rate of turf feeding that lasts for up to 90 days.

Yet the price of IBDU/SCU fertilizers is less than you would expect to pay.

A First for Turf
New IBDU/SCU fertilizer mixes can provide your turf a combination of features never before available in a single fertilizer. It gives your turf all the benefits of IBDU, the highest performance slow release nitrogen available, with the proven benefits of a high quality prilled Sulfur Coated Urea. Plus, there's water soluble urea to get your turf off to a fast, green start. IBDU/SCU fertilizers are available in a variety of complete mixes, custom formulated to regional turf requirements.

See your local distributor or PAR EX representative about the new IBDU/SCU fertilizer mixes. They just might be the perfect partner for your fertilizer budget.

Estech, Inc.
Professional Products Division
P.O. Box 1996 Winter Haven, FL 33880

*Registration Pending
What's the Economical Solution to Maintaining Big Acreage?

The new HUSTLER 14' Range Wing™. It cuts 115% more turf each pass than 72" mowers...and you won't believe the low price.

Plants take up phosphorus primarily in the orthophosphate form \( (H_2PO_4^-) \). Although soils normally contain relatively large amounts of phosphorus, much of it is in forms not available to plants.

Phosphorus availability is influenced by soil pH. At a pH below 5.5, iron and aluminum form an insoluble complex with phosphorus that is not available to plants. At a pH above 7.5, calcium combines with phosphorus to form insoluble compounds such as calcium phosphate. Phosphorus is most available between pH 6.0 and 7.0.

The most common phosphorus sources for granular application are the superphosphates with a \( P_2O_5 \) equivalent of 20 to 48 percent.

Soluble phosphorus sources include monoammonium phosphate (11-46-0), recommended for alkaline soils, and diammonium phosphate (18-46-0).

Liquid ammonium phosphate (10-34-0) is often used where bulk tank storage is feasible. Mono-potassium phosphate (0-52-34), a soluble, granular product, has an excellent potential as fertilizer because of its high analysis and low salt index. High cost of production has limited its use.

Potassium

Potassium is found in all plant parts in relatively large quantities and functions in catalyzing plant reactions, regulating transpiration, and aiding in the translocation of materials between cells. Although more research needs to be done with turfgrasses and woody plants, potassium is thought to influence rooting and increase heat, cold and drought resistance as well as enhancing resistance to disease.

The effects of potassium on plants are more subtle than the effects of nitrogen because they are not normally expressed visually in terms of growth rate or leaf color. Potassium deficiencies may restrict the translocation of car-
Offer good at participating seed dealers
TURF NURSERY, INC.
P.O. Box 459  Suisun City, CA 94585  (707) 422-5100

This "winner-style" jacket was designed especially for Warren's and the turf professional. This jacket is heavy-duty nylon lined with light-weight flannel for year round wear. Easy-care, machine wash & dry jacket, sports the Warren's quality patch and each is personalized with your name. It's a classic jacket!!! And yours FREE with your purchase of A-34 BenSun® Kentucky Bluegrass Seed...the perfectionist's choice.

For more details contact your Warren's sales representative or seed supplier.

A-34 BenSun, the tailor made Kentucky Bluegrass for the demanding turf professional ... rugged enough to withstand short mowing down to 1/2 inch and still maintain excellent density and wear tolerance. A-34 recovers quickly after damage and makes a clean, green turf ... perfect for golf courses, athletic fields, parks and schools.

And, now with 500 lbs. accumulated purchases of A-34 BenSun, straight or in mixes, this handsome jacket can be yours.

Offer good at participating seed dealers
TURF NURSERY, INC.
P.O. Box 459  Suisun City, CA 94585  (707) 422-5100

Circle No. 132 on Reader Inquiry Card

OCTOBER 1983/WEEDS TREES & TURF  39
THAN SPEED READING?

Do you have too much to read and too little time to read it? Do you mentally pronounce each word as you read? Do you frequently have to go back and re-read words or whole paragraphs you just finished reading? Do you have trouble concentrating? Do you quickly forget most of what you read?

If you answer "yes" to any of these questions — then here at last is the practical help you've been waiting for.

The typical remark made by the 75,000 people at the University of Delaware, and use more of everything you read. They were no longer held back by the lack of skills and poor reading habits. They could read almost as fast as they could think.

What makes Speed Reading so successful?

The new Speed Learning Program shows you step-by-proven-step how to increase your reading skill and speed, so you understand more, remember more and use more of everything you read. The typical remark made by the 75,000 slow readers who completed the Speed Learning Program was: "Why didn't someone teach me this a long time ago?" They were no longer held back by the lack of skills and poor reading habits.

In just a few spare minutes a day of easy reading and exciting listening, you discover an entirely new way to read and think — a radical departure from anything you have ever seen or heard about. Research shows that reading is 95% thinking and only 5% eye movement. Yet most of today's speed reading programs spend their time teaching you rapid eye movement (5% of the problem) and ignore the most important part (95%) thinking. In brief, Speed Learning gives you what speed reading can't.

Imagine the new freedom you'll have when you learn how to dash through all types of reading material at least twice as fast as you do now, and with greater comprehension. Think of being able to get on top of the avalanche of newspapers, magazines and correspondence you have to read . . . finishing a stimulating book and retaining facts and details more clearly and with greater accuracy than ever before.

Listen-and-learn at your own pace

This is a practical, easy-to-learn program that will work for you — no matter how slow a reader you think you are. The Speed Learning Program is scientifically planned to get you started quickly . . . to help you in spare minutes a day. It brings you a "teacher-on-cassettes" who guides you, instructs, encourages you, explaining material as you read. Interesting items taken from Time, Magazine, Business Week, Wall Street Journal, Family Circle, N.Y. Times and many others, make the program stimulating, easy and fun . . . and so much more effective.

Executives, students, professional people, men and women in all walks of life from 15 to 70 have benefited from this program. Speed Learning is a fully accredited course . . . costing only 1/5 the price of less effective speed reading classroom courses. Now you can examine the same, easy, practical and proven methods at home . . . in spare time . . . without risking a penny.

Examine Speed Learning FREE for 15 days

You will be thrilled at how quickly this program will begin to develop new thinking and reading skills. After listening to just one cassette and reading the preface you will quickly see how you can achieve increases in both the speed at which you read and in the amount you understand and remember.

You must be delighted with what you see or you pay nothing. Examine this remarkable program for 15 days. If, at the end of that time you are not convinced that you would like to master Speed Learning, simply return the program and owe nothing. See the coupon for low price and convenient credit terms.

Note: Many companies and government agencies have tuition assistance plans for employees providing full or partial payment for college credit programs.

In most cases, the entire cost of your Speed Learning Program is Tax Deductible.

WHAT’S BETTER THAN SPEED READING?

SPEED LEARNING

(SPEED PLUS COMPREHENSION)

Speed Learning is replacing speed reading. It's easy to learn...lasts a lifetime...applies to everything you read...and is the only accredited course with the option of college or continuing education credits.

I understand that if after 15 days I am not delighted in every way, that I may return the materials in their original condition for a full refund. No questions asked.

If you don’t already own a cassette player, you may order this Deluxe Cassette Recorder for only $49.95. (Includes handling and delivery.)

YES! Please rush me the materials checked below:

☐ Please send the Speed Learning program @ $99.95 plus $4 postage and handling.
☐ Please send the Speed Learning Medical Edition @ $109.95 plus $4 postage and handling.
☐ Please send the Junior Speed Learning program (ages 11 to 16) @ $69.95 plus $4 postage and handling.
☐ Charge my credit card under the regular payment terms.

Visa Master Card Interbank No. Exp. Date

Card No.

I understand that if after 15 days I am not delighted in every way, that I may return the materials in their original condition for a full refund. No questions asked.

113 Gaither Drive, Mt. Laurel, NJ 08054

HBJ1-WTT-1083

Incorporated

Outside USA add $10 per item—Airmail extra

40 WEEDS TREES & TURF/OCTOBER 1983
ARM YOURSELF FOR THE BUSY MONTHS AHEAD

... with vital marketing data gathered by our experts in these proven research techniques:

• WATS Telephone
• Focus Groups
• Direct Mail
• Personal Interviews

We provide top quality in-house printing, mailing, tabulating, data processing, and analytical systems.

Count on us for your special research needs.

Free cost estimates.

Infometrics
National Research Center
A SERVICE OF HARCOURT BRACE JOVANOVICH PUBLICATIONS
131 West First Street
Duluth, Minnesota 55802
Ph: (218) 727-8511

Fertilizer

Both carbohydrates and nitrogen metabolism and are evidenced first as marginal and interveinal yellowing of older leaves. Leaf tips may roll, turn brown and wither. Growth is often stunted.

Potassium mobility in soils is less than that of nitrate but greater than that of phosphates. The available form of potassium (K+)

Iron is the micronutrient most likely to be deficient in much of the U.S.

is strongly adsorbed by clay particles which prevents excessive leaching except on sandy soils.

The most common potassium fertilizer is potassium chloride (0-0-62), although potassium sulfate (0-0-14) is often used in arid regions where chloride is a problem or in commercial lawn care programs because of its lower burn potential.

Potassium sulfate has a lower solubility and may contain insoluble silica fractions. Potassium nitrate (13-0-44) is an excellent fertilizer but generally is not priced competitively with the chloride or sulfate forms. Monopotassium phosphate (0-52-34), as mentioned earlier, has excellent potential as a fertilizer but its use is limited because of its high cost.

Iron

Deficiencies of micronutrients such as iron, zinc, manganese, copper and boron are sometimes found in certain plant species, especially when grown in alkaline or sandy soils. Iron is the micronutrient most likely to be deficient throughout much of the United States and Canada.

Iron is essential for the formation of chlorophyll and its deficiency is initially expressed as interveinal and marginal yellowing of the youngest leaves. Prolonged iron deficiency can result in decreased shoot and root growth because of a lack of chlorophyll to maintain photosynthesis.

Iron deficiencies do not usually result from a lack of iron but rather because the iron is tied up or "fixed" in insoluble compounds. Iron is most commonly deficient in alkaline soils although excessive levels of phosphate, manganese, zinc, and copper can produce iron deficiency. Waterlogged soils can also reduce the availability of iron.

Since iron deficiency is often the result of alkaline soil reactions, acidifying soils would appear to be a practical solution. Calcareous soils, however, may have large reserves of calcium to buffer attempts to lower the pH, particularly if the soil is fine textured. Relatively large amounts of sulfur may be required over a number of years to correct the pH of clay soils.

Compounds containing iron can be applied to the foliage, soil, or, for trees, injected or implanted into the trunk.

Materials for foliar and soil application include inorganic salts, such as ferrous sulfate and ferric nitrate, available from agricultural and horticultural distributors; and chelated forms, such as Sequestrene from Ciba Geigy and Ferriplex from Miller Chemical and Fertilizer Corp. An organic product called Eagle-Iron from Eagle-Picher Industries Inc., is effective for iron deficiencies in crops and is being tested for turfgrasses and woody plants.

Iron from inorganic salts is quickly combined into insoluble forms in alkaline soils and little remains available for plant use. Chelated iron reacts slower with soil components and improve the continued availability of iron.

For trunk injection or implantation of chlorotic trees, iron salts such as ferric citrate and ferric ammonium citrate are available from laboratory chemical distributors or may be ordered through a pharmacy.
Government Cutbacks Force Increased Efficiency

Park superintendent job grows as staff size and budgets shrink

By Maureen Hrehocik, associate editor

The economy has put a tight lid on government landscapers' budgets, and according to the results of a Weeds Trees & Turf survey, staff sizes have stayed the same or decreased.

The average budget for government maintenance in 1983 is $270,000, with an average $50,000 budget for landscape construction. The average staff size is 17.5, with number of personnel ranging from 1 to 175. "Our staff has been reduced to one-half its original size in 1975 through the attrition process. But the areas of responsibility and maintenance have increased," said one respondent. Another respondent said with the tight money situation, he will be feeling the effects for a "few more years, at least."

One park superintendent said his 1983-84 budget plan of attack will be greater use of chemicals, large mowing equipment, specialists, park planning, maintenance management, low-maintenance turf and computer use.

The majority of respondents were in supervisory positions and involved in municipal government landscape management of, on the average, 1,020 acres (50 under some form of irrigation). Those answering the survey came from a broad range of city, state, county and military landscape management, including school superintendents, grounds foremen, crew chiefs, park rangers, gardeners, airport managers and entomologists.

Athletic fields, outdoor maintenance of buildings and park maintenance ranked among the most important areas of care for the respondents. Least important were military installations, cemeteries, golf courses, street and airport maintenance.

The most common type of machinery owned by managers were tractors, small push mowers, chain saws, large riding mowers, dump trucks, string trimmers and fertilizer chemical spreaders.

Most contract out tree trimming and plant and landscape installation...

Repairs are most frequently done by state, county or city service departments or city mechanics. Many repairs are done by the equipment operator.

A resounding majority of those who answered the questionnaire were responsible for purchasing chemicals, seed and equipment for their agency or division, usually under bid. Most budget planning is done in February and March.

Fertilizers were the most frequently used chemical by a majority of the respondents, followed by herbicides for turf weed control and herbicides for total vegetation control. Few used growth regulators or wetting agents.

Trade magazines, publications and journals provide the primary source of information for new seed varieties, chemicals and equipment. Company sales reps, seminars and advertisments are...
KNOWING QUALITY TURF ISN'T ENOUGH.
TODAY'S TURF MANAGER HAS TO MANAGE MONEY, TOO.

Growing rich, green turf in today's economy is akin to being between a rock and a hard place. Most Kentucky bluegrasses demand their fair share of nitrogen and water. But nitrogen and water, like the time needed to apply them, are money. And money is tight.

Fortunately, Rugby Kentucky Bluegrass is not like most bluegrasses. It's designed to get by on less.

In test plots grown in diverse climates from Manitoba to Oklahoma and California to Virginia, Rugby demonstrated superior environmental tolerance means extra vigor in resisting disease.

In overall tests, Rugby scored above 29 other Kentucky bluegrasses in resistance to *Fusarium blight*, and was second highest in resistance to leafspot. It has also shown good ability to avoid the perils of powdery mildew, dollar spot, and stem rust. And if there's anything that can chew your budget to bits, it's the unplanned purchase of fungicide for sick grass.

So the next time you're sitting down with the books, don't get lost in all the worry of red and black ink. Instead, think of the rich, green density of Rugby Kentucky Bluegrass. And how its low-maintenance features can help you out of a tight spot.

For more information, write: Rugby, P.O. Box 923, Minneapolis, Minnesota 55440.
Regularly-Used Chemicals

1. Fertilizers
2. Herbicides for turf weed control
3. Herbicides for total vegetation control
4. Tree Insecticides
5. Fungicides

Also used to decide a maintenance program as well as purchases.

Most contract out tree trimming and plant and landscape installation as well as tree removal, grading, asphalt repair, ballfield dugouts, snow removal and tree moving.

Most landscape managers agreed the property they managed is in passable shape for its use and felt that major improvement in public landscaping would be a hard issue to sell to voters.

An almost equal split of respondents thought a degree was necessary to perform the duties of government landscape manager, while the other half thought it was unnecessary. Some of their thoughts:

"We normally have too many other duties beside the care of the land. The persons hired by our school district learn from trial and error or from a salesman. We normally pay too low to hire professional employees."

"It (degree) would be helpful to some degree, but my duties are so varied, the degree would be of limited benefit."

"A degree requirement may eliminate well-qualified non-degreed persons. But extensive knowledge is definitely needed for quality results."

"This is a highly competitive and technical profession. Our entry-level positions require only a high school education, but almost all our entry level staff have degrees. A degree specifically in horticulture or business is not necessary, however, but they should be the two of the most useful disciplines to be considered."

And on the other side of the coin:

"You deal with so many people from all walks of life you must know the material and be a good business executive as well."

"The ideal person is one with a degree AND experience."
In the plant... For the plant...

C·I·L Sulphur Coated Urea is a high quality, controlled release nitrogen fertilizer that meets the needs of the blender precisely. Custom-sized, uniform particles reduce the chance of your mix segregating and help produce blended fertilizers that stay blended through shipping and application. Your customer is therefore assured of a consistent, top quality product that will suit his application needs.

Controlled, primarily moisture-released action; consistent particle size: with C·I·L Sulphur Coated Urea they add up to continuous, balanced feeding for up to five months per application! For the turf care pro, C·I·L S.C.U. offers easy application, even, long-term growth and superior fertilizer efficiency. C·I·L S.C.U. starts working from the moment it's applied, gives more complete utilization of nitrogen with NO nitrate buildup in the soil — and the sulphur is used by the plants when oxidized!

Whether you blend it or apply it — ask for C·I·L Sulphur Coated Urea: efficient, effective, economical nitrogen!

Wherever professionals grow turfgrass...

C·I·L Inc.
P.O. Box 5201
London, Ontario,
Canada
N6A 4L6

Circle No. 109 on Reader Inquiry Card
Salem Enlists Neighborhoods To Keep Park Budget in Line

Nineteen neighborhood groups help plant ivy in medians, pull weeds by hand, pick up litter, and plant trees.

Frank Bellinghausen, parks superintendent for the City of Salem.

Dealing with cutbacks is part of life for Frank Bellinghausen. With a budget that has continually weathered cut after cut and a staff reduction of from 68 permanent employees six years ago to 45, the parks superintendent for the city of Salem, OR, was running out of ways to keep the quality of services he provided at an acceptable level.

One of the ways he decided to stem the tide of his ebbing budget, Bellinghausen's department became involved in the city's Self Help Project. The Project lets neighborhood groups get involved in the work of keeping their neighborhood in good shape. It saves the city time and some expense and offers the residents a quicker way of getting things done in their particular neighborhood.

This summer, Bellinghausen had three projects under way with four completed. Residents help with planting ivy in medians, hand weed pulling, planting trees and litter pick-up. Salem has 19 neighborhood associations.

"It has its problems, but it works," said Bellinghausen who endorses the project enthusiastically. "We live within the resources we have and where we can, we seek non-governmental support. We're reaching more and more to the volunteer aspect."

After a neighborhood's proposal is accepted by city council, the city provides the funds and the neighborhood provides the labor.

Working with and within a combined city and county $1,900,000 parks' budget consumes much of Bellinghausen's time. (Another $100,000 to $200,000 is budgeted for construction.) He admits budget bureaucracy can be time consuming and tiresome. All budgeting is done through the city's budget.

Tree trimming and shredding in one of Salem's many city parks.
committee, composed of 9 city council members and an equal number of citizens. “There’s a lot of red tape,” Bellinghausen said. “I have to go through three budget committee hearings a year.”

The department’s greatest task is maintaining the turf and trees. In 1979, the department cared for 976 acres. This year that acreage has climbed to 1,644.

“We know how to do the work, but the budget curtails us,” Bellinghausen said. “We have had no uniform application of herbicides for the past five years and have no budget for fertilizing in 1983. While the cutbacks continue, the demand and use of the turf in all areas is up. We can’t reduce mowing any further without disturbing play.”

The city has multi-use fields for baseball, softball and soccer and has a four-field softball complex in the middle of the fairgrounds. “When it gets to be state fair time, I have to schedule crews to go in and take down the backstops,” Bellinghausen said.

Even with the cutbacks, Salem has had its share of recognition and awards, including being named Tree City, U.S.A. for the past seven years by the Arbor Foundation (The city of Salem alone has more than 60,000 street trees) and being named an All-American city for municipalities of its size for 1961 and 1983. “The city has done well to promote its parks with the resources it has,” he said.

To make his division more efficient, Bellinghausen contracts out some of the maintenance on the older city parks so that his crew can handle the newer areas. He has developed a “program budgeting system” where the work areas in the city are divided up and cataloged so that an orderly and efficient maintenance schedule can be followed.

The city of Salem has neighborhood “mini-parks” which are usually small plots with play equipment on them. The larger community parks have regulation ball fields and in some cases, tennis courts. Large urban parks such as the Minto-Brown Island Park & Wildlife Refuge, only five minutes from the heart of downtown Salem, has jogging and bike trails and observation areas.

Bellinghausen has a serious erosion problem to deal with along the Willamette River in the refuge and will work with the Army Corps of Engineers to correct it.

“A city worker does edging around the Salem Civic Center.

---

“We are reaching more and more for volunteer help.”

The equipment for the parks and recreation department is rented from a city equipment pool. In some cases, Bellinghausen has found it more cost and time efficient, rather than tying up his rented equipment, to contract out certain work such as mowing and tree trimming.

Manhattan ryegrass is predominant in the city’s older parks. Now, Bellinghausen said, he uses a Derby/Manhattan mix. More than 400 acres are irrigated automatically.

He is also having a reoccurrence of Oak pit scale. “Up until two years ago, we had it under control, then the budget was cut and we couldn’t afford preventive maintenance anymore.”

Bellinghausen has a parks supervisor who is responsible for the maintenance section and who oversees four foremen; and a Foreman II who heads the repair and construction section and also cares for three pools owned by the school district. Nine craftsmen work for him.

“A lot of my job is to pave the way for other people to get their jobs done,” said Bellinghausen, referring to the governmental channels he must go through. But, he says, he is used to it and his past work experience shows it.

Prior to coming to Salem, Bellinghausen worked for 16 years for the State of California Department of Parks and Recreation. He was a park ranger and became the Statewide Ranger Training Coordinator at Asilamar, assisting in training all new park rangers in the state.

Besides working for the Forest Service, he was a State Parks Supervisor and an Area Manager. He has worked in Squaw Valley, Marin County, Samuel Taylor State Park, Point Reyes and was involved in the early stages of the Old Town San Diego State Historical Park renovation. In those 16 years, he made 13 household moves.

“It was just getting to be too much,” he said, “and I wanted to get out of the law enforcement end of it.”

When he came to Salem in 1972, he restructured the Parks Division. One month after he started his new job, he became involved in the Pacific Northwest Park and Recreation Management school.

“My department has managed to meet the day-to-day challenges and avoid suffering too much,” Bellinghausen explained. “We haven’t had to run around and put out ‘brush fires’ because of the support of the community and elected officials.”

WTT
The Commons is a Number One priority area, receiving twice-a-week trimming and daily policing to keep up the Naval Academy's spic 'n span image.

Cusimano Navigates Protocol At U.S. Naval Academy Campus

Former landscaper scrambles to make 4,500 midshipmen, thousands of tourists, and visiting dignitaries feel at home.

By Kevin Cooney, assistant editor

The U.S. Naval Academy in Annapolis, MD., is not only a government reservation, but a university, tourist attraction and an athletic entity, according to Bill Cusimano, grounds maintenance manager. It is foremost a military base and operated like one.

Strolling through the tree-shaded central campus, one would believe this was another well-manicured Ivy League university until you notice the military statues and memorials that dot the landscape. Then come the plebes (freshmen) and midshipmen, strolling smartly along the red brick pathways in their crisp white uniforms.

Down by the harbor, rows of athletic fields line the sea wall while a few yards away the class of '87 clamber over the school fleet of training vessels, learning the basics of navigation and boat handling they will one day use to pilot destroyers, frigates and aircraft carriers through the world's waterways.

Cusimano ran his own general landscaping business for 19 years before he took over turf maintenance chores at the academy in 1978. He said he learned quickly government work means "you have the responsibility, but not the authority" to get the job done on time.

"When I ran my own business, my work crews had the authority to go out and buy the necessary tools to keep the job going. Here, I have to plan sometimes two months ahead to make sure we have what we need.

All equipment and tools at the academy are purchased by the General Services Administration, which determines what to buy based strictly on the lowest bid. "That way you get the cheapest, but not necessarily the best," he said.

Sherman Wallace, Annapolis' pest control foreman, noted that he can, and does, receive specific brands of fertilizers, fungicides and pesticides he requests. But he has to specify why a specific brand is more appropriate than others for individual jobs and meet state, naval and coastal regulators' requirements before he gets what he needs.

Trim areas are mowed with Jacobsen 20-inch rotaries, and the division's Woods rotary mowers handle the big areas towed behind John Deere or Massey-Ferguson tractors.

Jacobsen reel mowers are also in the academy's inventory. Hustler Excel riding rotary mowers round out the campus equipment.

Decentralization is so inherent in the management structure at Annapolis that Cusimano can't estimate his annual budget. Those figures are spread among the payroll, transportation, purchasing, personnel, housing, athletic and several other departments at the academy.

Occasionally, Cusimano will discover an outside contractor doing work on the grounds as he

Continued on page 54
Reaching New Heights

ALCA
LANDSCAPE MANAGEMENT CONFERENCE
NOVEMBER 13, 14, 15, 1983
DENVER, MARRIOTT SOUTHEAST
DENVER, COLORADO

Program Highlights
The following educational programs will be presented by Fails Management Institute, leading university professors and industry professionals.

Management Trends in the Eighties
Why We Do What We Do
Structured Selling Systems
Selling to Different Types of Contractors

Computers and Your Business
Growth Regulators
Weed Control
Manpower Utilization and Productivity
Equipment Use and Purchasing

For further information and registration form please fill out the form below:

YES! Send me information on the ALCA Maintenance Conference.
Name: 
Company: 
Address: 
City: State: Zip: 
Mail to: ALCA, 1750 Old Meadow Road, McLean, VA 22102. (703) 821-8611.

Circle No. 101 on Reader Inquiry Card
BOOKSTORE

790-RECREATION PLANNING AND DESIGN by Seymour M. Gold
A comprehensive look at recreation needs for parks and how they can design the park facility for the community. Book's content can help justify construction and maintenance needs. $39.95

800-THE GOLF COURSE by Geoffrey S. Cornish and Ronald E. Whitten
The first book ever to give the art of golf course design its due. and golf course architects the credit and recognition they deserve. 320 pages and approximately 150 color and black and white photographs. Traces the history and evolution of the golf course, analyzes the great courses, and shows how they were designed and constructed. $35.00

615-TURF MANAGEMENT FOR GOLF COURSES by James B. Beard
Written by an eminent turfgrass researcher, this USGA sponsored manual provides fourteen exercises involved in turfgrass management, course administration, irrigation, equipment and disease and pest control. Fully illustrated. $45.00

625-ADVANCES IN TURFGRASS ENTOMOLOGY edited by H.D. Niemczyk and B.G. Joyner
A complete account of the facts presented at the 1980 Symposium on Turfgrass Insects. 200 photographs, tables and graphs make this volume an indispensable reference for anyone connected with the turfgrass industry or research. $24.95

405-RESIDENTIAL LANDSCAPING I by Theodore D. Walker
Provides an in-depth discussion of the planning, design and construction phases of residential landscaping. Illustrated with the work of professional landscape architects. Covers everything from analyzing the site to constructing the landscape. $22.50

395-LANDSCAPE ARCHITECTURE by John Ormsbee Simonds
A Manual of Site Planning and Design. This long-awaited second edition outlines and analyzes the complete landscape process from site selection to finished project. In simple and clear terms it describes various planning constraints imposed by the forms, forces and features of the natural and built landscape. $34.95

335-LANDSCAPE DESIGN THAT SAVES ENERGY by Anne Simon
Practical guide to landscaping a home or office to reduce space heating needs by as much as 30 percent annually. Contains specific planning strategies for the four major climatic zones of the continental United States. $5.95

655-TURFGRASS: SCIENCE AND CULTURE LABORATORY MANUAL by S.J. Hansen and R. Israelsen
This specially designed manual by leading turf specialists is a comprehensive, organized approach to turfgrass science and care. An easy-to-use textbook presents a complete account of the facts connected with the turfgrass industry or research. $34.95

360-RESIDENTIAL LANDSCAPING II by John Ormsbee Simonds
A Manual of Site Planning and Design. This long-awaited second edition outlines and analyzes the complete landscape process from site selection to finished project. In simple and clear terms it describes various planning constraints imposed by the forms, forces and features of the natural and built landscape. $34.95

355-TURFGRASS: SCIENCE AND CULTURE LABORATORY MANUAL by S.J. Hansen and R. Israelsen
Class tested over many years, this manual provides fourteen exercises which can be easily adapted to your particular course structure. Exercises involve students in vegetative and seed identification, equipment and irrigation system selection and operation, problem solving of typical math problems involved in turfgrass operations and the diagnosis of weeds, diseases, and insect problems. $27.95

101.015-ADVANCES IN TURFGRASS PATHOLOGY by Drs. B. G. Joyner and P. Larson
Leading U.S. turf pathologists report on turfgrass diseases. Pythium, brown snow mold, fairy rings, leaf spot of Kentucky Bluegrass in Minnesota. initial and field fungicide screening, turfgrass disease resistance, etc. Contains 150 color and black photographs, tables and graphs. $27.95

655-WEEDS by Walter C. Muenscher
Second edition. Premier text for identification and basic natural history for weeds found in the continental United States and Canada. Ecological data on weed biology combined with excellent keys and plant descriptions makes this an essential reference book. $34.50

405-THE GRAFTERS HANDBOOK by R.J. Garner
Revised and updated fourth edition. The encyclopedia of plant propagation by grafting. Contains information on the chemical control of weeds in orchards, on diseases and on the vegetative propagation of woody plants. $19.95

405-WOODY ORNAMENTALS by Parfya, Joyner, Rinetopch, and Carver
Illustrates plant identification characteristics. Organized in two basic sections: plant identification and plant disorders, this text utilizes 430 color photos, 430 line drawings and 45 black and white photos to simplify identification. Goes into detail on plant identification and description as well as plant problems such as diseases, chemicals, insects, and physiological disorders. $27.00

645-MANAGEMENT OF TURFGRASS DISEASES by J.M. Vargas
A comprehensive look at recreational needs for parks and how they can design the park facility for the community. Book's content can help justify construction and maintenance needs. $39.95

665-ADVANCES IN TURFGRASS ENTOMOLOGY edited by H.D. Niemczyk and B.G. Joyner
A complete account of the facts presented at the 1980 Symposium on Turfgrass Insects. 200 photographs, tables and graphs make this volume an indispensable reference for anyone connected with the turfgrass industry or research. $24.95

50 WEEDS TREES & TURF/OCTOBER 1983
Inquiries serviced for 90 days from date of issue. For those countries outside the U.S., please apply appropriate postage before mailing.

**READER SERVICE INFORMATION CARD 10-83**

For more information on products or services mentioned in this issue, circle the corresponding numbers below, fill in appropriate information and mail today.

<table>
<thead>
<tr>
<th>101</th>
<th>108</th>
<th>115</th>
<th>122</th>
<th>129</th>
<th>136</th>
<th>143</th>
<th>150</th>
<th>157</th>
<th>164</th>
<th>171</th>
<th>178</th>
<th>185</th>
<th>192</th>
<th>199</th>
<th>206</th>
<th>213</th>
<th>220</th>
<th>227</th>
<th>234</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>109</td>
<td>116</td>
<td>123</td>
<td>130</td>
<td>137</td>
<td>144</td>
<td>151</td>
<td>158</td>
<td>165</td>
<td>172</td>
<td>179</td>
<td>186</td>
<td>193</td>
<td>200</td>
<td>207</td>
<td>214</td>
<td>221</td>
<td>228</td>
<td>235</td>
</tr>
<tr>
<td>103</td>
<td>110</td>
<td>117</td>
<td>124</td>
<td>131</td>
<td>138</td>
<td>145</td>
<td>152</td>
<td>159</td>
<td>166</td>
<td>173</td>
<td>180</td>
<td>187</td>
<td>194</td>
<td>201</td>
<td>208</td>
<td>215</td>
<td>222</td>
<td>229</td>
<td>236</td>
</tr>
<tr>
<td>104</td>
<td>111</td>
<td>118</td>
<td>125</td>
<td>132</td>
<td>139</td>
<td>146</td>
<td>153</td>
<td>160</td>
<td>167</td>
<td>174</td>
<td>181</td>
<td>188</td>
<td>195</td>
<td>202</td>
<td>209</td>
<td>216</td>
<td>223</td>
<td>230</td>
<td>237</td>
</tr>
<tr>
<td>105</td>
<td>112</td>
<td>119</td>
<td>126</td>
<td>133</td>
<td>140</td>
<td>147</td>
<td>154</td>
<td>161</td>
<td>168</td>
<td>175</td>
<td>182</td>
<td>189</td>
<td>196</td>
<td>203</td>
<td>210</td>
<td>217</td>
<td>224</td>
<td>231</td>
<td>238</td>
</tr>
<tr>
<td>106</td>
<td>113</td>
<td>120</td>
<td>127</td>
<td>134</td>
<td>141</td>
<td>148</td>
<td>155</td>
<td>162</td>
<td>169</td>
<td>176</td>
<td>183</td>
<td>190</td>
<td>197</td>
<td>204</td>
<td>211</td>
<td>218</td>
<td>225</td>
<td>232</td>
<td>239</td>
</tr>
<tr>
<td>107</td>
<td>114</td>
<td>121</td>
<td>128</td>
<td>135</td>
<td>142</td>
<td>149</td>
<td>156</td>
<td>163</td>
<td>170</td>
<td>177</td>
<td>184</td>
<td>191</td>
<td>198</td>
<td>205</td>
<td>212</td>
<td>219</td>
<td>226</td>
<td>233</td>
<td>240</td>
</tr>
</tbody>
</table>

**MY PRIMARY BUSINESS AT THIS LOCATION IS:**

(PLEASE CHECK ONE ONLY IN EITHER A, B OR C)

**A. LANDSCAPING/GROUND CARE AT ONE OF THE FOLLOWING TYPES OF FACILITIES:**

- 0005 Golf courses
- 0010 Sport complexes
- 0015 Parks
- 0020 Rights-of-way maintenance for highways, railroads & utilities
- 0025 Schools, colleges & universities
- 0030 Industrial & office parks/plants
- 0045 Condominiums/apartments/housing developments/hotels/resorts
- 0050 Cemeteries/memorial gardens
- 0060 Military installations & prisons
- 0070 Multiple government/municipal facilities
- Other type of facility (please specify)

**B. CONTRACTORS/SERVICE COMPANIES/CONSULTANTS:**

- 0105 Landscape contractors (installation & maintenance)
- 0110 Lawn care service companies
- 0125 Landscape architects
- 0135 Other contractor or service (please specify)

**C. SUPPLIERS:**

- 0205 Sod growers
- 0210 Dealers, Distributors
- Other supplier (please specify)

Approximately how many acres of vegetation do you maintain or manage?

What is your title? (please specify)

---

**YOUR NAME**

**BUSINESS NAME**

**BUSINESS ADDRESS**

**CITY**  **STATE**  **ZIP**  **TELEPHONE**

**AREA CODE**

**I WISH TO RECEIVE (CONTINUE RECEIVING) WEEDS, TREES & TURF EACH MONTH □ YES □ NO**

**SIGNATURE**

**DATE**
Outside Contractors install new sod after raising the crown of one of the academy's intramural fields.

does his inspection rounds. Virtually all new plantings are handled through outside contracts. The Contracts Division will have arranged for the work, and because of the complex management structure and independence bred into the system, he said communication problems are a constant consideration.

Cusimano's equipment is bought through the GSA. The Ford, Chevrolet and Chrysler vehicles are allocated by the transportation division, and other tools are repaired by the mechanic's division. But irrigation equipment is repaired by the plumbing division.

"The biggest part of my job is salesman and diplomat, trying to convince the other departments that my job needs to be done first," he said.

In addition to the hodgepodge of offices he deals with on equipment matters, Cusimano's crews maintain everything from the garden at the superintendent's ceremonial quarters to apartment complexes, single-family homes, greenhouses, football and soccer fields, areas surrounding radio transmission towers and the academy burial grounds.

Visiting heads of state are entertained at the superintendent's quarters, sometimes on a moment's notice. The landscape there always has to be in top condition. The basement of the stately building houses a flower room where staffers can cut and arrange table decorations within hours of receiving word that a formal event will take place.

Officers, instructors and their families are housed in garden apartment complexes and single-family homes. There's the academy medical center and the cemetery where Annapolis graduates are entitled to be interred. Then, of course, come the classrooms and laboratory buildings, including one area where Japanese pear trees were planted on the roof of an underground laboratory.

"That presents a unique management problem," Cusimano said of the Japanese Pears. No irrigation system was installed to service the dozens of trees located on a concrete mall, and a wind shear coming from the bay through a tunnel created by two buildings means that planting has to be continually monitored to prevent any long-term damage.

Every one of the 4,500 midshipmen at Annapolis is required to engage in one sport during their four years. Every day at about 3:30, "the thundering herd," as Cusimano calls them, invade the 60 acres of intramural and practice fields near the waterfront. Because of rigid time schedules built into a military establishment, he has to adjust his maintenance schedules around the needs of the academic, athletic and military arms of the academy.

One Monday morning his staff overseeded the academy's parade grounds, the foreman said, and by Friday two practice sessions were held on the fledgling turf.

The "military lives by the clock—that's the tradition around here." When it comes to maintaining the athletic areas along the waterfront, soil characteristics present a special problem—those fields were built on top of land reclaimed from the Annapolis Harbor, "and it changes every ten feet—you might have some seabed, then construction fill that came from inland—it makes soil testing almost ludicrous," he commented.

This year Cusimano overseeded those athletic fields with a mix of 10 percent Cheri bluegrass and 90 percent Olympic tall fescue with good results. The non-athletic areas received a 30:30:30 mix of Pennant, Premier and Citation perennial ryegrasses with 10 percent Cheri.

Although he called the Annapolis area "the worst place in the world to grow grass—" it's located in the heart of the transition zone—Cusimano said he's pleased with the results of the overseeding and said the turf is in generally good shape throughout the academy.

Cusimano also instituted a full Par-Ex IBDU fertilizer program this year, but due to a month-long drought in July, he said it's going
Simple, Dependable, Foolproof.

Introducing the MC-3S Satellite Controller System from Rain Bird.

Based on two of the industry's most reliable controllers ever — the Rain Bird RC-1230 and RC-1260 — our MC-3S system combines flexibility and economy like never before. The best of both worlds.

It starts with three Turf Irrigation Start Clocks, with seven-day calendars and 1/2 hour starts. Add an RC-1260 type controller module that provides syringe times of 0 to 10 minutes. Next, up to 75 — that's right, 75 satellites, each one capable of handling up to 12 separate stations from greens to fairways to roughs.

The MC-3S system doesn't stop there, though. You'll also find plenty of Rain Bird extras to help make your job just a little bit easier. Extras like a digital clock that shows time of day. A flashing, loss-of-power display. Satellite pump starts. Manual override switches for each of three satellite groups. Pedestal mount flexibility.

It's a satellite controller system that gets the job done fast and effectively.

For complete information see your Rain Bird dealer, or write: Rain Bird Sales, Inc. • Turf Division, 145 North Grand Avenue, Glendora, California 91740.
to be hard to judge the success of the program when he lays down fertilizer in late spring and mid-November.

To maintain the sprawling academy grounds efficiently with the staff of 70 full-time employees, Cusimano has five separate rating systems. Top priority are high-visibility areas, which are cut twice a week and policed daily. Number five areas, such as around the transmission tower complex and fuel storage tanks, receive occassional attention to minimize weeds and fire hazards.

The athletic areas are in a category by themselves and are maintained according to the needs of the various coaches and athletic department heads who use them. When it comes to chemical control of weeds, insects and fungi, Cusimano said he and Wallace, "go by bloom" when they schedule their pest applications.

"You can never schedule by the calender here," Cusimano said. "You get 100 degree days in April and snow flurries in May."

Wallace said he uses Roundup around the athletic areas, such as on the tartan racing tracks and under bleachers, as well as in all perennial areas throughout the 330-acre complex. He also applies it on the red brick walkways that wind through sections of the campus, as it doesn't stain the old brick as other non-selectives might.

To control white clover on the athletic fields, Wallace applies MCPP, and ornamental lawns are treated with non-volatile 2,4-D.

Dalapon is used for top burning on the waterfront areas, beneath bleachers and in combination with Simazine along fenceline. Orthene is the main insecticide used on the academy grounds, and Wallace said he applies Sevin for leaf chewers.

By combining post- and pre-emergents for fenceline control, Cusimano said his crews can treat those areas twice a year instead of four or five times as they did in the past.

Like many areas on the Eastern Seaboard, Annapolis is afflicted with Dutch Elm Disease. When an infestation is noted, Wallace's crews inject cups of Bidrin around the trunk. "That shoots up to the leaves in a matter of hours," and quickly kills off that particular infestation, Cusimano said.

"It's a big problem, but we're holding the line" by using Arbotect 20S in a preventative program, Wallace commented.

Forty-five hundred cadets, their families, VIPs and almost-three million tourists visit Annapolis each year. There isn't any land bank for rotating use of the athletic fields, and new construction projects are always on the drawing board at the Naval Academy. By keeping on top of the myriad regulations, customers and departments at Annapolis, Cusimano keeps Annapolis both an institution and attraction.
WE REACH THE PEOPLE 
YOU NEED TO REACH!

Place a classified ad in any of these HARCOURT BRACE JOVANOVICH PUBLICATIONS - and you know your ad dollar is wisely spent.

HBJ PUBLICATIONS does a better job of reaching those who count (your potential customers) than any other business publisher.

Don’t forget that classified advertising works just as effectively in locating employees as it does if you are looking for a position, have a line, machinery or a business to sell, are seeking representatives or wish to buy a specific item. Let it go to work for you!

HBJ PUBLICATIONS - 
COUNT ON US TO REACH 
THOSE WHO COUNT!

HBJ HARCOURT BRACE JOVANOVICH PUBLICATIONS
One East First Street
Duluth, Minnesota 55802

Call Dawn Anderson at 218-727-8511
WE GIVE GREENS THE KINDEST CUT OF ALL.

WITH REELS THAT FLOT.

Toro pulls out the stops to give you the kind of greensmower you want most.

One that keeps you cutting. With a quality of cut second to none.

That's why our Greensmaster 3® is the choice of the majority of America's top hundred golf courses.

This fast, agile professional gives each green a uniform cutting height, appearance and playing characteristic.

low pullpoints, that pulls rather than pushes. Resulting in balanced, fully floating cutting heads that allow the reels to float freely as they cut, unaffected by dips or bumps encountered by other parts of the machine. Or by the weight of clippings in the baskets.

You get the kindest cut of all. Smooth. Even. Consistently superb.

Plus, other features that make the Greensmaster 3 a versatile as well as durable performer. Like quick disconnect cutting heads for easy conversion to thatching or spiking units.

Call your Toro distributor. He'll give you more good reasons to choose our Greensmaster 3. The greensmower that proves Toro quality doesn't cost, but pays.

"Toro" is a registered trademark of The Toro Company
8111 Lyndale Ave. So., Minneapolis, Minnesota 55420.
Make your mower a marshmallow

Protect your trees from front-end mowers. Reducing mower-inflicted damage to trees, especially young specimens, is a continuing concern for grounds superintendents and horticulturists. While much research has been devoted to observing how a tree heals after wounding and applying preventative measures to the tree itself, an old tire and a couple of tools can turn your trunk-chopping mower into a marshmallow — almost.

Remove the side walls from an old, non-radial car or truck tire. Lay the inside of the tread against the steel guard of your mower that protects the cutting blades and drill 1/4-inch holes through the rubber and guards. But before drilling, be sure to position the holes above or below the cutting plane of the blades. Otherwise the bolt heads may hit the blades and ruin their edge.

Don’t forget to place strips on the sides of your cutting guard too, as it doesn’t always take a head-on collision to place a good gouge on the tree trunk.

Insert a bolt with the rounded head on the inside of the steel guard and attach the appropriate washers and screws. After tightening down the nut, cut off any excess bolt that protrudes beyond the nut and shave the end smooth.

To cover the nut, use epoxy glue - it can be purchased in ribbon-like form. After kneading the ribbon, you’ll end up with a ball of putty-like material. Apply generously, and after hardening it will provide a durable shield between the bolt and tree trunks.

Don’t forget to place strips on the sides of your cutting guard too, as it doesn’t always take a head-on collision to place a good gouge on the trunk.

A quick coat of paint to match your mower, and your staff is ready to tackle those tight areas around trees with relative impunity.

Then let us know.

This publication will be mailed only to your current business address. Please indicate changes and return this coupon to us along with the mailing label attached to the magazine cover to avoid duplication. Thank you.

Send to:
WEEDS TREES & TURF
HARCOURT BRACE JOVANOVICH PUBLICATIONS
Subscription Dept.
1 East First Street, Duluth, MN 55802

Signature

PLEASE PRINT

Name
Business Name
Business Address
City State Zip
Phone Date

OCTOBER 1983/WEEDS TREES & TURF 59


Greenhouse & Landscape Maintenance Conference, Salt Lake City Travelodge. Nov. 15-17. Contact Dr. Dallas L. Holmes, Utah State University, UMC 50A, Logan, UT. 84322.

9th Annual Professional Landscape Management School, Indiana State University, Evansville, Nov. 15-16. Contact Allen Bober, Extension Agent, Horticulture Room 202, City-County Building, Evansville, IN, 47708.

Basic Personnel Management For the First Level Supervisor, sponsored by the Free State Branch, Professional Grounds Management Society. Nov. 16, Turf Valley Country Club, Ellicott City, MD. Contact Jeffrey A. Bourne, Howard County Recreation and Parks, 3430 Court House Drive, Ellicott City, Maryland, 21043. (301) 997-0714.

Arbor Expo, Philadelphia Civic Center, Nov. 17-19. Contact Daryl Komar, 17 Washington St., Norwalk, CT 06854. (203) 852-0500.


Ohio Turfgrass Conference & Show, Cincinnati Convention & Exposition Center. Dec. 6-8. Contact John Street, OTF, 2021 Coffey Rd., Columbus, OH 43210. (614) 422-2601.

To insure that your event is included, please forward it, 90 days in advance, to: WEEDS TREES & TURF Events, 7500 Old Oak Boulevard, Cleveland, OH 44130.
Ford unveils five new compact loaders

Five new compact Load Handlers are available from Ford that include diesel power, four-wheel hydrostatic drive and foot controls for the hydraulic-operated buckets. Ranging from Class II (700-900 lb. lift capacity) to Class V (more than 1,750 lb. lift cap.), the new models and their classes are: The CL-25 (Class II) with 800-lb. rating and 20 HP engine, the CL-35 (Class III) with 1,000-lb. rating and 28-HP engine, the CL-45 (Class IV) with 1,300-lb. rating and 33 HP engine, the CL-55 (Class IV) with 1,700 lb. rating and 43-HP engine and the CL-65 (Class V) with 2,000-lb. rating and 62-HP engine. The CL-25 and CL-35 are also available with gasoline engines on special order.

Poast labeled for non-food crops

The EPA has given Poast post-emergent herbicide additional labeling to control grassy weeds in ornamentals, nursery stock and other non-food crops including Christmas trees. The BASF Wyandotte Corp. product can now be used to control annual and perennial grasses in azaleas, cotoneaster, flowering dogwood, euonymus, Frasier fir, forsythia, holly, juniper, Southern magnolia, red maple, willow oak, periwinkle, Eastern white pine, lobolly pine, mugho pine, Virginia pine, poplar, Norway spruce, white spruce and other plants. The herbicide enters

Pressure compensated bubblers by Rain Bird

Low flow rates of .25, .50 and 1.00 gpm can now be maintained despite water pressure changes with the 1400 series Pressure Compensating Bubblers available from Rain Bird of Glendora, CA. The bubblers are designed for localized irrigation of trees, shrubs and other small areas where precise watering is needed. The low flow rates and conventional installation features allow the bubbler to be used in many areas that were suited only for drip systems before.

MILORGANITE on dormant turf provides nutrients when they are needed

Apply MILORGANITE in early winter to get early green-up in the spring. Golf courses have done this for 50 years.

Milorganite 

Ask Your Grass!

Just ask your grass what it thinks of the nutrients MILORGANITE provides for dormant turf. Do it just before the heavy snow falls.

CAUTION

The following statements apply only to MILORGANITE. Other materials may produce excessive early growth or induce unwanted growth during winter thaws.

Milorganize in early winter like the golf courses do:

- Promote early spring green-up.
- Eliminate early spring feeding.
- Save money (off season order)
- Keep nutrients in place.

Milorganite is non-leaching.
Scientific Guide To Pest Control Operations

by Dr. L.C. Truman
Dr. G.W. Bennett and
Dr. W.L. Butts

Domestic: $32.50* (hardcover)
Foreign $37.50* (hardcover)

The SCIENTIFIC GUIDE TO PEST CONTROL OPERATIONS is designed to provide a sound basis for studying the scientific aspects of pest control and promote technical competence. It places emphasis on urban and industrial pest problems. This volume also covers the laws and regulations concerning the pest control industry.

The SCIENTIFIC GUIDE TO PEST CONTROL OPERATIONS is written for owners, supervisors, servicemen, salesmen, students, persons preparing for state certification under the EPA/state programs for commercial pesticide applicators, and people interested in structural pest control.

The SCIENTIFIC GUIDE TO PEST CONTROL OPERATIONS - a must for anyone involved in the field of pest control!

Return this coupon to: Book Sales
Harcourt Brace Jovanovich Publications
One East First Street, Duluth, MN 55802

YES! Please send me_ copy(ies) of the SCIENTIFIC GUIDE TO PEST CONTROL OPERATIONS.

A check or money order for_ is enclosed.

Please charge to my Visa, Master Card, or American Express (circle one)

Quantity rates available upon request.

Ordering Information

Name (print)
Address
City State Zip
Phone

Signature
Send to: Book Sales
Harcourt Brace Jovanovich Publications
One East First Street
Duluth, MN 55802

WTT 103

Please allow 6-8 weeks for delivery.

TURF MANAGERS’ HANDBOOK

By Dr. William Daniel and Dr. Ray Freeborg

$23.95* hardcover $18.95* paperback

This essential reference book covers:
• scope and organization • pests and controls
• grasses and grooming • uses of turf
• rootzones and water • serving turf needs
• nutrition • AND MORE

The TURF MANAGERS’ HANDBOOK is an easy on-the-job reference to planning, purchasing, hiring, construction, and plant selection. These 424 pages contain 150 illustrations, 96 color photographs plus 240 tables and forms.

Focus In On Turf
in Rochester, New York
November 1-3, 1983

NY State Turfgrass Association
• EDUCATIONAL CONFERENCE
• EXPANDED TRADE SHOW
• SPECIAL WORKSHOPS

For further information please contact
NY State Turfgrass Association
210 Cartwright Boulevard
Massapequa Park, New York 11762
(516) 541-6902

62 WEEDS TREES & TURF/OCTOBER 1983
The new Woods Models 650 and 750 utility backhoes can outperform others their size (and larger) digging footings, irrigation ditches, drainage ditches, wiring trenches, and for landscaping.

They offer control ... and safety. Two lever control of all functions: reaching, digging, lifting, swinging and dumping. It couldn't be easier. And Woods' exclusive "Saf-T-Lok®" mount which eliminates side-to-side free-play movement of the 3-point hitch, their wide stance cantilevered stabilizers, and their self-contained independent hydraulics make sure they go where they're put ... and stay put. Woods' 162° bucket curl gives maximum breakout and full "bite", keeps material in the bucket, and tucks away for safe convenient transport between jobs. The operator platform, with adjustable seat, puts him where he can see his work, and perform safely and comfortably.

And they give a choice. Model 650 reaches 7'10" and will dig 6'6" deep from tractors rated 18-35 hp with standard category 1, 3-point hitch. Model 750 reaches out 9'4" and down 7'6" from 20-40 hp tractors.

Get the "full scoop" on these top performers today. Send for complete specifications.
Designed for center-mounting, the dual trim deck discharges at the rear with a 9.5-inch offset on both sides and has a low-profile design to reach under benches and other low obstacles. The deck features three 24-inch lift blades that counter-rotate to eliminate the windrowing effect. Cutting height adjustments from 1 to 5 inches can be made in quarter-inch increments using front-gauge wheels. The rear of the deck is also easily adjustable to ensure a level cut.

Circle No. 153 on Reader Inquiry Card

Embark PGA
label expanded

3M's Embark Plant Growth regulator is now approved for use on a wider range of ornamentals for control of Poa Annua seedhead development and spraying grasses around agricultural premises following EPA approval. Japanese ligustrum, pyracantha, English ivy and holly now can be treated with Embark, as well as 14 additional ornamentals in California. On golf course fairways, the herbicide can be applied at a 1/2 pint per-acre rate for control of Poa annua seedheads which strengthens root systems and enhances summer color and vigor.

Circle No. 154 on Reader Inquiry Card

New gearbox replaces Toro 690

The full-circle Model 10114 Gearbox from Royal Coach/Buckner is a two-nozzle impact drive sprinkler to replace the Toro 690 gearbox. An adjustable breakup pin on the drive nozzle reduces dry spots close to the head, while seven nozzle sizes with different volume and coverage patterns are available for special jobs. The 10114 has few moving parts and is made of heavy-duty bronze for long wear.

Circle No. 155 on Reader Inquiry Card

Marvik Aquaflow for ornamental pests

A new synthetic pyrethroid labeled to control aphids, thrips, whiteflies and leaf-eating caterpillars is available from Zoecon Corp. Marvik Aquaflow has been labeled for use on indoor and outdoor non-food ornamental crops and plantings, and shows good suppression of mites at the highest label rate. Applied as a full-coverage foliar spray, the water-based formulation should be used according to the severity of pest pressure or damage potential. Zoecon Products Manager Jim Heath said Marvik Aquaflow does not cause the mite flare problems other pyrethroids have shown because it does not affect most predators.

Circle No. 156 on Reader Inquiry Card

Why Their Grass Is Always Greener

Instant Spring by Wellborn is a water-based color coating that keeps your grass greener and healthier year-round. Instant Spring concentrate provides nutrients for growth, and its deep green color promotes greater absorption of sunlight for increased life of the grass and reduced danger of freezing. Wellborn is a leader in paint chemistry and will provide you with complete technical assistance. Please write or call us for more information.

George Leavitt
Wellborn Paint Manufacturing Company
Post Office Box 25645
Albuquerque
New Mexico 87125
(505) 344-3558

Circle No. 133 on Reader Inquiry Card

We Made It Simple!

• QUALITY — Built with Swiss clocklike precision.
• LIGHTWEIGHT — With the comfort of the user in mind.
• ACCESSIBLE — A durable self-lubricating and external pump assembly.
• SIMPLICITY — Ensures cleanliness and longer wear. No tools necessary to dissemble and repair.
• PRICING — Here's one instance where you pay less for the best.

BIRCHMEIER has the
Back Pack
Sprayer for you —

5 GAL. (20 K)
ALSO AVAILABLE IN
2½ GAL. (10 K)
3½ GAL. (15 K)

FOR MORE INFORMATION
TREBOR CORPORATION
4047-A JONESBORO ROAD • FOREST PARK, GA. 30090 • 404-366-0957

Circle No. 131 on Reader Inquiry Card

Instant Spring by Wellborn is a water-based color coating that keeps your grass greener and healthier year-round. Instant Spring concentrate provides nutrients for growth, and its deep green color promotes greater absorption of sunlight for increased life of the grass and reduced danger of freezing. Wellborn is a leader in paint chemistry and will provide you with complete technical assistance. Please write or call us for more information.

George Leavitt
Wellborn Paint Manufacturing Company
Post Office Box 25645
Albuquerque
New Mexico 87125
(505) 344-3558

Circle No. 133 on Reader Inquiry Card
Protect your reputation
Know these facts before you buy fertilizer

Fact: Country Club and Greenskeeper fertilizers are of the highest quality homogenous grades made today.

With over 35 years of extensive university and proven end-use testing, the dependability of our product is clear. Each agronomically balanced pellet contains all three essential plant food elements—N, P, K, regardless of the material’s sizing and coverage. This alleviates the possibility of certain elements sitting to the bottom of the spreader or particles being too large to pass through the opening. Our products are smooth flowing, non-binding and dustless, and specifically formulated with analysis for these end uses:

GREENS and BENTGRASS TEES: SIZING FINE
Country Club 18-4-10 90% Org. Sulfate-Minors
20-0-10 50% Org. Sulfate-Minors

FAIRWAYS and TEES: SIZING MEDIUM
Professional Lawn Applicators
Turf Managers
Country Club 18-5-9 50% Org. Sulfate-Minors
20-0-10 50% Org. Muriate-Minors
20-2-16 30% Org. Muriate-Minors

Greenskeeper 20-8-8 50% Org. Muriate-Minors
20-4-10 40% Org. Muriate-Minors

Granular Control Products
Tupersan® Treflan® Daclhal® Dacthal®
Daconil® Benzimidazol® Thiram/Cadmium

Fact: Lebanon Chemical has the flexibility to insure you with the right product for your turf needs and within your budget. We are ready to formulate exactly the analysis that will be the most beneficial to you. This includes a complete line of sulfur coated urea blends. A few of our most popular analysis are:

Leb Pro
32-4-8 Muriate Minors
28-6-12 Muriate Minors
27-3-5 Sulfate Minors

If your needs dictate your own label, we are fully equipped to formulate and bag private label products as well. Lebanon Chemical can also supply your chemical needs, and is a major distributor for Monsanto, Rhone-Poulenc, Diamond Shamrock, Ciba Geigy, BFC, Moby, Chevron, Rhom & Haas, Miller, Dow, Union Carbide, DuPont, Stauffer and Elanco.

Fact: Lebanon Chemical is a leader in providing service for you. Our knowledgeable sales representatives are ready to provide you with the information for your needs whether you’re a golf superintendent, turf manager, or a professional lawn applicator. Because of their technical backgrounds, Lebannot sales staff can assist all professionals in solving turf grass problems and aid in the designing of a complete turf care program. Publications outlining detailed specifications on our products and their use are available upon request, along with soil testing, specifically designed to diagnose soil related turf problems. Lebanon’s Customer Service department is always ready to answer your questions and process your orders quickly and efficiently.

And with a solid network of distributors throughout the country, Lebanon can ensure you of immediate service, and offer services such as palletized units and stretch wrapping of shipments.

Lebanon Chemical is setting the standards today for you to grow tomorrow.

Distributor inquiries accepted . . . Call today!

Phone:
East 800-233-0628
Pennsylvania 717-273-1687
Midwest 800-637-2101
Illinois 217-446-0983
RATES: 95 cents per word (minimum charge, $20). Boldface words or words in all capital letters charged at $1.20 per word. Boxed or display ads: $80 per column inch, one time; $76, three times; $75, six times; $70, twelve times. For ads using blind box number, add $5 to total cost of ad. Send ad copy with payment to Dawn Anderson, WEEDS TREES & TURF, 1 East First Street, Duluth, MN 55802.

BOX NUMBER REPLIES: Mail Box number replies to: WEEDS TREES & TURF, Classified Ad Department, 120 W. 2nd St., Duluth, MN 55802. Please include box number in address.

BUSINESS OPPORTUNITIES

WANT TO BUY OR SELL a golf course? Exclusively golf course transactions and appraisals. Ask for our catalog, McKay Golf and Country Club Properties, 15553 N. East Street, Lansing, Michigan 48906. Phone (517) 484-7151. 7/83

CLOSEOUT SPECIAL! Save your back issues of WEEDS TREES & TURF and save money at the same time. We're closing out our line of permanent binders at the special low price of $2 only (This is a $7.00 savings over our regular price plus postage and handling.) Orders will be filled as long as our supply lasts—quantities are limited. Order your binders today from: Book Sales, HBJ PUBLICATIONS, One East First Street, Duluth, MN 55802. TF

FOR SALE

Princeton Sod cutter- $9000.00. Jacobsen Gang Mower, $8500.00. Complete Sod business with sod and equipment. (303) 858-7464. 7/83

GROUNDSMIX—New or old const. Will blend material on job site for you, radius of 700 miles. Large Royer—S.D.I., P.O. Box 2611, Shawnee Mission, Kansas 66201. Phone (913) 382-5151. 7/83

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, OH 44321. Call collect (216) 753-2259.

Sprayers: BEAN D050E - 600 gallon tank, 50 g.p.m. pump, 4 cylinder Wisconsin, May '82. BEAN Royal 20 - 300 gallon tank, 20 g.p.m. pump, 2 cylinder Wisconsin. Call 1-207-985-2567. 11/83

Vermeer tree spade—TS44A trailer mount, like new. (414)248-7053 or (414)248-9395. 10/83

300 acre sod farm. 150 acres ready for market. Started business. Good investment property. Southeast MN. Land contract available to right party. 608-784-6530. 11/83

Used Finn lawn feeder, 800 gal. w/hose, reel & spray gun. $5000.00. (502) 782-2730. 1:00 pm - 4:30 pm. 11/83

NEW TREE FERTILIZATION GUN, tested on over a million square feet of trees and shrubs all over the U.S. Good to 500 psi, repairable, non-corrosive. Buy direct from manufacturer, $89.50 + Shipping. Arbor-Nomics, Inc., 5634-A Buford Highway, Atlanta, Georgia 30071. (404) 447-6057. TF

For Sale - Lindig Soil Shredder Model B-24, $1,200.00. Mits & Merrill Chipper 6 Cylinder Gas, $3,500.00. 66" Vermeer Tree Spade mounted on 1972 Chevy Tandem, $14,900.00. All in good condition. Ready to work. 313-738-2771. 10/83

Northern grown pure Meyer Zoysia (Z-52) your great water and $ saving turf (Row Planting) "Beauty Lawn Zoysia " (Cincinnati) (513) 424-2052. TF

SKYWORKER AERIAL BUCKETS—Sales of both new and used. Finest service anywhere in the country. Overhauls and changeovers are our specialty. Best prices on parts. We deal in all types of tree trimming equipment. Ask about fleet discounts. Call or write American Hydraulics, Inc., Route #4, Hartwell, GA 30643; (404) 376-3191. TF

USED EQUIPMENT

For Sale: 1983 Bean Sprayer, 65 HP Wisconsin, Bean Pump 60 GPM, 1,000 Gallon Stainless Tank, 300' Hose with electric reel, Mint Condition - $12,500 or best offer. 1978 Turf Vac FMS-5 model, 5.5 yard capacity, 16 HP Kohler engine, spare tire, excellent condition - $1,000. Kelly's Landscaping Co. (203) 528-8400. 10/83

Hydraulic cranes, bucket trucks, knuckle boom loaders, crew cab tree trucks, dump chip boxes. Call or write American Hydraulics, Inc., Route #4, Hartwell, GA 30643; (404) 376-3191. TF

Ditch Witch VP-12 Vibratory Plow, C99 Handle Bar, 57 Trailer. All in top condition. David Scott Associates, Kingsport, TN (615) 247-9147. 10/83

NEW and USED EQUIPMENT Hi Ranger and Asplundh Forestry bucket trucks, Asplundh and Chipmore wood chippers, Stump Grinders, Log Splitters, Crane Trucks. Mirk Inc. (216)669-3567, 7629 Chippewa Road, Orrville, Ohio 44667.

HYDRO-MULCHERS AND STRAW BLOWERS New and used. Southwest Hydro-mulchers, 3220 S. Jupiter Rd., Garland, TX. 75041. (214) 840-2440 (Tx.). (800)527-2304(except Tx.). 12/83


HELP WANTED

LANDSCAPE MAINTENANCE MANAGER

Chapel Valley Landscape Company is expanding their commercial landscape maintenance business and has an opportunity for an enthusiastic, quality and service oriented person who has a horticulture maintenance background. Leadership and management abilities are important. Excellent growth opportunity with full company benefits. Send resume to: CHAPEL VALLEY LANDSCAPE COMPANY J. Landon Reeve IV, President Post Office Box 159 Woodbine, Maryland 21797 E O E

General manager position open for both chemical lawn and shrub division of established landscaping company in the sunbelt area. Tremendous opportunity for an aggressive individual having experience with a national or regional lawn care company. We are looking for a BUSINESSMAN—the very BEST! Knowledge of turf grass, ornamental plants, and marketing needed. The right person will enjoy excellent salary, benefits, and opportunity for equity participation with unlimited earnings potential. Send complete resume including education, experience, and salary history. All replies will be kept confidential. Write WTT Box 325.

MANAGER—LANDSCAPE

We have an excellent career opportunity for an experienced landscape manager, primarily in our operations on the West Coast and Sunbelt states. Position involves supervision of 50+ individuals, budget forecasting plus expense control, miscellaneous landscape design work, landscape coordination on new developments and selection, training and motivation of all staff including contractors. We are seeking a business man with a degree in horticulture or a related field. A minimum of 5 years hands-on supervisory/management experience and the ability to handle a challenging and creative position. We offer an excellent salary, company paid medical/life insurance and room to grow.

If you meet our qualifications, and are interested in a rewarding career, please send your resume complete with salary history to:

P.O. Box 64719
Los Angeles, CA 90064

Equal Opportunity Employment—M/F
**Purchasing Agent**

Chapel Valley Landscape Company has an opportunity for a person who is knowledgeable in horticulture, particularly with plants and their use, has good organizational skills, can meet scheduling demands and can develop good relationships with people. Excellent company benefits. Send resume to:

**Chapel Valley Landscape Company**

J. Landon Reeve IV, President
Post Office Box 159
Woodbine, Maryland 21797

---

**Position Wanted**

Chemical Lawn and Tree Manager—Seeks challenging management position for established chemical lawn and tree company in Florida. Six years experience, with extensive knowledge of turf grass, ornamental plants, and marketing. Resume upon request. Write WTT Box 319.

---

**Miscellaneous**

KELWAY® SST, new professional SALINITY TESTER using microchip technology, retails under $90.00. Eliminates soluble salts problems by telling when to leach or fertilize. Available from distributors. Brochure from KEL INSTRUMENTS CO., INC., P.O. Box 1869, Clifton, N.J., 07015, (201) 477-3954.

Attend Arbor Age’s First Annual Conference and Exhibition for the tree care industry, November 17-19, 1983, Philadelphia Civic Center, Philadelphia, PA. Seminar, Free Exhibit Hall, Special Events. Call or write Nancy, Arbor Expo, 17 Washington Street, Norwalk, CT 06854, 203-852-0500 for your free descriptive brochure.

---

**Accountants Wanted**—National chemical lawn care company seeks accounts to acquire. Selling price open for negotiation. If interested, send name, address, phone number and number of accounts available to WTT Box 317.

---

**Position Wanted**

Texas Turf-Grass Association has a position available for a Director of Member Services. Horticultural or agronomic background preferred. Will need to locate in Orlando, Florida area. Position entails developing educational program for the Association, assisting in membership and agronomic activities. Insurance, paid vacation and travel allowance included. Position will be responsible to Board of Directors of FT-GA. Starting salary minimum $28,000 per year negotiable. Send full resume to Florida Turf-Grass Association, 1520 Edgewater Dr., Suite E, Orlando, FL 32804. Tel 305/425-1581.

---

**Landscape Irrigator/Grounds Maintenance - Aggressive young firm in Dallas/Ft. Worth Metroplex has openings for grounds maintenance personnel with a minimum of three (3) years experience in irrigation installation and trouble shooting. Send resume and salary history to Bill James; The Ground Crew, Inc., 3008 Pleasant Valley, Arlington, Texas 76015 (817) 467-5888.

Self-motivated, experienced manager needed for a Landscape Maintenance and Construction firm. Above average abilities in all facets of management required. Excellent Southwest location. Write WTT Box 322.

Manufacturers’ Representatives wanted; many areas in the United States still open. Contact: Donn Holman/Rick Slevin, ROBCO, INC., 975 #D Detroit Ave., Concord, CA 94518... (415) 827-0926.

---


---

DIESEL HI-RANGER TOWERS—48-100 Feet working heights. Daily, weekly, monthly rentals with or without operator. MATLOCK LEASING, Pottstown, PA (215) 326-7711 or (800) 345-7711.

---

**Send a classified advertising message...**

...write here.

(Please Print)

1. Number of insertions: (circle) 1 2 3 6 12 TF (If Forbid)
2. Start with (month) issue (Copy must be in by 25th of two months preceding)
3. Amount enclosed: $______________

TO KEEP OUR RATES AS LOW AS POSSIBLE PAYMENT MUST ACCOMPANY YOUR ORDER.

SIGNATURE ______________ DATE ______________

NAME __________________ COMPANY __________________

STREET __________________

CITY __________________ STATE __________ ZIP __________

PHONE NUMBER __________

MAIL AD COPY TO: Dawn Anderson, WEEDS TREES & TURF, 1 East First Street, Duluth, MN 55802

**RATES:** 95¢ per word (minimum charge $20.00). Boldface words or words in all capital letters charged at $1.20 per word. Boxed or display ads: $80 per column inch, one time, $78, three times; $75, six times; $70, twelve times. For ads using blind box number, add $5 to total cost of ad.
Advances in Turfgrass Pathology

published by HARCOURT BRACE JOVANOVICH PUBLICATIONS in cooperation with Dr. B. G. Joyner, Dr. P. O. Larsen and Chemlawn Corporation

This extensive volume contains chapters on:
- turfgrass diseases
- cool v.s. warm season pythium blight and other related pythium problems
- snow molds of turfgrasses
- fairy rings
- leaf spot of Kentucky Bluegrass in Minnesota
- initial and filed fungicide screening
- turfgrass disease resistance
- PLUS MUCH MORE!

ADVANCES IN TURFGRASS PATHOLOGY is a compilation of more than 23 reports and discussions by the nation's leading turfgrass pathologists. Explore the diseases that attack turfgrass. Find out how to conquer the battle of turfgrass diseases.

KEEP CURRENT WITH NEW IDEAS ON HOW TO HANDLE TURFGRASS PROBLEMS WITH ADVANCES IN TURFGRASS PATHOLOGY.

ADVANCED IN TURFGRASS PATHOLOGY contains more than 23 reports and discussions by the nation's leading turfgrass pathologists. Explore the diseases that attack turfgrass. Find out how to conquer the battle of turfgrass diseases.

ADVANCES IN TURFGRASS PATHOLOGY is a compilation of more than 23 reports and discussions by the nation's leading turfgrass pathologists. Explore the diseases that attack turfgrass. Find out how to conquer the battle of turfgrass diseases.

$27.95* (hardcover)

COPIES LIMITED — DON'T DELAY!

Return this coupon to: Book Sales
Harcourt Brace Jovannovich Publications
One East First Street, Duluth, MN 55802

YES! Please send me ________ copy(ies) of ADVANCES IN TURFGRASS PATHOLOGY.

Name ____________________________
Address ____________________________
City ___________ State ______ Zip ______
Phone ________

$27.95* hardcover
Quantity rates available on request.

A check or money order for ________ is enclosed.

*Please add $3.00 per order plus $1.00 per additional copy for postage and handling.

Please charge to my Visa, Master Card, or American Express (circle one)

Account Number ____________________________
Expiry Date ____________________________

Please allow 6-8 weeks for delivery.

WT 103
FORD 555 DIGS
MORE PER GALLON!

Independent tests prove Ford 555 stretches fuel better than the competitive rigs!

No. 1 in fuel economy!  No. 1 in trenching!

Get a free demonstration!
Find out how Ford 555 digs up to 25 percent more per gallon of fuel than Deere 410! More than Case 580 Super D! More than Massey Ferguson 60!
And there's more! Ford 555 trenched up to 27 percent faster than Deere...and faster than the other competitive rigs against which it was tested.

Your choice of 2 or 4-lever controls provide smooth performance. Optional extendible dipperstick digs over 19 feet deep. Up front, Ford 555 gives you 9,800 pounds of loader breakout force and easy, single-lever control to handle 4,700-pound loads. New Ford 4x4 torque converter power-reversing transmission speeds shuttle operations.

For a free demonstration of the Ford 555 and a summary of the independent test results, call your Ford Tractor dealer today.

The Backhoe-Loader Specialist

FORD TRACTORS

48-month fixed rate financing on all new Ford industrial tractors, tractor loaders, backhoe-loaders and wheel loaders.
Or, delay your payments until April 1, 1984, followed by up to four years of 10½% Fixed Annual Percentage Rate financing.
You must be a qualified buyer and take delivery by November 30, 1983. Certain restrictions apply. See your participating dealer for details.
As Arnold Palmer is a legend of golf, Palmer turf-type perennial ryegrass is a "new generation" ryegrass setting new standards for ryegrass performance. The performance of those varieties popular only a few years ago, is being challenged.

Palmer turf-type perennial ryegrass has a lot to offer in improved ryegrass performance:

- Improved mowability
- Attractive dark green color
- Excellent heat and drought tolerance
- Good winter hardiness
- Resistance to crown rust and brown patch
- Fine-leaved, dense growth habit

Palmer was developed by Lofts Seed Inc. in cooperation with the New Jersey Agricultural Experiment Station at Rutgers University, under the direction of Dr. C.R. Funk. Another improvement through research. Palmer, named for a professional... by the professionals.

Lofts Seed Inc.
Bound Brook, NJ 08805
(201) 356-8700 • (800) 526-3890

Lofts/New England
Arlington, MA 02174
(817) 646-7515

Lofts/New York
Cambridge, NY 12816
(518) 677-8685

Available Fall 1982 Circle No. 115 on Reader Inquiry Card