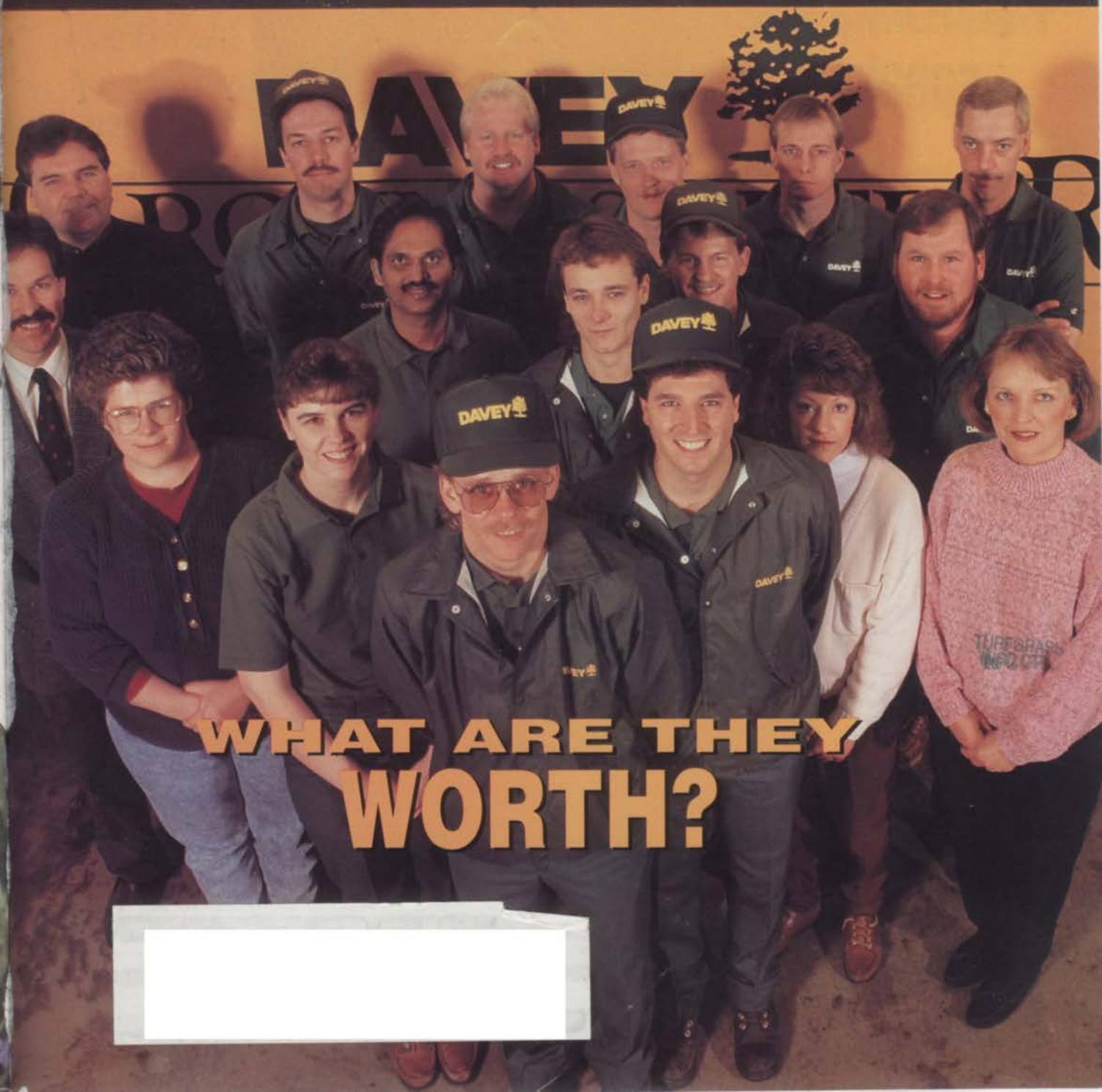


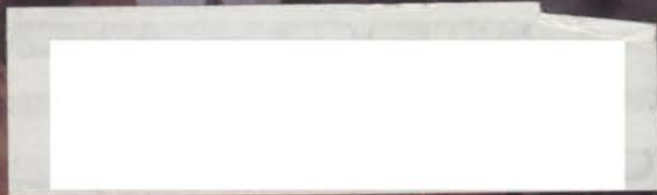
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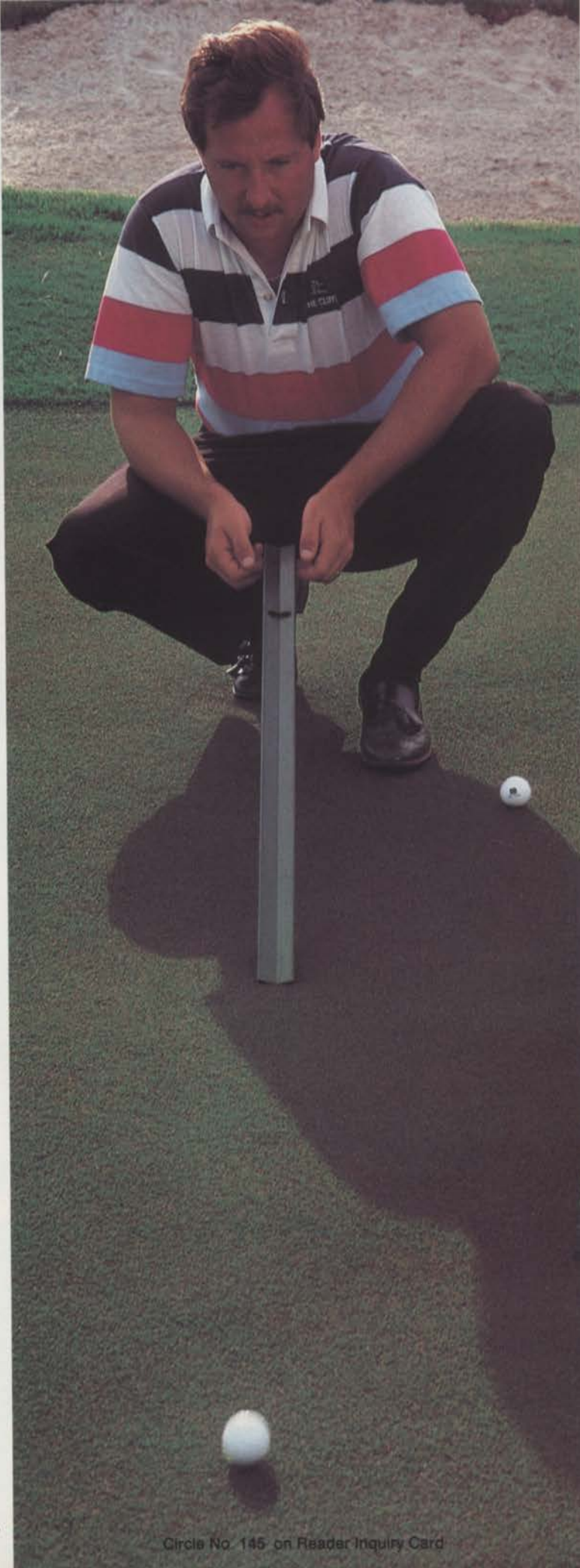


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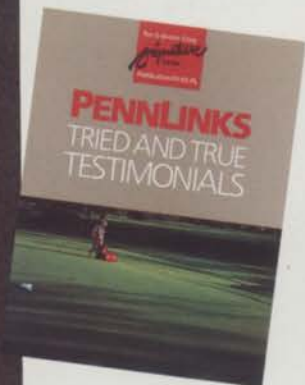


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On the cover: Employees of the Davey Tree Preservation Co., Kent, Ohio. Photo by Wayne Rayburne, Productions, Inc.



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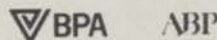


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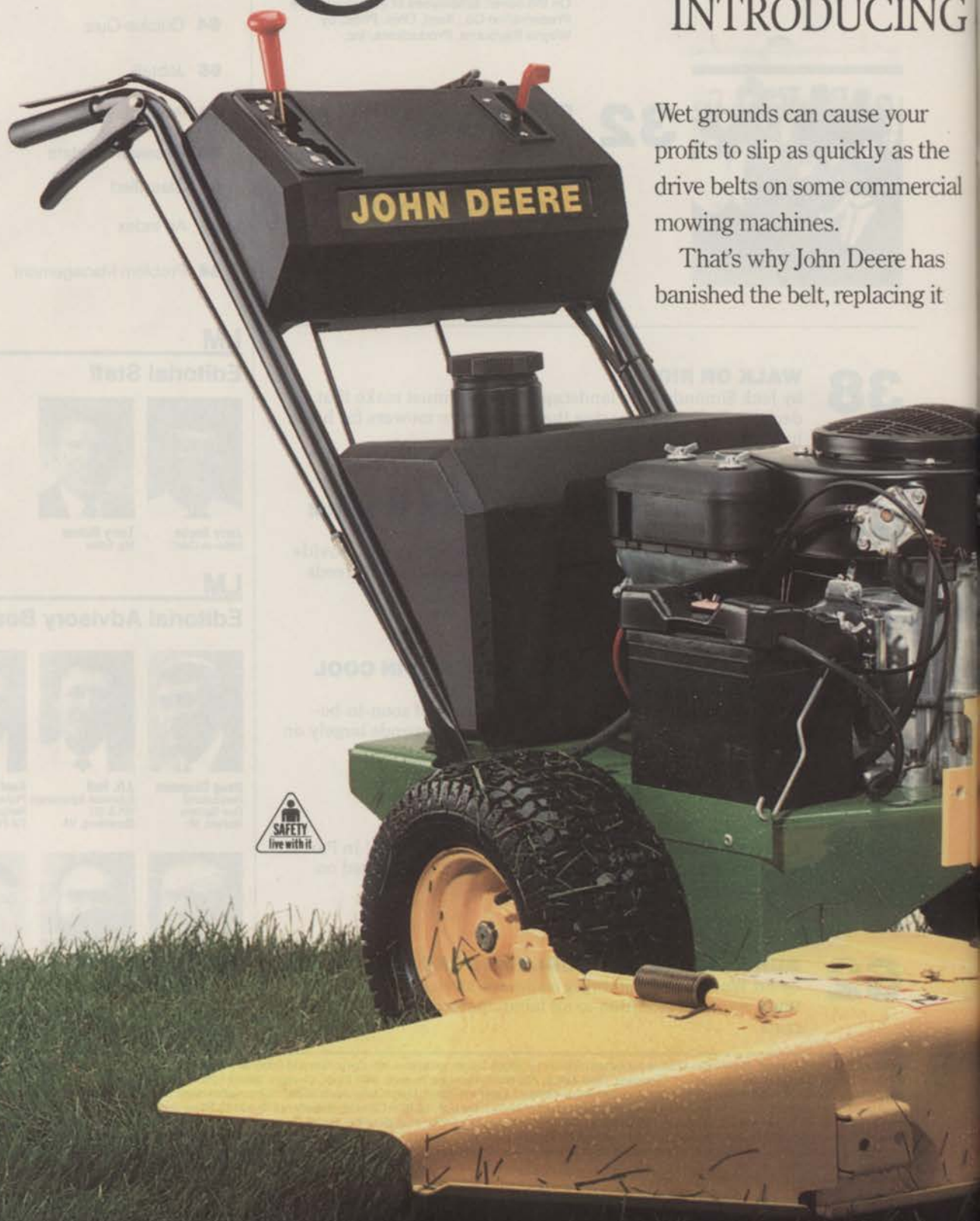


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More on the 'recession'

● According to a recent article in "Forbes" magazine, the boom that the golf industry and the National Golf Foundation has been touting for the last three years never really existed.

The article painted a bleak picture for the golf industry, noting six Chapter 11 filings by golf course developments in New England, and foreclosure of Ipswich (Mass.) Country Club.

It said that "only" 200 golf courses will probably be built in the next two years. It quoted one supplier as saying the market will grow between two and five percent per year.

● At the most recent Virginia Turfgrass Conference, green industry consultant Ed Wandtke predicted that lawn care business will increase between three and five percent in 1991. This, Wandtke said, is a far cry from the 20 percent annual increases we were seeing in lawn care revenues during the early 1980s.

And now I'm going to tell you that the green industry, taken as a whole, is recession-proof. And you're going to say, "huh?" And I'm going to explain:

There is no doubt about it, the United States is in an economic recession. All economic indicators, at this writing, were hitting the silk faster than the 101st Airborne. Most production-based industries (except defense) were reporting revenue losses.

Yet the sales of service-based industries remain steady. And even the most pessimistic of pessimists are predicting some growth for the green industry. Two to five percent—from the vantage point of industries expected to lose 10 and 15 percent in 1991—must look pretty healthy.

Wandtke also explains that he expects to see a 20 to 30 percent increase in landscape sales this year, which is largely unheard of in this type of economy. Why?

"The customer mix changes in an economic stress period," Wandtke says, "but the business doesn't go away."

"Among homeowners, especially, I believe you'll see a recommitment to their current properties, rather than wanting to spend \$150,000 on new houses."

Wandtke sees families staying at home for vacations this summer. Why go to Orlando or Hilton Head to play golf and pay for extra housing when you've got a perfectly good roof over your head to start with?

Eldon Dyk, current president of the Associated Landscape Contractors of America, agrees in principle with Wandtke. He reveals his thoughts in Jack Simonds' article elsewhere in this issue.

Our conclusion, then, based on what we've heard in three months of trade shows and telephone conversations, is this:

The green industry is virtually recession-proof. There might be intensified jockeying for customers or budgets, but the astute landscape manager will indeed come through the recession in excellent shape. Bet on it.

Jerry Roche, editor-in-chief

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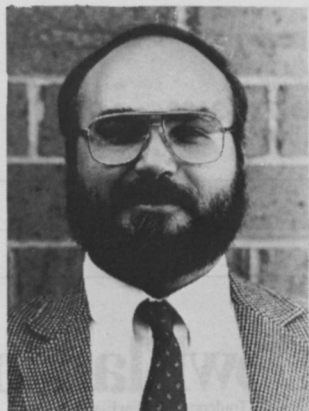
EQUIPMENT

Cornell U. research proves mulch mowers' superiority

ITHACA, N.Y. — Mulching mowers yield healthier lawns and their use should be a standard practice throughout the turfgrass industry, Cornell University's Dr. Martin Petrovic says.

"The whole industry should be using mulching mowers," he says. "A mulched lawn always looks better than a non-mulched lawn because you have healthier turf when returning clippings as added nutrients."

Petrovic, associate professor of turfgrass science,



Petrovic: Mulching can reduce N requirements.

cites an earlier Michigan State University study which showed that mulching produces generally healthier and greener lawns both because of added nutrients and allowance for evaporation at the soil level without thatch buildup.

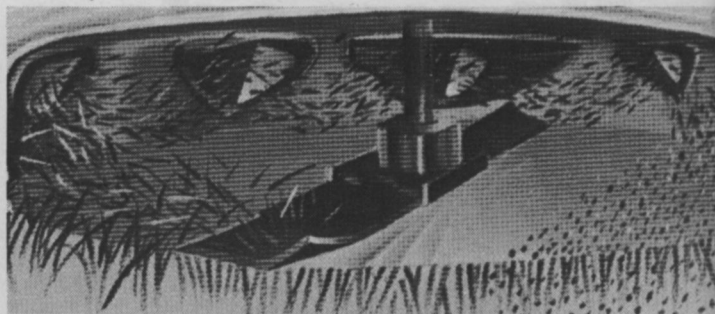
The study also found mulch particles decompose and are absorbed by the grass root system within 14 days.

Mulching also can reduce nitrogen fertilizer needs by 30 percent.

Petrovic's remarks came at a recent seminar in Troy, N.Y. at the headquarters of Garden Way, Inc., which manufactures Troy-Bilt and Bolens tillers, mulching mowers, chipper-shredders and outdoor power equipment.

The company says mulching mowers are gaining support from agronomists and turfgrass experts.

For more information on current overall trends in mowing equipment, refer to the article beginning on page 38 of this issue. □



Mulching mowers like Toro's patented Recycler (shown above) chop grass leaf blades into fine pieces that don't ordinarily 'clump,' leaving clean, well-groomed lawns.

RISE names 1st director

WASHINGTON, D.C. — Allen James has been named executive director of Responsible Industry for a Sound Environment (RISE), an organization recently formed to address the issues affecting the \$1.3 billion specialty pesticides industry.

"James brings considerable management experience and broad knowledge of the industry to this important environmental position," say David Duncan and Jay Vroom. Dr. Duncan of Monsanto was search committee chair; Vroom is president of the National Agricultural Chemicals Association.

One of the main functions of RISE is to explain the benefits associated with proper use of pesticides, including benefits to the public health. Membership is composed of manufacturers, formulators and distributors of specialty pesticides; associations, media, academia and equipment manufacturers. □

INDUSTRY

Customer service easy as counting, says ALCA speaker

NASHVILLE, Tenn. — Creating good customer service is as easy as 1-2-3-4-5-6-7, says Richard Akerman, president of Northwest Landscape Industries.

Akerman, speaking before the Associated Landscape Contractors of America (ALCA), listed the seven "basics of customer service" that all industry professionals can benefit from.

1. The secret to winning customers is to reward them. Be prompt, kind, agreeable, complimentary, polite, make recommenda-

tions and deliver more than you promised.

2. Forget about selling. Concentrate on helping customers decide what's best for them.

3. Remember that the greatest customer you'll ever win is you, because the best sales person is the true believer.

4. The only two things people really buy are good feelings and solutions to problems.

5. Remember that when in contact with a customer, you are the company.

6. Providing excellent

LANDSCAPING

Construction downswing helps free up labor force

ORLANDO, Fla. — Mike Stewart of Ground Control Environmental Services says that competition for college graduates is strong in the landscape market. "We all recruit," says Stewart. "In the past, there were 10 jobs for every graduate. But the downswing in construction has helped."

"Over the last several years, many companies have sprung up to take advantage of the good times," he notes. But, he adds, in his area the landscape construction boom is over, and more design/build companies are doing more full-service maintenance, especially among corporate clientele.

Promotion from within is "without a doubt," a tenet of Stewart's business management. "I would say half the staff has been promoted from within the organization. Quite a few of the supervisors who started out as laborers showed some aptitude.

"One was a carpenter from Trinidad. We didn't identify him as anyone spe-

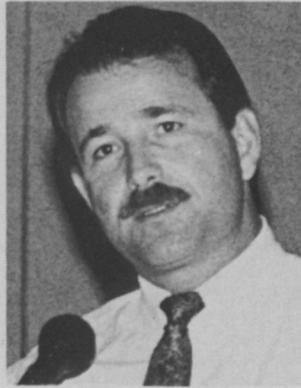
cial. He was dependable, and now he runs one of the crews."

Do low wages keep people away from landscaping? "I think it's a combination of that and the business," Stewart admits. "It's weekend work, it's a lot of late work. It's not a nine-to-five job."

What frustrates Stewart are the times at which he establishes his prices based on proper horticultural treatments—such as applications of pre- and post-emergence control products—and finds companies bidding at prices that are lower than Stewart's chemical costs.

"I try to explain to the contract administrator that my chemical costs are more than what (the competitor) is charging," says Stewart. "He's going to cut the lawn; that's all he's going to do."

"And the sad thing about it is that you probably won't see a difference for the first year. But long term, you're going to have problems with evergreens, crabgrass, broadleaves." □



Akerman: to sell, you must truly believe in company.

service isn't enough. You need to subtly remind the customer that you're doing so.

7. To win new customers, ask the golden question: what is their unmet want? To keep current customers, ask them, "how are we doing?" □

Next month:

- Top 50 landscapers
- Warm-season insect control
- Making your job safer
- Right-of-way landscaping

EVENTS

MARCH

13-14: Reinders Brothers Turf Conference, Equipment Show and Service Clinic, Waukesha (Wisc.) Expo Center. Contact: Ed Devinger, Reinders Brothers, (414) 786-3301.

14-15: California Interior Plantscape Association Council conference and trade fair, Sequoia Athletic Club, Buena Park, Calif. Contact: Hartley Bennett, CIPAC Seminar Coordinator, P.O. Box 414, Wickensburg, AZ 85358; (602) 684-7308.

17-20: Public Golf Manage-

ACADEMIA

WTA will open research center

OCONOMOWOC, Wisc. — The O.J. Noer Research Center will soon become a reality at the University of Wisconsin.

Don Roskopf, president of the Wisconsin Turfgrass Association, said at the association's annual conference that ground-breaking took place in October.

"Dreams do come true," said Monroe Miller, superintendent of Black Hawk Country Club. According to Miller, \$100,000 of the \$300,000 cost has been raised.

The 27-room facility includes two conference rooms and pesticide and soil research facilities.

The deed for the completed center will be given to the university.

The Bruce Co. of Wisconsin is playing a large part in constructing and landscaping the center. Industry contributors include the Reinders Bros. and Spring Valley Turf Products. Grass seed was supplied by Kellogg Seed, Old Seed and Northrup King.

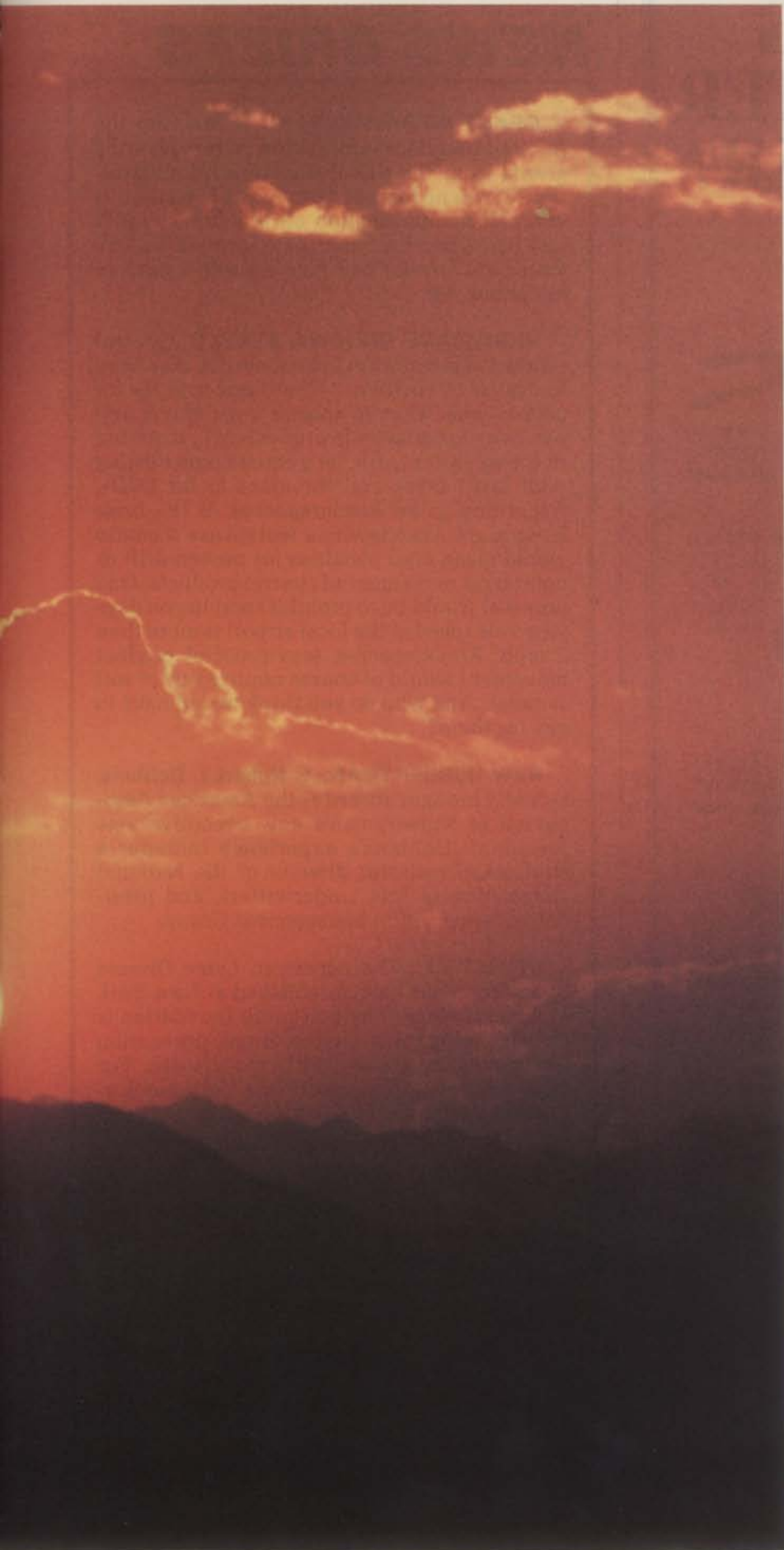
Fund-raising continues. □

ment Association, National Forum on Public Golf Management, Hyatt Regency-DFW Hotel, Dallas. Contact: PGMA, 8030 Cedar Ave., Suite 228, Minneapolis, MN 55425; (612) 854-7272.

27-28: University of California Cooperative Extension Entomology Conference, UC-Riverside. Contact: (714) 787-3718.

27-28: Yard Waste Management Conference, Albany (N.Y.) Hilton Hotel. Contact: Cary Oshins, 466 Hollister Hall, Cornell University, Ithaca, NY 14853; (607) 255-9587.





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NEWS BRIEFS

GRANT INFORMATION II... Remember the number to call for information on tree planting grants from the Small Business Administration? It was no longer in service by presstime. If you call for information on the grants, you'll just be referred to your state forester. So call your state forester and save yourself a game of telephone tag.

NIGHTMARE ON IOWA STREET...Control product applicators in Iowa some day may have to deal with "drifters." That's our new tag for people who want to impose regulations and penalties for miniscule product drift. It started in the ag sector (sure, let's equate crop dusting with lawn care), and threatens to hit LCOs. According to **Ed Rinderspacher** of the Iowa Lawn Care Association, a worst-case scenario would mean civil penalties for proven drift or non-target movement of control products. One proposal would be to prohibit spraying on days when air speed at the local airport is more than 7 mph. Rinderspacher says proof of product movement would of course require turf or soil samples. And who do you think would have to pay for them?

NEW NURSERYMAN...is **Robert J. Dolibois**, recently brought aboard as the American Association of Nurserymen's new executive vice president. Dolibois's experience includes a stint as an assistant director of the National Association of Life Underwriters, and president of Association Management Group.

LYME TIME...The American Lyme Disease Foundation has been established at New York Medical College. The non-profit foundation is for advancing research, treatment, prevention and public awareness of Lyme disease. For more information, contact New York Medical College, Valhalla, N.Y. by phoning (914) 993 4529; (914) 993-4536.

BOOK MONEY FOR KIDS...More than \$25,000 in post-secondary scholarships is to become available for the dependents of small business owners in the U.S. and Canada. "We know that education is essential in today's knowledge-based society," says Dan Sautner of Padgett Business Services, Athens, Ga. Padgett, a network of more than 130 franchises providing accounting and tax services to small businesses, is sponsoring the scholarships. For more information, call (404) 548-1040 in the U.S. or (416) 890-5777 in Canada.

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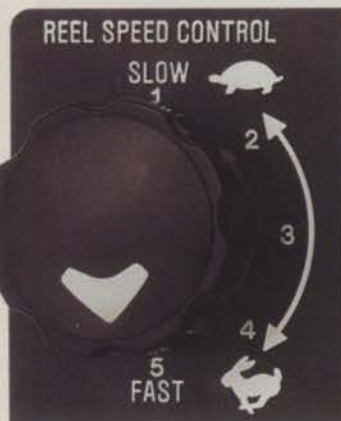


The Toro 450-D gives you protection against hydraulic fluid leaks. Wherever possible, hoses have been replaced with strong steel lines and O-ring seals protect connections. A hydraulic warning system flashes an alarm when the fluid level drops. For easy servicing, test ports for the hydraulic system are right on the side of the machine.



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ATHLETIC TURF

Foxboro to natural grass

Installation of a new heated sand-based grass field in Foxboro Stadium, home of the New England Patriots' NFL team, has begun. The natural surface will replace the seven-year-old artificial SuperTurf surface.

"This is a great commitment on behalf of Victor Kiam and the Patriots organization to install a proven natural turf field," says Patriot CEO Sam Jankovich. "This is in the best interest of Patriot players and other players around the NFL. In addition, such a surface is conducive to a better brand of football.

The surface is designed and installed by Randall & Blake Environmental Contractors of Littleton, Colo., which built the Denver Broncos' practice fields in 1989.

The grass surface should be completely installed by May 1, and the field should be ready to play by June 1, according to Dan R. Almond of Randall & Blake.

Mark Altman of Altman & Altman is being retained as turf consultant.

Spring institute grows

California Polytechnic University in Pomona has expanded its eight-year-old spring institute and trade show to include a grounds operations conference.

The Sports Turf Institute and Grounds Operations Conference will be held March 19 this year. Educational sessions are slated for morning hours, followed by lunch and trade show and equipment sessions after noon.

"The new program will offer the latest information on maintaining trees, groundcovers and turf on tight institutional budgets," says conference chairman Dr. Kent Kurtz. "It will stress the basics, such as irrigation, fertilization, pest control, plant selection, water conservation, planning and pruning."

For more information, call Cal Poly's Horticulture Department at (714) 869-2219.

To join STMA

To receive information on services offered by the Sports Turf Managers Association, write: STMA, P.O. Box 98056, Las Vegas, NV 89193 (702) 739-8052.

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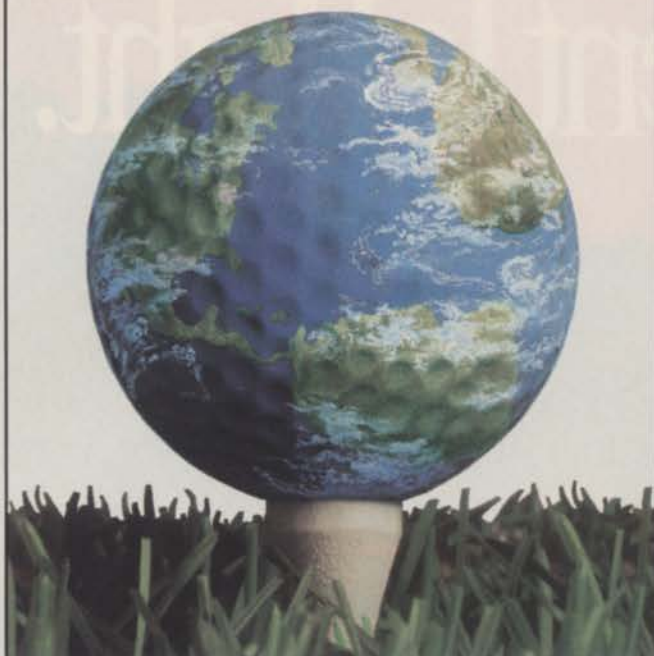
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PEOPLE

Runnin' Reb pride extends to campus

LAS VEGAS, Nev. — Students at the University of Nevada, Las Vegas (UNLV) have reason to celebrate again this spring: their varsity basketball team is apparently poised to defend its national championship at the upcoming NCAA tournament.

But students have another reason to be proud: the way **Dennis Swartzell** and his maintenance crews groom the campus. Landscape crews have even let school pride affect their attitude.

"Our tree crew calls itself 'Your Runnin' Rebel Tree Crew,'" says Swartzell, who heads up a staff of 34 responsible for 100 landscaped acres.

"Beyond that image the basketball team provides," says Les Raschko, "you can



Swartzell: in charge of 'poor man's overseed'

see an emerging, young, growing and proud university. Dennis and his staff do an outstanding job; we have a modern-looking, well-dressed campus." Raschko is

continued on page 26

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Everett Mealman, President
PBI/Gordon Corporation

The Embark PGR programs for growth regulation of fine turf are surely the most important developments to date in landscape management. They can dramatically increase the productivity of turf managers ... and productivity, of course, is the ultimate generator of profits.

The recommendation for maximum growth suppression of cool-season

fine-turf species is a tank mix of Embark Lite and Limit.

Embark Lite (Mefluidide) is specially formulated and labeled for use on fine turf. And Limit is amidochlor, the root-absorbed turf growth regulator developed by Monsanto and recently acquired by PBI/Gordon.

This easy-to-handle tank mix, when applied to cool-season grasses prior to

the major growth period, will reduce the number of mowings up to 50% for five to six weeks at a cost of approximately \$45.00 per acre — the average cost of one mowing.

But that's only part of the good news: Turf discoloration is avoided with this combination, when used as directed. At the end of the six-week cycle when untreated turf tends to fade, the release of pent-up energies in the Embark Lite/Limit-treated turf results in a rich, vibrant green color.

And, notice, we haven't even mentioned the environmental bonus of reduced clippings.

On the other end of the Embark programs, an application of just Embark Lite will by itself slow down the growth for three to four weeks to such a degree that the mowers will virtually float over the turf ... clippings will be significantly reduced ... you'll be able to stay on schedule even during the peak growing season ... and the cost will be only \$18.00 per acre.

What users say

Paragon Lawn of Edina, Minnesota is typical of the many turf management professionals throughout the country who are using Embark. Paragon is a total landscape management company owned and operated by the husband-wife partnership team of Dan and Jill Rosen.

The business is oriented toward high-visibility commercial properties in the Minneapolis suburbs, where immaculate turf is a vital part of the image the property owners want to project to the public.

A typical area where Jill and Dan Rosen, of Paragon Lawn, use Embark Lite. For approximately \$18.00 per acre they can literally take the fight out of cool-season grass, so that even in the peak growing period they not only can stay on schedule but the mowed premises will maintain their freshly cut appearance longer.



On several properties, Paragon has total responsibility for designing and executing the complete program on an annual bid basis. "Such property owners don't really care what we do or when we do it," says Rosen. "The issue is that a constant image of quality and neatness be maintained."

In such instances the Rosens factor into their bid an Embark Lite/Limit tank mix treatment twice a year. Once in the spring, ahead of seedhead emergence, and a repeat prior to the fall growth season.

"It reduces our mowing costs by more than 50%, at a cost of less than \$45 per acre, while actually improving the appearance of the grass..." states Rosen.

On the other hand, Paragon has many customers who are on a regular mowing schedule. "We get paid a flat fee per mow," says Rosen, "and at the peak of the growing season it can be a real back breaker to stay on schedule and maintain a manicured appearance."

"This is where Embark Lite is ideal. During the peak growing season, we can definitely put money in the bank by spending \$18 per acre out of our own pocket for a treatment of Embark Lite that lasts three to four weeks. It eliminates double mowing... it makes clipping clean-up a breeze... it takes pressure off men handling the mowers... and, best of all, it keeps us on schedule."

Interestingly, the Rosens were hesitant about getting started with Embark, and actually had a gallon in their machine shop for a year before they opened it. Like so many turfgrass professionals, the concept of suppressing growth made them uncomfortable in light of the fact that they had always measured turf quality and health on the basis of how vigorously it was growing.

Consequently, the Rosens started out very cautiously and tested both the Embark Lite/Limit tank mix and the Embark Lite mowing aid program in low-profile areas and expanded the total commitment as the evidence became overwhelming.



The Beauty of Embark Lite/Limit Tank Mix

Above: John Van Haften, director of research and development for PBI/Gordon, demonstrates the dramatic effectiveness of an Embark Lite/Limit tank mix. This test plot of bluegrass and ryegrass in suburban Kansas City was treated on April 25, 1990. It was mowed once, on May 1 after the PGR kicked in, and never touched again until this photo was taken on May 25. This dramatic reduction in growth occurred in spite of abundant rainfall and excellent growing temperatures.

Embark is the original, undisputed leader of all PGRs for use on turfgrass. It is foliarly absorbed and translocated to the growing points of a plant, and redirects the energy to the roots, thus preventing seedhead development and stem elongation.

For almost ten years, Embark has been virtually unchallenged for use on low-maintenance turf such as roadsides and hard-to-reach areas.

But use of Embark on highly visible fine turf was not recommended until 1986, when PBI/Gordon researchers, as well as several universities, had proven that tank mixes of Embark and Ferromec® AC Liquid Iron could eliminate the problems of turf discoloration.

Limit, on the other hand, is root absorbed and has been recognized from its inception as the PGR for maximum growth suppression on fine turf without problems of discoloration. The major drawback was its cost.

Happily, a tank mix consisting of reduced rates of both Embark Lite and Limit has proven to be the perfect marriage. It results in growth control for five to six weeks; control of seedheads and stem elongation; reduction of clipping volumes; strengthening of the roots... and all of this for only \$45 per acre.

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743(N)-191

Circle No. 126 on Reader Inquiry Card



The UNLV campus, an oasis in the middle of the southern Nevada desert, is seen in all its splendor in the spring.

PEOPLE from page 22
 director of university news and publications.

Swartzell came to UNLV 8½ years ago from the University of Georgia. He has seen student enrollment grow an average of 10 to 12 percent per year to a current total of 18,216.

"Las Vegas is two different communities," Swartzell observes: "the strip, with all its glamour, and the community we live in. The community has a direct involvement in

the arts and culture, (and) the gaming industry has made significant contributions to our campus.

Dominant turf is tall fescue, but common bermuda infestations necessitate overseeding the entire campus. Swartzell's crews perform what he calls a "poor man's overseed:" no scalping or dethatching or top-dressing. "We basically skip a mowing, distribute the seed, drag it in, roll it and mow it. We leave the

clippings as mulch. Timing is critical," he notes.

Though water use is not a critical issue yet, Swartzell thinks to the future.

"We've had seemingly ample water (from the Colorado River system) with no end in sight," he observes. "But we've realized that it's going to be an issue. We will eventually be moving to less turf, out of necessity. And we've pushed for computerized irrigation;

we're hoping to complete a feasibility study this year." That's not all.

"We're trying to introduce drought-tolerant plants like acacias and mesquites. Aleppo pines were introduced 20 years ago. The mulberries are fast shade-producers."

"Las Vegas," he further notes, "has always been looked upon as a suburb of California, but that doesn't really fit us. We've got more
continued on page 30

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chemical into the air, TEMPO also costs less than other leading insecticides.

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PEOPLE from page 26



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of a Southwest look, but we need to have our own style, and that's tough."

The xeric demo garden could be a portent of the future. Swartzell takes pride in the three-year-old project that contains 150 species of plant material.

"It gives you the feeling of being in the middle of the Sonoran Desert," Swartzell says. "We're going to try and incorporate some garden features into other parts of the landscape."

Mountain States Nursery in Arizona donated shrubs to the xeric garden. Arid Zone Trees, also in Arizona, donated trees. And sixty tons of Aztec sandstone boulders came from John Muir & Co.

The xeric garden is awash in color by January. Cassia gives it a deep yellow color and 'Texas Ranger' leuco phyllums add blue.

"I'd personally like to try some more theme gardens: native, Mediterranean or even Oriental," Swartzell says.

While Swartzell himself becomes more involved in facility planning and site development ("We're filling up the vacant desert"), Paul Dzerk has joined the staff as horticultural specialist to train the troops, inspect construction, keep pest and registration records, and control quality.

And the inimitable Jerry Tarkanian, of course, maintains control of the Runnin' Rebs' basketball fortunes.

—Jerry Roche


President Bush honored by ALCA

President George Bush has won the first "President's Award for Environmental Excellence" sponsored by the Associated Landscape Contractors of America (ALCA). He was selected, in particular, because of his America the Beautiful" program.

Steve Wharton of Steve's Landscaping, Ft. Worth, Texas, and David L. Phelps of Suburban Lawn & Landscape Services, Crownsville, Md. have been appointed to fill vacancies on the board of directors of the Professional Grounds Management Society (PGMS).

Dr. Phil Robinson has been appointed director of research for Agri Growth Research of Indianapolis. He was previously with Hoechst-Roussel.

Winner of the Nebraska Turfgrass Foundation's Distinguished Service Award is Dr. Robert C. Shearman, a former LANDSCAPE MANAGEMENT technical advisor. □



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- **SURVEY INFORMATION** — The Society conducts research on operational practices. These surveys are made available to members only.
- **GUIDELINE PUBLICATIONS** — AVAILABLE FREE TO ALL MEMBERS:
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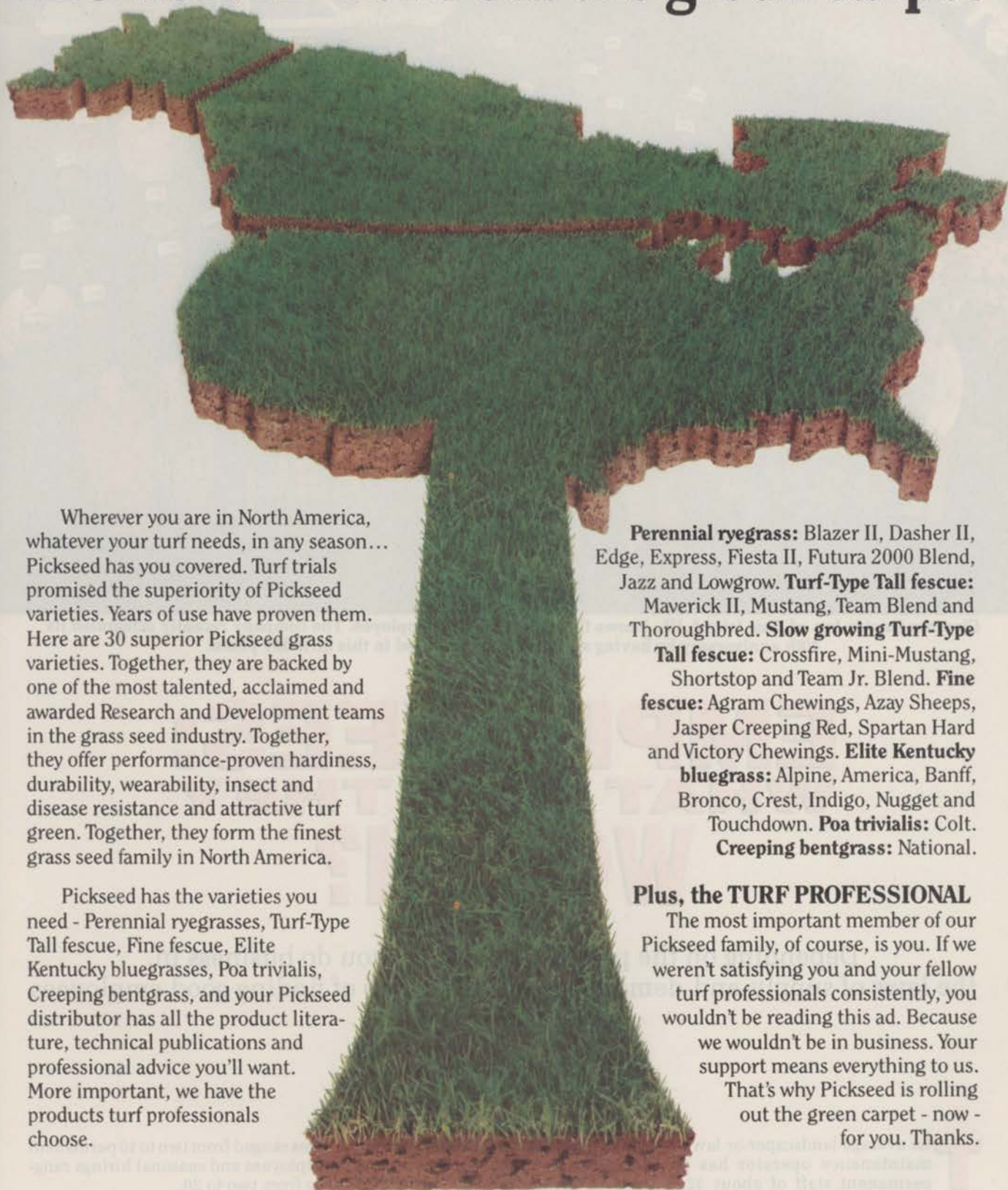
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Clarence Davids Inc. of Blue Island, Ill., knows the value of a good employee. The company recently celebrated its 40th anniversary by having all its workers included in this birthday photo.

EMPLOYEES: WHAT ARE THEY WORTH?

Depending on the part of the country you do business in, the laws of supply-and-demand govern the value of finding good employees and keeping them.

by Jack Simonds, contributing editor

The average landscaper or lawn maintenance operator has a permanent staff of about 32, hires 30 seasonal workers and pays seasonal help about \$6.23 an hour.

Those are among the findings in a seven-point random telephone poll to 21 landscape and lawn care operations throughout the United States.

Different sizes were chosen when

contacting green industry businesses.

Landscape firms ranged in annual gross earnings from \$3 million or more employing up to 120 permanent staff and 220 seasonal hirings to firms with five permanent staff, six seasonal hirings and annual gross earnings between \$100,000 and \$250,000.

In the LCO category, annual gross earnings were not available, but staff

sizes ranged from two to 10 permanent employees and seasonal hirings ranging from two to 20.

The poll shows the average nationwide salary for a crew leader is about \$14,405, a scale which fluctuates greatly between regions.

The Plains States leads all regions with an average supervisor or crew leader salary of \$24,750. The Far West

LM MINI-SURVEY

AVERAGE ANNUAL SALARY, CREW LEADER/FOREMAN, BY REGION



AVERAGE HOURLY WAGE, LINE-LEVEL TECHNICIANS, BY REGION



Source: Landscape Management phone survey

closely trails at \$23,034. In descending order are the Midwest, \$20,825; the Southeast, \$16,375; the Southwest at \$13,188 and the Northeast at \$13,077.

These figures combine those responding in both landscaping and LCO categories.

In hourly wages, the Far West—California, Oregon and Washington—leads the nation with an \$8.08 average hourly rate for seasonal workers. That average is followed by the Northeast, \$6.40; the Southeast, \$6.30; the Plains States, \$5.75; the Southwest, \$5.50 and the Midwest, \$5.35.

No employer we spoke with reports paying only the federal minimum wage, which will rise from \$3.80 to \$4.25 on April 1. The largest hourly seasonal wage we found is \$11 in Southern California. The smallest is \$4.75 from a New England company.

The LCO market

Neal DeAngelo, 1991 president of the Professional Lawn Care Association of America (PLCAA) says the organization addresses itself to pay scales, benefits issues and the traditional high turnover rate in the industry when members meet in educational sessions at its national convention.

He says that where pay scales may easily vary between regions of the country, so too will both the job pool and the availability of good staffers, factors which can influence pay scales.

"There are pockets throughout the country where (the job pool picture) is entirely different than other areas," DeAngelo says.

The job pool base, which in part may serve to dictate hourly rates in an area, not only can vary from place to place, but also year to year; a fluctuation not lost on the PLCAA president.

Like colleagues across the country, DeAngelo, an operator of a lawn care company in Hazelton, Pa. since 1978, has seen the job pendulum swing at his own business.

"Within our own company, two years back we had a rough time. You'd have a classified ad in for an eternity and get very little response to it. Last year we had no problems with available help," he says.

Other LCOs and landscapers across the country give mixed reports of the labor force in their area (see related story.)

DeAngelo also feels some confidence for the industry as the national economy experiences a

recession of varying intensity from region to region.

The lawn maintenance industry, he recalls, survived nicely, even "boomed" during the early 1980s mini-recession.

"It was one of the biggest boom times in the industry," DeAngelo says, speculating that homeowners then spent more time at home, paying more attention to maintenance and cosmetics of their properties. He says also that people traveled less and tended to forestall purchasing big ticket items.

"Lawn care is not a big ticket item (and) people put more time and effort into their homes (in recession)," says DeAngelo.

The landscape market

Eldon Dyk, 1991 president of the Associated Landscape Contractors of America (ALCA), sees an overall shortage trend for entry-level workers.

"And I'd say the (short) labor supply will be pretty much all over the country," Dyk says, "although some areas will be affected more than others.

"The availability is not as it used to be," he adds.

In hourly landscaping crew wages, the Far West—California, Oregon and Washington—leads the nation with an \$8.08 average hourly rate.

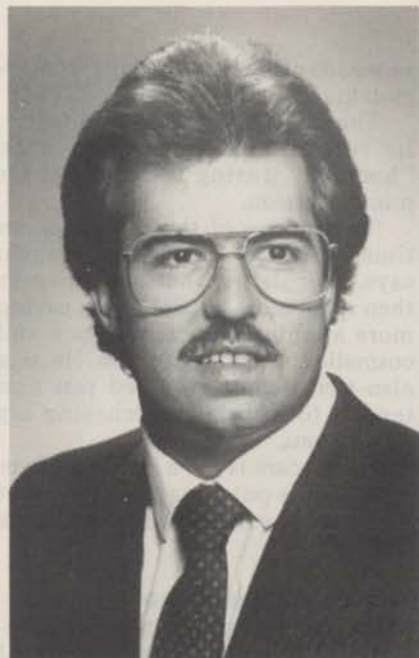
Dyk points to two factors in the labor shortage: fewer young people (18 to mid-20s) in the population and greater competition from national fast food restaurants and other chains.

Also, Dyk notes that pools of migrant and other foreign workers are dwindling as well.

Readjusting entry-level wages should be discussed, something the ALCA's Crystal Ball Committee is undertaking now.

Extending health benefits to line workers also is discussed by industry watchers which "immediately raises the cost of doing business," says Dyk.

Benefits, entry-level wages and the labor pool combine to form the "crunch



Neal DeAngelo: no 'big ticket'



Eldon Dyk: 'crunch issues'

issues" before the industry as the country look toward Recession, 1991.

Dyk, operator of a landscaping firm in Denver, Colo., says his area—including Texas, Oklahoma and other oil-dependent state economies—has been in a slowdown for five years.

In that time, he learned some lessons.

"You have to do business a little differently. You operate in a different mode: cutting back on overhead and staff and tightening your belt," Dyk says.

Still, Dyk believes, landscaping overall "looks good."

"You simply have to be more conscious of costs in order to survive well," he says. **LM**

GLUT OR SHORTAGE?

▷ Warwick, Rhode Island landscaper Gary Rouvelas at Garden Hills Florists, Inc. puts it bluntly: "We've got the pick of the litter."

▷ In Danville, Calif., landscaper Roger Fiske of Fiske Landscaping, chooses the word "horrible" to characterize the availability of good workers to draw from when seasonal hiring time approaches.

In a national economy tarnished by recession, the job pool for both landscapers and LCOs seems dictated by the slowing economy's effect in the immediate region.

Consider:

● Winchester, Mass. landscaper Brent Totman at Mahoney's Rocky Ledge Farm notes that two years ago the industry in his area was "standing on its head" to attract good workers. "I now have a stack of resumes on my desk. It is changing very quickly," he says. Also, landscaping as a career is beginning to be more heavily promoted at the high school level in his area, he notes.

● Minneapolis, Minn. landscaper Charles Glossop of Green Masters Industries nearly always enjoys success with walk-in-off-the-street workers for operations in Minneapolis proper—but has difficulty acquiring workers in affluent suburbs where the job market is more competitive.

Rural Minnesota LCO Thomas Rieff of Crystal Lawn Service in North Mankato submits a different picture. "It is tough," he says, "to offer only seasonal (employment) to people looking for permanent positions."

● Fiske thinks response to classified ads is a good barometer. Five years ago, he says, such an ad would net up to 80 calls a day. "Now we get maybe eight calls, and if five who are qualified will take the job, we're lucky," he says.

● Mixed reports emerge from the nation's breadbasket. Nebraska LCO Steve Brownrigg at Down to Earth Lawn Care sees the labor pool in his area as "good relative to other states" but adds he has difficulty securing "qualified, thinking people willing to work outdoors."

Billings, Montana's Jay Wirth of Wirth Landscaping notes his labor pool is a tiny one, but he enjoys drawing from a rural

population where he says the work ethic is strong.

His only real labor problem: "Sometimes it is just trying to find the skills that we need," he says.

If recurring themes do surface nationwide, two seem to be the difficulty in attracting good permanent entry level staff and then keeping them. Englewood, Colo. landscaper Shannon Wilson of Natural Surroundings, Inc. says she, her partner and three permanent staffers recently held a meeting just to discuss those very issues.

"What can be frustrating is not having good people hang with you long enough to get promoted," she laments.

For Greely, Colo. LCO Jay Woods at American Turf and Tree Care, securing good workers is a catch-as-catch-can proposition. "Sometimes you land a good one," he says. "Other times it just doesn't work out."

It seems the industry's traditional vexing turnover rate is more acute in high cost-of-living pockets of the U.S. But Clearwater, Fla. landscaper Christopher Phillips of Landscape Technologies, Inc. reports a different picture.

"I know that labor shortages are supposed to be the problem of the '90s, but we don't have any problem getting help. But we're lucky, we're in a good labor pool," he says.

South Florida LCO Bill Lester of Lawn Care Plus says when he needs more manpower, he relies on a system of contacts built up over the years and easily secures good people for short-term work.

These snags, however, continue to be the difficulty in attracting newcomers either seasonally or as permanent beginning staff primarily because of the low entry-level pay scale and the lack of benefits in many cases. The labor-of-love aspect of lawn maintenance and landscaping might be best seen in the thoughts of Salem, Ore. landscaper Tony DeSantis of DeSantis Landscapes.

"Finding dependable people with a work ethic gets tougher all the time," he says. "The work is hard, you get dirty and you're out in the weather."

—Jack Simonds □

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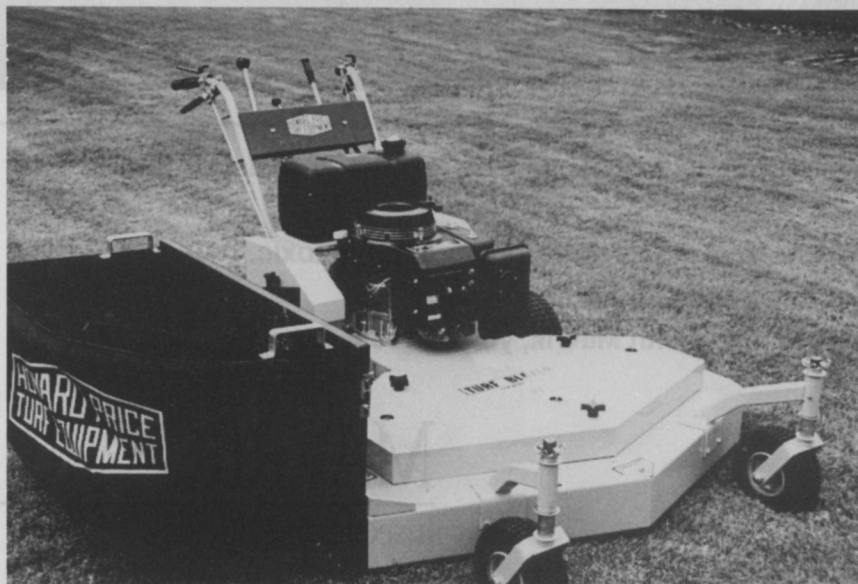
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Jacobsen Crew King



Gravely Pro Series



Howard Price Turf Blazer

WALK OR RIDE?

The landscape manager must make that decision before purchasing the appropriate mowers for his or her immediate needs.

by Jack Simonds,
contributing editor

For lawn maintenance companies, it's decision time, as the rider vs. walk-behind mower purchase nears. Both have advantages and both have a niche in the mid-size lawn mower market.

"Walk-behinds give a good value for a lower price," says Howard Price of Howard Price Turf Equipment. Traditionally cheaper, and believed to be more maneuverable than riders, walk-behinds still offer situations where "certain people will want to step up to riders when the job gets bigger," Price admits. "But there's room in the market for both."

Encore Manufacturing's Dean Meyer agrees. The firm makes a line of walk-behinds and also two styles of sulkies which in some instances can provide the best of both worlds.

"A sulky can make it (a walk-behind) a pretty efficient rider," says Meyer. "But I think landscapers have a variety of different needs," he adds. For the price of one rider, in some instances, the smaller operator can pick up two walk-behinds, but other situations simply call for riders.

Here, then, is a sampler of some new walk-behinds and riders for 1991.

Jacobsen Turf Equipment boasts of its expanded Crew King line with sizes ranging from 32 to 60 inches and coming in floating deck and four fixed deck models.

Floating deck mowers, with 36- and 48-inch models available, have a suspended cutting deck which the company says floats over uneven surfaces, yielding a smooth finish. Two Crew King fixed deck models have been added to the line including a 32- and 60- inch mower. Jacobsen has 36- and 48- inch fixed deck models.

Gravely International's re-designed Pro Series commercial mowers are easier to operate and perform better,



John Deere mid-sized front loader



Walker rider



Toro walk-behind

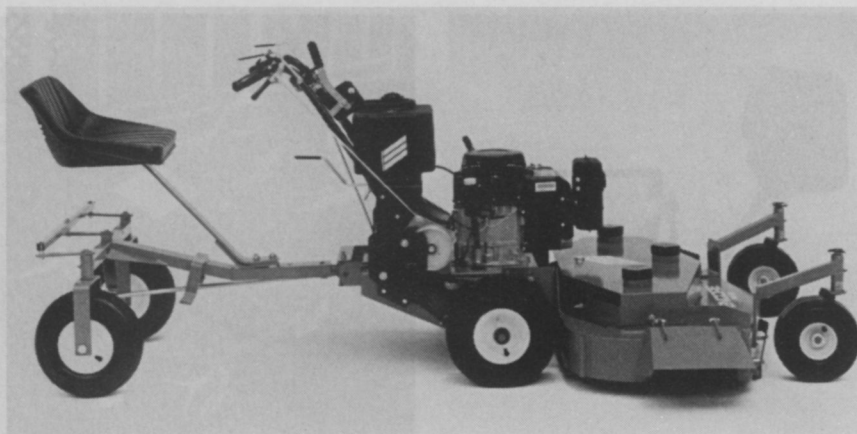
according to the company.

The front-mount walk-behind line sees a second drive belt added to prevent side slippage in wet conditions. Two belts spaced apart bar grass build up and heavy duty control linkage is also standard. The gas tank holds 3.5 gallons and handlebars have been widened. The line has a five-speed gear transmission, adjustable mower decks and instant forward and reverse. Powerplants include 12 and 12.5 hp gas engines. Thirty-two- and 36-inch decks are available. Heavy duty models come in 12.5, 14, 16, 17, and 18 hp motors and 36-, 40-, 50- and 60-inch mowing decks.

From **Howard Price Turf Equipment** comes 36- and 48-inch walk-behinds with both low and high gear, double-belt drive and a 9.5 bushel grass catcher. Equipped with a 3.5 gallon tank, both models come with reverse and easy height adjustment.

John Deere's two new offerings are 17.5 and 20 hp riders with the home and commercial market in mind.

A hydrostatic transmission operates by two foot pedals and cutting height is adjustable by a front crank system.



Encore sulky



Homelite mulching mower

Equipped with power steering, model F710 comes with a 48-inch mower; model F725 with a 54-inch mower.

Walker Manufacturing's GHS commercial rider model has a new blower system designed to reduce clogging and enhance vacuuming.

The model, designed for smaller landscaped areas, offers a Delco maintenance-free battery as standard equipment. Walker says the rider fits into today's landscaping plans for smaller green spots and the unit's maneuverability and running speed should make it competitive with walk-behind models.

A hydrostatic drive option has been introduced in **Toro's** 14 and 18 hp walk-behind Pro-Line, the company announces.

Hydrostatic drive, Toro says, should improve traction because with no belts involved in the drive system, slippage does not occur. Also, like other lines, Toro offers zero-radius turning and instant reverse.

Other new products and features from Toro include a 21-inch Recycler ProLine walk-behind a 48-inch recycler deck for both walk-behind and



Scag walk-behind

riding models and a recycling kit for 32-inch walk-behinds.

Toro's new 724-Z rider can cut up to 25 acres a day, the company says.

Encore Manufacturing announces a sulky to convert any size Pro-Line walk-behind into a rider. Encore says the sulky features an advanced tracking system which puts mower controls within easy reach. The attachment is independently adjustable and is equipped with pneumatic tires, spring suspension and a quick release hitch for conversion back to a walk-behind.

Scag Power Equipment introduces new 36- and 48-inch cutter decks for its zero-turn walk-behind. The line, winner in the overall excellence category at the 1990 International Lawn, Garden and Power Equipment Expo in Louisville, Ky., also includes 52-, 61- and 72-inch cutter decks.

From **Homelite** comes a new lightweight mulching mower designed for home use. With a 5 hp electric start engine, the model features a 20-inch mulching deck and twin multi-level blade design for a double cut.

Homelite already markets 4 and 5 hp mulching mowers with pull starting systems.

Also new to Homelite's line is a three-way convertible mower which comes as a side-discharge model. Kits



Ford Holland rider with hopper

are available for both mulching or addition of a 2.25 bushel rear bag collector.

Ford Holland's models CM224 and CM274, both commercial riders, may now be equipped with a 17-barrel capacity hopper which may be raised up to 73 inches for dumping. The hydraulic system is operated from the driver's seat and is designed to service trailers or pickup trucks. For on-site composting, the system can form two layers, making handling of materials easier, Ford Holland says.

The manufacturer also offers two new triple-bag grass collection systems. The 9.75 barrel capacity bushel



Excel rider with edger

bags is bolted to the tractor by a sub-frame and the hood flips forward for bag removal.

The **Grasshopper Co.** features a line of six riders, all with zero-radius turning and dual-hydrostatic direct drive. Models in the Gemini series range from 18 to 25 hp and are available in air- and liquid-cooled gas engines or diesel engines. Mowing deck sizes range from 44 to 72 inches.

Excel's Hustler Compact Series features an edger attachment, mulching capability and vacuuming collection systems which hold up to eight bushels of debris.

Designed with estates, apartment



Ariens mowing system

complexes, condominiums and other landscapes in mind, Excel compact riders are with 18 and 20 hp powerplants and 51- or 60-inch mowing decks.

From **Ariens** comes several walk-behind choices, notably the introduction of what the company calls a mowing system. Equipped with a 5 hp engine, the new offering mulches, recycles or collects trimmings depending on standard equipment used during mowing. Also an optional dethatcher and mulching enhancer are available. Ariens manufactures a full line including riders and accessory power lawn care gear. **LM**

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POST-EMERGENCE WEED CONTROL IN WARM-SEASON GRASSES

Post-emergence herbicides provide the turfgrass manager with viable options to control weeds during the entire year.

by Tim R. Murphy, Ph.D., University of Georgia

Weed control is the process of limiting a weed infestation so that a turfgrass can properly grow, develop and be aesthetically appealing.

A balanced turfgrass weed control program uses a combination of cultural, mechanical and chemical weed control practices. When properly maintained, warm-season turfgrasses are highly competitive with weeds. Adherence to recommended fertility programs, water requirements, mowing heights and schedules and controlling diseases and insects will dramatically improve the success of the chemical weed control program.

The use of herbicides, in the absence of approved cultural and mechanical practices, will not result in a high quality, warm-season turfgrass.

Turfgrass managers can choose from two types of herbicides to control weeds in warm-season turfgrasses. Pre-emergence herbicides form the base of the chemical weed control program. They are primarily used for the control of crabgrass, goosegrass, annual bluegrass and certain annual broadleaf weeds. Post-emergence herbicides are generally used to control weeds that are not controlled by pre-emergence herbicides, or in the event of a pre-emergence weed failure, as a reliable backup.

Post-emergence herbicides offer several advantages over pre-emergents.

Spot treat, or as needed

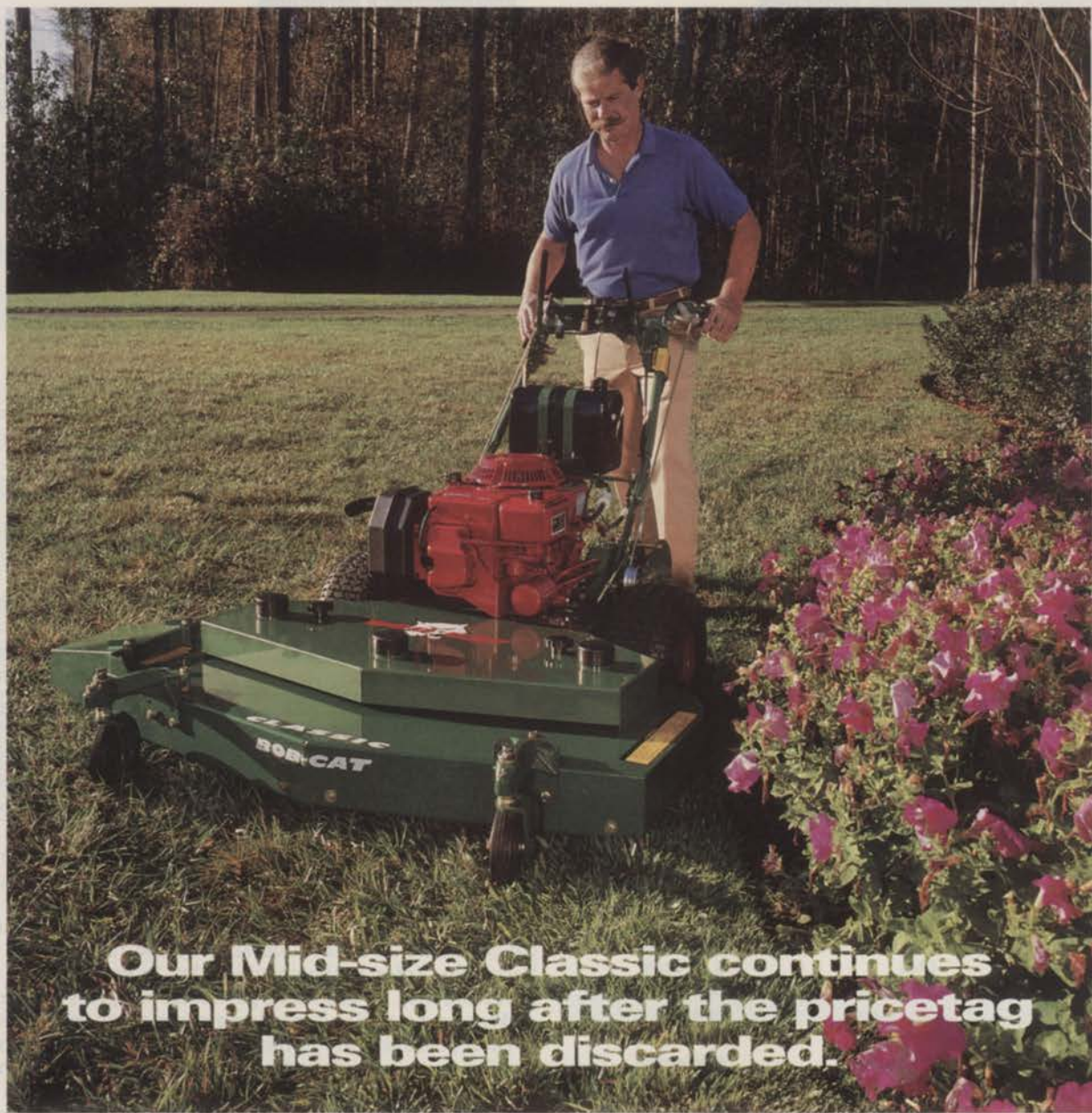
Post-emergence herbicides can be applied on a "spot treatment" or "as-

needed" basis, directly to a weed infestation; pre-emergence herbicides are usually applied to the entire turfgrass area.

Spot treatments of post-emergence herbicides are less expensive than blanket applications of pre-emergence herbicides. Post-emergence herbicides will control many problem annual and perennial weeds not controlled by pre-emergence herbicides.

Low rates of most post-emergence herbicides may be used on newly-sprigged or sodded warm-season turfgrasses.

In areas that are scheduled to be overseeded or renovated, the majority of post-emergence herbicides can be used up to one month before renovation. The time interval from application to seeding, sprigging or sodding operations for pre-emer-



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TABLE 1. Common and trade names of warm-season turfgrass postemergence herbicides.

Common Name	Trade Name(s)	Company(s)
asulam	Asulox	Rhone-Poulenc
atrazine	Aatrex, Others	Ciba-Geigy, Others
bentazon	Basagran	BASF
bromoxynil	Buctril	Rhone-Poulenc
2,4-D	Numerous formulations are available.	Vertac, Lesco, Fermenta, Others
2,4-D + dicamba	Eight-One, Phenaban 801	Lesco, PBI/Gordon
2,4-D + dichlorprop	Weedone DPC Amine, Weedone DPC Ester	Rhone-Poulenc
2,4-D + mecoprop	Lescopar, Phenomec 2+1, 2 Plus 2	Lesco, PBI/Gordon, Fermenta
2,4-D + mecoprop + dicamba	Trimec Classic, Trex-san, Three-Way	PBI/Gordon, Sierra, Lesco
2,4-D + mecoprop + dichlorprop	Weedestroy Triamine, Weedestroy Tri-Ester	Riverdale
dicamba	Banvel, Dicamba 4	Sandoz, PBI/Gordon
diclofop-methyl ¹	Illoxan, Hoelon	Hoechst
diquat ²	Diquat	Valent
DSMA	Numerous formulations are available.	Vertac, Vineland, Others
ethofumesate	Prograss	Nor-Am
fenoxaprop	Acclaim	Hoechst
glyphosate	Roundup	Monsanto
imazaquin	Image	American Cyanamid
mecoprop	Mecomec, Lescopex	PBI/Gordon, Lesco
mecoprop + 2,4-D + dicamba	Southern Trimec	PBI/Gordon
MCPA + mecoprop + dichlorprop	Weedestroy Triamine II, Weedestroy Tri-Ester II	Riverdale
metribuzin	Sencor Turf	Mobay
metsulfuron	DMC	O. M. Scott
MSMA	Numerous formulations are available.	Fermenta, Platte, Others
MSMA + 2,4-D + mecoprop + dicamba	Trimec Plus	PBI/Gordon
pronamide	Kerb	Rohm-Haas
sethoxydim	Vantage	BASF

¹ Diclofop-methyl currently has a state label for use in Georgia, Florida and South Carolina. Current labels should be consulted as use directions and trade names vary between states.

² Diquat has a state label in Arkansas, Louisiana, Mississippi, Oklahoma, Tennessee and Texas for winter annual weed control in dormant bermudagrass.

Source: The author

TABLE 2. Warm-season turfgrass tolerance to postemergence herbicides.

Herbicide	Turfgrasses					
	Bahia-grass	Bermuda-grass	Centipede-grass	Carpet-grass	St. Augustine-grass	Zoysia-grass
asulam	NR-S	T ¹	NR-S	NR-S	T	NR
atrazine	NR-I	I	T	NR-I	T	I
bentazon	T	T	T	NR-I	T	T
bromoxynil	T	T	T	NR-I	T	T
2,4-D	T	T	I	I	S-I	T
2,4-D + dicamba	T	T	S-I	S-I	S-I	T
2,4-D + dichlorprop	T	T	I	I	I	T
2,4-D + mecoprop	T	T	S-I	I	S-I	T
2,4-D + mecoprop + dicamba	I-T	I-T	S-I	S-I	S-I	T
2,4-D + mecoprop + dichlorprop	T	T	I	I	I	T
dicamba	T	T	I-T	I	S-I	T
diclofop-methyl	NR	T	NR	NR	NR	NR
DSMA,MSMA	NR-S	T	NR-S	NR-S	NR-S	I
fenoxaprop	NR-S	NR-S	NR-S	NR	NR-S	T
glyphosate ²	S(D)	S(D)	S	S	S	S
imazaquin	NR-S	T	T	NR-I	T	T
MCPA + mecoprop + dichlorprop	T	T	I	I	I	T
mecoprop	T	T	S-I	I	S-I	T
metribuzin	NR-I	T	NR-S	NR-S	NR-S	NR-S
metsulfuron	NR-S	T	NR-T	NR	T	NR-T
pronamide	NR-S	T	NR-I	NR	NR-I	NR-I
sethoxydim	NR-S	NR-S	T	NR-I	NR-S	NR-I

T = Tolerant at labeled rates; I = Intermediate tolerance, use at reduced label rates; S = sensitive, do not use this herbicide; D = Dormant; NR = Not registered for use on this turfgrass.

¹ Labeled only on 'Tifway' (419) bermudagrass and St. Augustinegrass.

² Bahiagrass and bermudagrass are tolerant to glyphosate when completely dormant.

Source: The author

differently to the same herbicide. For example, Meyer zoysiagrass has better tolerance to MSMA than Emerald or Matrella.

The most important factor in selecting a post-emergence herbicide is the tolerance of the turfgrass to the herbicide. Refer to the specific label to determine if the herbicide may be used on a particular turfgrass species.

Weed species. Similar to turfgrasses, weed species vary in their susceptibility to herbicides. Correct weed identification is a prerequisite for selecting an appropriate herbicide. Weed identification manuals and identification assistance is available at many county extension service offices. Several chemical companies also distribute excellent weed identification guides.

Time of application. The time of year that a herbicide is applied can influence turfgrass tolerance. For example, dormant bahiagrass and bermudagrass have excellent tolerance to Roundup. However, severe injury will occur if this herbicide is applied to semi-dormant or actively-growing bahiagrass or bermudagrass.

The risk of injury from post-emergence herbicides is also greater during the spring green-up process (transition from winter dormancy to active growth) than when the turfgrass is fully dormant or actively growing.

Post-emergence herbicides such as 2,4-D + mecoprop + dicamba (Trex-san, Trimec Classic, Three-Way and others) have been shown to slightly decrease the quality of Tifway bermudagrass when applications were made three weeks before or during spring green-up. Image can also cause slight to moderate delays in green-up if applications are made during spring transition.

Research has shown that the decrease in turfgrass quality that may result from using post-emergence herbicides

gence herbicides varies from 1½ to 4 months.

Herbicide selection

Many post-emergence herbicides are available to control weeds in warm-season turfgrasses (Table 1). They all have different qualities.

Turfgrass tolerance. The warm-season turfgrasses dramatically vary in their tolerance to post-emergence herbicides (Table 2). Bermudagrass has good tolerance to MSMA and DSMA; however, carpetgrass, centipedegrass and St. Augustinegrass are severely injured by these herbicides. With the exception of bahiagrass and carpetgrass, warm-season turfgrasses have excellent tolerance to Image.

Additionally, cultivars within a species may respond

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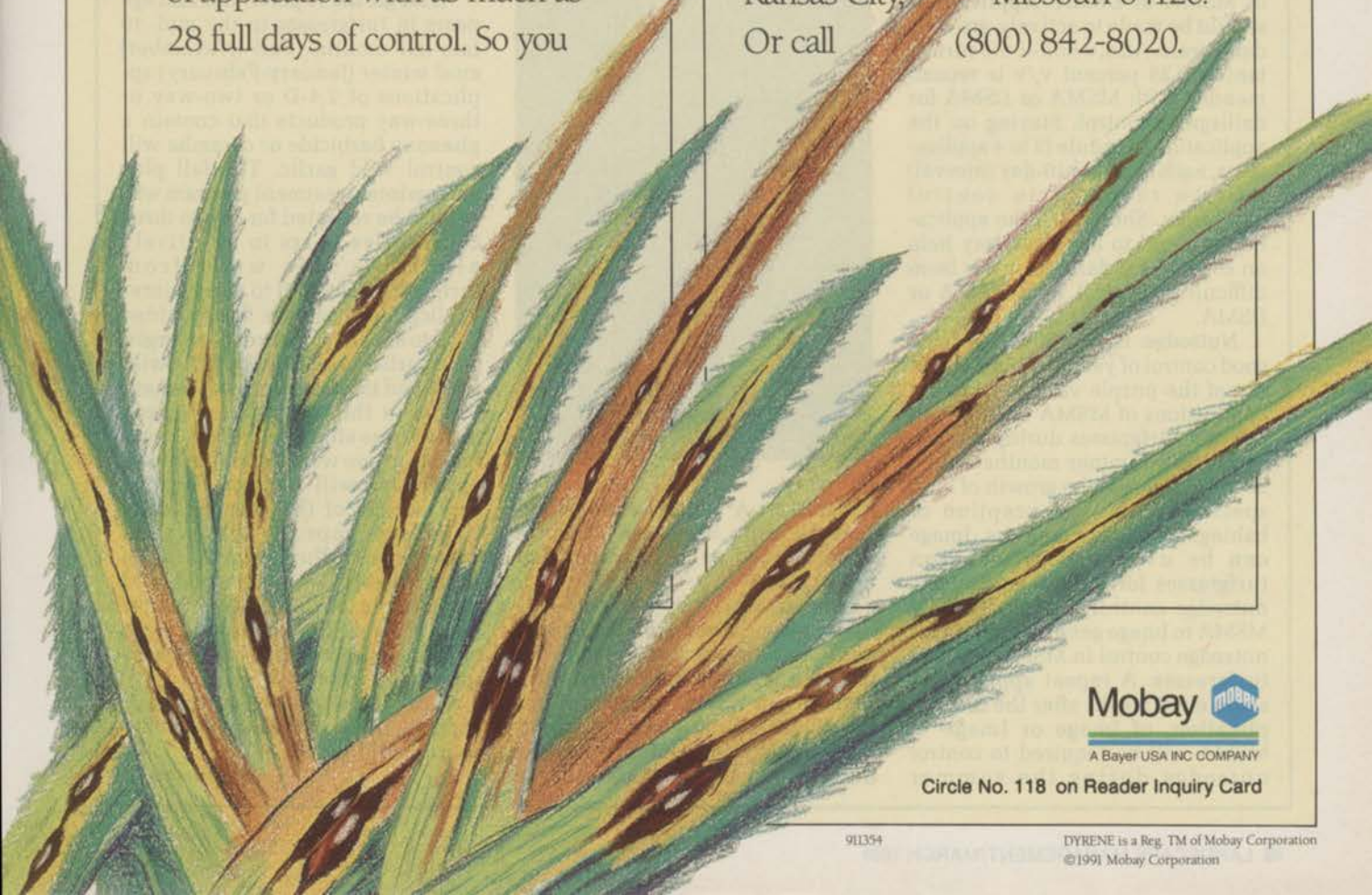



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during green-up persists for two to six weeks after application. Also, in turfgrasses that are severely infested with weeds, better turfgrass growth eventually results due to the elimination of the thick cover of weeds.

In the event that a dense weed population necessitates using a post-emergence herbicide during green-up, use only the lowest recommended or one-half the recommended rate. Low or one-half rates will minimize herbicide injury to the turfgrass.

Application frequency. For some weed species, a repeat application is necessary to effectively control the weed. For example, two applications of MSMA + Sencor, at a 7- to 10-day interval, are necessary to control goosegrass. In contrast, small crabgrass can often be controlled with a single application of MSMA. However, large, well-tillered crabgrass usually requires two applications of MSMA or DSMA, each at a 7- to 10-day interval.

Ornamental tolerance. Turfgrass herbicides are commonly applied to sites containing ornamental plantings. Ornamentals may be injured by spray or vapor drift or by root absorption of the herbicide. Vapor drift is the movement of herbicide vapors from the intended site of application.

Ester formulations of the phenoxy herbicides (2,4-D, dichlorprop) easily volatilize during warm temperatures and can injure sensitive ornamentals by vapor drift. Ester formulations

Problem weed management

Bahiagrass: Repeat applications of MSMA or DSMA at 7- to 10-day intervals will control bahiagrass in MSMA/DSMA tolerant turfgrasses. In bermudagrass and St. Augustinegrass, DMC will effectively control bahiagrass. In centipedegrass, repeat application of Vantage (formerly Poast) at 10- to 14-day intervals will suppress bahiagrass growth and seedhead development.

Dallisgrass: It is believed that most pre-emergence herbicides will control dallisgrass that arises from seed.

Established dallisgrass can be controlled in bermudagrass or zoysiagrass with repeat applications of MSMA or DSMA. Applications should be made to actively-growing dallisgrass. Also, a non-ionic surfactant at 0.25 percent v/v is recommended with MSMA or DSMA for dallisgrass control. Staying on the application schedule (2 to 4 applications, each at a 7- to 10-day interval) will be required to control dallisgrass. Shortening the application interval to five days may help on sites where dallisgrass has been difficult to control with MSMA or DSMA.

Nutsedge: Basagran will provide good control of yellow nutsedge, but not of the purple variety. Monthly applications of MSMA or DSMA in tolerant turfgrasses during the late spring and summer months can be used to suppress the growth of both species. With the exception of bahiagrass and carpetgrass, Image can be used in warm-season turfgrasses for yellow and purple nutsedge control. The addition of MSMA to Image generally improves nutsedge control in MSMA tolerant turfgrasses. A repeat application, six to eight weeks after the first application, of Image or Image + MSMA will be required to control nutsedge during the summer

months.

Prostrate spurge: Control requires repeat applications of two-way or three-way broadleaf herbicides. In bermudagrass, low rates of Sencor (0.125 to 0.25 lb. AI/acre) will effectively control emerged prostrate spurge.

Virginia buttonweed: Rapidly becoming the number one problem broadleaf weed in southern

suppress the growth of Virginia buttonweed. Research conducted in Mississippi has shown that applications of Ronstar or Princep at the time of the 2,4-D + dichlorprop application increased the control of Virginia buttonweed.

The increase in control with Ronstar and Princep is believed to be the control of Virginia buttonweed plants that arise from seed. Turfgrass managers should be aware that Princep is not labeled on southern turfgrasses in the months of June, July and August. However, depending upon the geographical location, a mid-April or May application of Princep may assist in the control of Virginia buttonweed.

Wild garlic: A perennial that appears in turfgrasses in the mid- to late-fall months. Fall (November) and winter (January-February) applications of 2,4-D or two-way or three-way products that contain a phenoxy herbicide or dicamba will control wild garlic. The fall plus early winter treatment program will need to be repeated for two to three consecutive years to effectively eliminate this weed from turfgrasses. Late fall to early winter applications of Image has provided good to excellent control of emerged wild garlic. Image slowly kills wild garlic and treated plants will remain visible in the turfgrass for an extended time after application. Mowing one to two weeks after the Image application will remove a significant portion of the wild garlic foliage and improve the overall appearance of the turfgrass. Image should be applied to emerged wild garlic in the late fall or early winter after the first killing frost or the onset of winter dormancy of the warm-season turfgrass.

In St. Augustinegrass and bermudagrass, DMC will also effectively control wild garlic.

—Dr. Murphy □



turfgrasses. A warm-season perennial, Virginia buttonweed reproduces by seed, cut plant pieces, and fleshy roots.

Research has shown that 2,4-D + dichlorprop (Weedone DPC amine and ester) has provided better Virginia buttonweed control than other two-way or three-way broadleaf herbicides. Monthly applications of 2,4-D + dichlorprop will be needed during the summer months to

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Suggestions for use

Post-emergence herbicides are applied after annual weeds emerge or when new growth of perennial weeds appear in the turfgrass. Follow these guidelines for better weed control and improved turfgrass tolerance.

1. Small, actively-growing weeds.

Perennial and annual weeds that are growing under good soil moisture conditions at moderate air temperatures are easier to control with post-emergence herbicides than weeds that are stressed due to adverse environmental conditions. Target the application to coincide with good soil moisture conditions at air temperatures of 60 to 90°F. Applications on cold, wintery days, or to drought-stressed weeds will result in poor weed control.

2. Do not apply post-emergence herbicides to turfgrasses and weeds that are stressed due to high air temperatures or drought.

The tolerance of warm-season turfgrasses to post-emergence herbicides decreases at air temperatures greater than 90°F, and when turfgrasses are drought-stressed. Additionally, turfgrasses growing under high soil moisture, high relative humidity and high air temperatures, (less than 90°F) have a lower level of tolerance to post-emergence herbicides than turfgrasses growing under similar moisture and humidity conditions but at cooler temperatures.

Herbicides that contain 2,4-D; dicamba; mecoprop; dichlorprop; MSMA and DSMA should not be applied at high air temperatures since there is a high risk of increased turfgrass injury.

Follow label guidelines.

3. Repeated applications at low rates will generally improve weed control and turfgrass tolerance.

Single applications at high rates generally cause more turfgrass injury than repeat applications at low rates. Additionally, single, high rate applications often do not control the weed, particularly perennial weeds. The repeat application is usually made at intervals of 7

to 14 days after the first application, or when regrowth of the weed is noted. Refer to the label for information regarding repeat treatments.

4. Coordinate mowing schedules.

A general recommendation is to delay mowing three to four days before or after a post-emergence herbicide application. The delay prior to application will increase the leaf surface area of the weed and result in better spray coverage and control. The delay after application is necessary to allow adequate time for herbicide absorption and translocation in the target weed species.

5. Do not apply post-emergence herbicides immediately before rainfall or irrigation.

The effectiveness of most post-emergence herbicides is better when rainfall or irrigation does not occur for 6 to 24 hours after application. Rainfall or irrigation immediately after application can wash the herbicide from the treated weed foliage and decrease control.

6. Use surfactants and crop oil concentrates according to label directions.

The effectiveness of many post-emergence herbicides is enhanced by the addition of a crop oil concentrate or surfactant to the spray mixture, particularly under less than ideal spray conditions. However, indiscriminate use of surfactants or crop oil concentrates can increase the risk of turfgrass injury. Check the label for crop oil guidelines.

7. Calibrate spray equipment, train operators.

Weed control failure can be linked to improper calibration of spray equipment.

The tolerance of warm-season turfgrasses rapidly decreases at elevated or higher-than-recommended rates of post-emergence herbicides. Training assistance is available through most county extension service offices and spray equipment company representatives.

—Dr. Murphy □

should not be used during the warm months of the year when environmental conditions are favorable for volatilization. Spray drift damage can be minimized by spraying when the wind velocity is less than 5 mph, and selecting a nozzle tip and spray pressure that produces large spray droplets.

Due to their soil residual characteristics, Aatrex and dicamba (Banvel, Dicamba 4) can injure broadleaf ornamentals via root uptake. Injury to ornamentals is most likely to occur on sandy soils when a heavy rainfall immediately follows application of these herbicides. The potential of these herbicides to injure ornamentals via root uptake can be prevented by avoiding their use over the rootzone of shrubs and small trees.

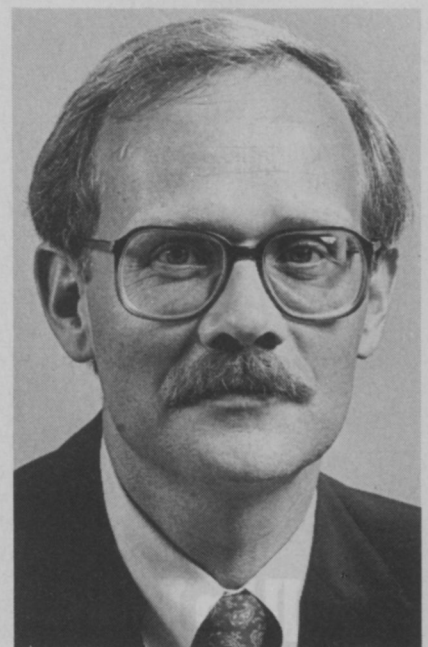
Spring break important

Post-emergence herbicide use should be avoided during the spring transition of warm-season turfgrasses and during periods of extremely high air temperatures.

winter, late spring and early summer months. The majority of turfgrass post-emergence herbicides are more effective when applied to small weeds than when applied to large weeds. Waiting until weeds are in advanced growth stages will usually require that the highest recommended rate be used, and often, a repeat application.

In the event of a pre-emergence herbicide weed control failure, post-emergence herbicides can be relied upon for a complete chemical weed control program. Due to the necessity of repeat applications and temporary turfgrass injury, most managers prefer to use a combination of pre-emergence and post-emergence herbicides to control turfgrass weeds.

Cultural practices that favor vigorous turfgrass growth, the use of pre-emergence herbicides at recommended times of the year, and timely use of post-emergence herbicides will enable the turfgrass manager to achieve the goal of a high quality, attractive turfgrass that is relatively weed-free. LM



Agronomist Tim R. Murphy specializes in weed science at the University of Georgia Cooperative Extension Service.

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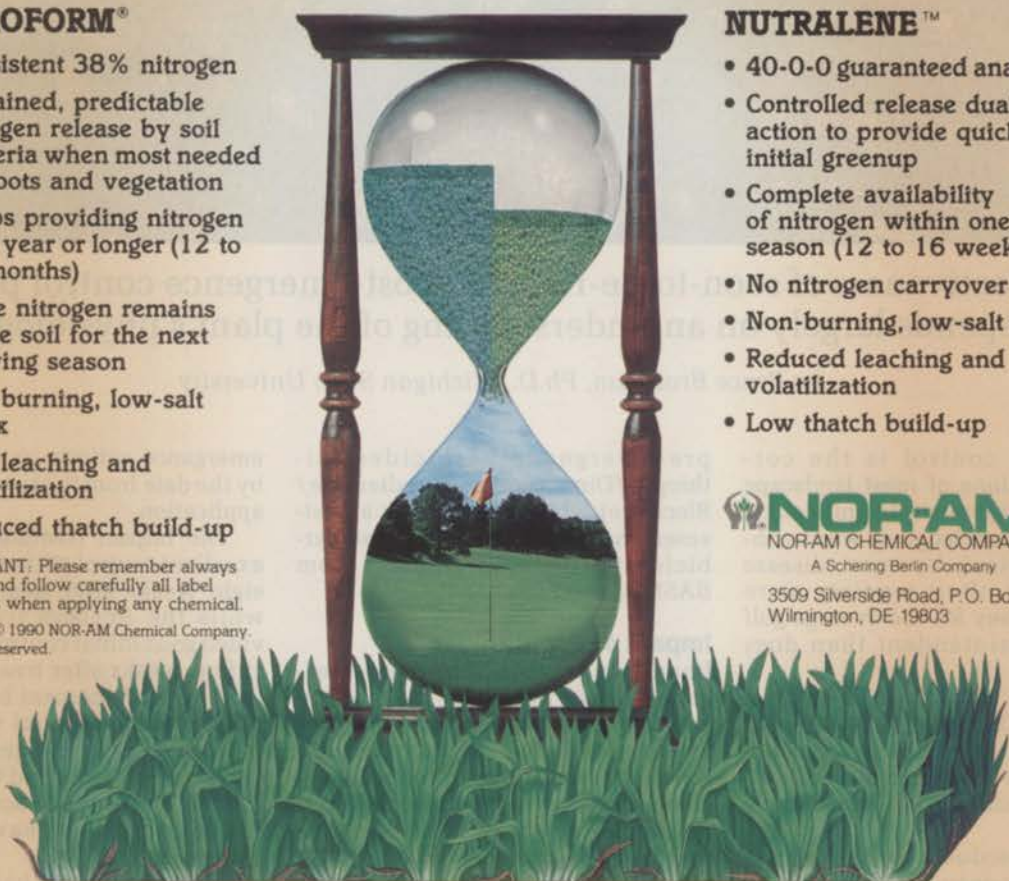
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POST-EMERGENCE WEED CONTROL IN COOL-SEASON GRASSES

The effectiveness of soon-to-be-released post-emergence control products depends largely on an understanding of the plant's physiology.

by Bruce Branham, Ph.D., Michigan State University

Weed control is the cornerstone of most landscape management. In golf course operations, knowledge of weed control is important; however, disease management often requires more time and money for the average golf course superintendent than does weed control.

Regardless of the type of turf you manage, it is important to understand weed control principles, so that the decisions you make are economical, environmentally sound and produce good results.

No new products for post-emergence weed control in cool-season grasses have been introduced in the past year, although we are still waiting on the EPA to approve three turf herbicides. Two of those products are

pre-emergence herbicides (di-thiopyr/Dimension and proflaminate/Blockade) while the other is a post-emergence grass and broadleaf herbicide (quinclorac/Impact) from BASF Ag products.

Impact of Impact

Impact is an excellent post-emergence grass herbicide with good activity on a number of broadleaf weeds as well. Data in Table 1 shows the effectiveness of this product when compared to other commonly used post-emergence grass herbicides. Impact controls crabgrass effectively at all growth stages and quickly by providing rapid initial burndown of the crabgrass. Impact also has some rapid initial burndown of the crabgrass. Impact also has some pre-

emergence activity as demonstrated by the date from the two- to three-leaf application.

The Impact treatments provided excellent control (99 to 100 percent) at eight weeks after treatment (WAT), while the Acclaim treatment provided good initial control—87 percent at four weeks after treatment, which fell to only 51 percent by eight WAT.

This loss of control with Acclaim indicates that new germination of crabgrass had occurred to reinfest the treated area which occurs because Acclaim does not have pre-emergence activity.

Evidently, Impact had enough pre-emergence activity to provide control for the rest of the growing season. However, applications of Impact applied at the normal time for a pre-

TABLE 1. Effect of Impact on post-emergence crabgrass control in Kentucky bluegrass turf.

Treatment	Rate (lbs AI/A)	% Control	
Growth Stage: 2-3 leaf Appl. date: 6-14-90			
		<u>4 WAT</u>	<u>8 WAT</u>
Impact + BAS 090	0.75 + 1qt/A	100 a	99 ab
Impact + BAS 090	1.0 + 1qt/A	100 a	100 a
Dimension	0.38	90 a-d	94 a-c
Acclaim	0.18	87 a-e	51 d-h
Control		0	0
Growth Stage: 2-3 tillers Application Date: 7-10-90			
		<u>4 WAT</u>	<u>9 WAT</u>
Impact + BAS 090	0.75 + 1qt/A	100 a	97 ab
Impact + BAS 090	1.0 + 1qt/A	100 a	100 a
Acclaim	0.18	96 a-d	77 b-d
Daconate 6	2 + 2	93 b-d	88 a-d
Dimension	0.38	72 ef	82 a-d
Control		0	0

emergence herbicide have not given season-long crabgrass control. Impact has also been shown to provide effective control of broadleaf weed species such as white clover, black medic, field bindweed, spurge, and some veronica (speedwell) species.

Currently available herbicides for post-emergence control are shown in Table 2. Impact is not expected to be available until at least 1992.

Dimension's residual

Dimension is an excellent pre-emergence herbicide. But as the data in Table 1 shows, it also has excellent early post-emergence crabgrass activity. However, Dimension's ability to control crabgrass falls off rapidly after crabgrass starts producing tillers.

Formulations of MSMA provide effective weed control if two applications spaced 10 to 14 days apart are made. This product has fallen out of favor with lawn care operators because of the necessity to make repeat applications and because the potential for turf injury is high.

Acclaim: the standard

Acclaim is still the standard to which other post-emergence crabgrass herbicides are compared.

This product will provide very effective crabgrass control when applied on crabgrass with four tillers or less. As crabgrass grows beyond four tillers, control declines. In addition, crabgrass that is drought stressed is

poor quality turf areas. In this situation, Roundup would be applied to the entire area; a seven-day waiting period should be sufficient to kill all vegetation. The area can then be re-established to a more desirable turf species. Non-selective herbicides are useful for edging around trees to prevent mower damage to the trees and for controlling weeds in the cracks of sidewalks, where it is often combined with a pre-emergence herbicide such as Surflan to provide long-term residual weed control. Non-selective herbicides can also be used to control weeds in mulched planting beds or gardens by directing the spray only on the weeds present.

Paraquat, a non-selective contact post-emergence herbicide, does not translocate. It kills only vegetation that it comes in contact with. Thorough spray coverage is required to achieve good control, but because the herbicide does not translocate, it will only kill the green vegetation of the plant. Some plant species can regenerate from the surviving roots and meristems. In addition, paraquat is moderately toxic, with an LD₅₀ of 120 mg/kg.

Roundup is translocated throughout the plant. The LD₅₀ of Roundup is 7200 mg/kg and is classified as almost non-toxic. Both Roundup and paraquat are inactivated once they contact the soil surface, so reseeding operations can begin very shortly after application.

also more difficult to control with Acclaim, although this is generally true of all herbicides.

Few non-selectives

The list of herbicides available for non-selective weed control is a short one. Non-selective herbicides are used to control all vegetation and therefore are not normally used in a turf weed control program. These are, however, useful in a variety of situations.

Non-selective herbicides such as Roundup are used to renovate

TABLE 2. Post-emergence broadleaf weed control herbicides used in turf.

2,4-D	- 2,4-dichlorophenoxy acetic acid
2,4-DP	- 2-(2,4-dichlorophenoxy) propionic acid
MCPA	- 2-methyl-4-chlorophenoxy propionic acid
MCPP	- 2-(2-methyl-4-chlorophenoxy) peopionic acid
dicamba	- 3,6-dichloro-o-anisic acid
triclopyr	- 3,5,6-trichloro-2-pyridinyloxy acetic acid
clopyralid	- 3,6-dichloro-2-pyridine carboxylic acid

Some commonly used broadleaf herbicide mixtures and the ratio of each product in the mix:

2,4-D + MCPP

2 plus 2 (1/1) Fermenta
Lescopar (1/2) Lesco
2,4-D-MCPP (2/1) Cleary's

2,4-D + dicamba

Phenaban 801 (8/1) Gordons
Eight-one selective herbicide (8/1) Lesco
Riverdale 81 selective weed killer (8/1) Riverdale
Riverdale 101 weed killer (10/1) Riverdale

2,4-D + MCPP + dicamba

Three way selective herbicide (1/0.5/0.009) Lesco
Trimec (1/0.5/0.1) Gordons
Trimec Bentgrass Formula (0.3/1/0.13) Gordons
Trexan (1.0/0.53/0.13) (Sierra)
Trexam Bent (0.3/1.0/0.13) (Sierra)

2,4-D + 2,4-DP

Chipco Weedone DPC ester (1/1) Rhone-Poulenc
Chipco Weedone DPC Amine (1/1) Rhone-Poulenc
Turf D + DP (1/1) [ester] Riverdale

2,4-D + 2,4-DP + MCPP

Weedestroy Triamine (1/1/1) Riverdale
Weedestroy Triester (80.7/1.0/0.7) Riverdale

MCPA + MCPP + 2,4-DP

Weedestroy Triamine II (1/1/1) Riverdale

MCPA + MCPP + dicamba

Trimec Encore (1.0/0.46/0.1) [amine] Gordons

2,4-D = 2,4-DP = dicamba

Super Trimec (1.0/1.0/0.25) [ester] Gordons

2,4-D = triclopyr

Turfllon D (2/1) [ester] Dow
Turfllon II (2.6/1) [amine] Dow

triclopyr + clopyralid

Confront (3/1) [amine] Dow

Broadleaf options

The list of currently available post-emergence broadleaf herbicide combinations has not changed appreciably from last year. In post-emergence broadleaf weed control, manufacturers tend to sell mixtures of two to three herbicides. Thus, when you are applying an herbicide for post-emergence broadleaf weed control, you are usually using at least two different herbicide products.

The only single herbicide product currently sold is MCPP, which has excellent safety on bentgrass and for that reason is used by many golf courses

TABLE 3. Post-emergence grass and sedge control herbicides.

Common Name	Trade Name	Manufacturer
MSMA	Daconate 6	Fermenta
	Drexar 530	Drexel
	MSMA 6.6	Drexel
DSMA	DSMA Liquid	Riverdale
	DSMA Liquid	Drexel
	Methar 30	W. A. Cleary
AMA	Broadside, DSMA 81%	Vertac
	Super Methar	W. A. Cleary
fenoxaprop	Acclaim	Hoechst-Roussel
bentazon (sedges only)	Basagran	BASF

Esters and amines

Ester and amine control products have different herbicidal properties which are important to know. Amines are soluble in water; esters are oil-soluble. Esters are generally better herbicides than the corresponding amine product. Esters tend to penetrate into the leaf more effectively than do amines.

The reason that esters are not used exclusively is that they are slightly volatile. This volatility can result in non-target injury to susceptible plants in the landscape. Amines, on the other hand, are non-volatile but not as good as herbicides as the esters.

Thus, you use an amine to avoid the risk of injury that comes when you use an ester. Amines should always be used in the spring when plant material is breaking dormancy, actively growing, and very susceptible to these broadleaf herbicides. Esters can and should be used in the summer when weeds are starting to harden off and are less susceptible to the herbicide, and in the fall when non-target plants are hardening off for the winter and are much less susceptible to injury from volatile broadleaf herbicides.

Effectiveness principles

The factors affecting post-emergence weed control are:

- spray deposition;
- absorption;
- translocation.

Spray deposition and retention are very important factors in getting good post-emergence weed control. Several factors are important in deter-

mining spray intention, including spray volume, surface tension of the spray solution, the angle of the leaf and the composition of the cuticle.

Higher sprayer volumes tend to generate larger spray droplets which often may not be retained on leaves. Low spray volumes produce smaller droplets which are more readily retained by plant leaves. However, production of smaller droplets increases the likelihood of the spray drifting onto non-target plants.

Spray solutions with high surface tensions, such as water, may bounce off the leaf surface at impact. Spray solutions that have very low surface tensions may run off the leaf surface and result in little spray retention. Thus, an intermediate surface tension is desirable.

Leaf movement

Nyctinasty is the folding movement of leaves with decreasing light intensity and unfolding with increasing light intensity. Nyctinasty could result in decreased weed control from early morning or late evening applications due to a decrease in spray retention by weed species showing this kind of leaf movement.

Another factor which affects spray retention is the composition of the cuticle. The cuticle refers to a layer of wax, cutin and pectin deposited on the leaf surface. The more lipophilic

TABLE 4. Difficult to Control Broadleaf Weeds

Weed Problem	Herbicide	Comments
Wild violets (viola spp.)	Turflon	Very difficult to control; usually requires follow-up application 1 to 4 weeks after first application.
	Turflon D	
	Turflon II	
	Weedone DPC Super Trimec	
Creeping speedwell (veronica filiformis)	Dacthal 75 WP	Dacthal is an effective control, as are other products listed. There are 12 other speedwell species and difficulty of control varies. These are beginning to become serious turf weed pests.
	Dacthal 6F	
	Turflon D	
	Super Trimec Weedone DPC	
Ground ivy (Glechoma hederacea)	Turflon D	Very difficult to control in summer.
	Super Trimec	
	Weedone DPC	
Spurge (supina)	Same as above plus Dacthal, PreM, Team	Can control with spring Euphorbia applications of preemergence herbicides.
Oxalis (stricta)	Same as above except Dacthal	Can control with spring Oxalis applications of preemergence herbicides.
Prostrate knotweed (Polygonum aviculare)	Same as ground ivy	Difficult to control in summer.

(i.e. waxier) the leaf surface, the more difficult it is to retain water droplets.

Caution with surfactants

Some applicators always add a wetting agent to a herbicide to improve performance. However, this practice is not advised since unexpected results often occur. For starters, most herbicide manufacturers have some kind of wetting agent in their formulation and you don't need to add one.

The label will tell you under what conditions to add a surfactant. For instance, the Acclaim label suggests adding a wetting agent when the crabgrass is under drought stress. Based on the above discussion, one can see that always adding a wetting agent to Acclaim could result in unacceptable injury to the turf by increasing the absorption of the herbicide to phytotoxic levels under non-drought conditions. Thus, always follow label recommendations. **LM**

Dr. Branham is an associate professor in the Crop and Soil Sciences Department at Michigan State University.

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PRICING FOR PROFIT II

Break out your calculators! In Part II, the author explains different methods of pricing based on targeted return on investment.

by Travis Phillips, Ph.D.,
Mississippi State University

The "targeted return on investment" approach to pricing provides a means for allocating overhead. It is based on beginning with pricing to meet a targeted return on investment (ROI).

The procedure provides an estimate that covers all costs including overhead plus the pre-selected return on equity. The procedure has been widely supported by the Association of Landscape Contractors of America (ALCA). Broader and more varied applications are presented by Tucker in his book "Pricing for Higher Profits." Although the procedure is no cure-all, it does provide a framework for using already available accounting data.

Projecting income

In order to get a specific price based on ROI, the income statement for the year ahead must first be projected. This is necessary in order to arrive at the price based on conditions when the service will be performed.

For a business engaged only in landscape construction, landscape maintenance, or retail nursery sales, departmental accounting is probably not worthwhile. However, since many horticulturally-related businesses offer all these products and services, I shall assume a three-activity firm.

The basis for projecting the income statement is the previous year's income statement, being sure to consider coming trends. If the previous year was abnormal, adjustments will be necessary.

Table 1 reflects the income statements for contracting and merchan-

dising. The contracting department (landscape construction) was chosen for detailed illustration purposes. However, the same analysis was applied to the service department (main-

tenance) and merchandising (garden center).

Begin the process of projecting the next year's income statement based on a targeted ROI by re-classifying items on the income statement for the previous year. The data in Table 2 are the classified cost items for the contracting department as shown in Table 1.

TABLE 1

Item	Department			Total
	Contract	Service	Merchandise	
Sales	\$292,011	\$90,849	\$175,702	\$558,562
Beginning invent.	32,273	5,691	32,608	64,881
Purchases	95,841		91,142	192,674
Ending inventory	36,250	5,691	31,034	67,284
Cost of goods	91,861		92,716	190,271
Gross Profit	200,147	85,158	82,986	82,986
Expenses				
Contracting Supp.	5,757			5,757
Vehicles	14,227	14,227	1,000	29,454
Equipment rental	2,303			2,303
Salaries	109,605	51,054	46,610	202,269
Advertising	1,964		4,583	6,547
Repairs	1,341	1,340		2,681
Rent	7,174	1,000	4,026	12,200
Taxes-payroll	9,126	4,250	3,464	16,840
Taxes-property	1,332	184	743	2,259
Depreciation	10,355	7,141	357	17,853
Utilities	4,384	877	12,274	17,535
Dues & subscript.	474		475	949
Buying expenses	85		85	170
Credit card disc.	262		786	1,048
Pro. fees	5,444	158	286	5,888
Insurance	8,264	3,849	3,138	15,251
Office supplies	2,587	892	1,706	5,185
Net interest	3,051	1,052	2,012	6,115
Miscellaneous	554	191	364	1,109
Total expenses	188,289	86,215	76,909	351,413
Profit	11,289	(1,057)	6,077	16,878

Direct and overhead costs

Two major classifications are direct costs (those costs which are a direct function of the product or service) and overhead costs (those which do not vary with the volume of sales).

The overhead category is further divided into variable and fixed costs. Variable overhead costs fall between direct and overhead fixed. These costs vary somewhat in direct relationship to the volume of sales. If possible, this group of costs should perhaps be charged directly to the product or activity.

The data in Table 3 represent re-grouped data from Table 2. Costs of goods have been shifted from the accounting format to an item of direct costs.

Consider net worth

The next item of information needed is an estimate of the owner's equity—or net worth—for the next year.

Suppose balance sheet values have been assigned to the three departments the same way as the departmental income statements. Then, each department gets its pro rata share of equity based on book value of equity.

TABLE 2

CONTRACTING DEPT. : income statement for past year by classified costs				
Item	Direct Cost	Overhead Costs		Total
		Variable	Fixed	
Sales				\$292,011
Beginning invent.				32,273
Purchases				95,841
Ending inventory				36,250
Cost of goods				91,864
Gross Profit				200,147
Expenses				
Contracting Supp.		\$5,757		\$5,757
Vehicles	\$11,327		\$2,900	14,227
Equipment rental	2,303			2,303
Salaries	79,605		30,000	109,605
Advertising		1,964		1,964
Repairs		1,341		1,341
Rent			7,174	7,174
Taxes-payroll	6,426		2,700	9,126
Taxes-property			1,332	1,332
Depreciation			10,355	10,355
Utilities			4,384	4,384
Dues & subscript.			474	474
Buying expenses		85		85
Credit card disc.		262		262
Professional fees		0	5,444	5,444
Insurance		4,524	3,740	8,264
Office supplies		2,587		2,587
Net interest			3,051	3,051
Miscellaneous		554		554
Total expenses	99,661	17,074	71,554	188,289
Profit				11,858

Equity then needs to be adjusted to current market value so that the selected return is comparable to the best possible earnings on this sum of money if it were invested elsewhere.

Suppose that the book value of the equity in the contracting department is \$95,000. However, some assets appreciated, some fully depreciated. A conservative estimate of market value of equity is assumed to be \$120,000.

Add previous year data

After estimating equity for the next year, data for the previous year are used along with budgeted fixed costs and targeted profit to find the sales to sustain fixed cost and profits. The historical relationship for direct costs and variable overhead, along with the projected fixed overhead and profit, generate the projected income statement.

Suppose that we select a 15 percent ROI as a goal. Profit then would be estimated at:

$$\$120,000 \times .15 = \$18,000$$

Fixed costs last year were \$71,554 and are expected to increase by 12 percent next year:

The total percent of sales figure is called the marginal ratio, or the

TABLE 3

CONTRACTING DEPARTMENT: Income statement for past year			
Item	Dollars	Percent of Sales	
Sales	292,001	100.00	
Direct costs			
Cost of goods (materials)	91,864		
Vehicles	11,327		
Equipment rental	2,303		
Labor	79,605		
Labor burden	6,426		
Total direct	191,525	65.59	
Overhead costs			
Variable			
Contracting supplies	5,757		
Advertisement	1,964		
Repairs	1,341		
Buying expense	85		
Credit card discounts	262		
Insurance	4,524		
Office supplies	2,587		
Miscellaneous	554		
Total variable	17,074	5.85	
Fixed			
Vehicle insurance	2,900		
Administrative salaries	30,000		
Salary burden	2,700		
Rent	7,174		
Property tax	1,332		
Depreciation	10,355		
Utilities	4,384		
Dues and insurance	474		
Professional fees	5,444		
Insurance	3,740		
Interest	3,051		
Total fixed	71,554	24.50	
Total overhead	88,628	30.35	
Net profit	11,858	4.06	

	\$71,554 x 1.12 = \$80,140	
Profit plus fixed costs to be covered are:	\$18,000 ROI	
	80,140 Fixed cost	
	\$98,140 Total	
From the previous year's records, we find the following:		
	DOLLARS	% of sales
Fixed cost	71,554	24.50
profit	11,861	4.06
		28.56

amount of each dollar needed to cover fixed costs and profit. If these percentages of sales reflect trend, we use the marginal ratio in the next step. If not, we use a trend line to arrive at a representative value.

We now have the basis for completing the next year's income statement (Table 5). Direct cost items are increased by the same percentage amount that sales for the next year are projected to increase above sales for the previous year. Variable overhead

TABLE 4

CONTRACTING DEPT. : Projected income statement for next year by classified costs				
Item	Dollars	Percent of Sales Exposure		
Sales	343,627	100.00		
Direct costs				
Cost of goods (mat.)	108,105			
Vehicles	13,329			
Equipment rental	2,710			
Labor	93,679			
Labor burden	7,562			
Total direct	225,385	65.59	100.00	
Overhead costs				
Variable				
Contracting supp.	6,778			
Advertisement	2,312			
Repairs	1,579			
Buying expense	100			
Credit card disc.	309			
Insurance	5,326			
Office supplies	3,046			
Miscellaneous	652			
Total variable	20,102	5.85	8.92	
Fixed				
Vehicle insurance	3,248			
Admin. salaries	33,600			
Salary burden	3,024			
Rent	8,035			
Property tax	1,492			
Depreciation	11,597			
Utilities	4,410			
Dues and subsc.	531			
Professional fees	6,097			
Insurance	4,189			
Interest	3,417			
Total fixed	80,140	23.32	35.56	
Tot. overhead	100,242	29.17	44.48	
Net profit	18,000	5.24		

Sales required to meet the targeted ROI
Budgeted Fixed Cost + Profit
Marginal Ratio
\$80,140 + \$18,000 = \$343,627
.2856

costs are expected to maintain the same proportional relationship as for the previous year. Since fixed overhead costs were projected to increase by 12 percent over the previous period, each cost item in this group is multiplied by 1.12. Profit is the goal of \$18,000.

Subtotals

Next, the subtotals of costs are first calculated as a percent of sales. Of course, direct and overhead variable costs maintain the same percentage relationship to sales as for the previous year unless adjustments were made in the marginal ratio. Overhead fixed and total overhead costs and profits as a percent of sales change

TABLE 5

SERVICE DEPT. : Income statement for past year by classified costs				
Item	Direct Cost	Overhead Costs		Total
		Variable	Fixed	
Sales				\$90,849
Purchases				5,691
Cost of gds.				5,691
Gross Profit				85,158
Expenses				
Vehicles	\$11,327		\$2,900	\$14,227
Salaries	41,054		10,000	51,054
Repairs		\$1,340		1,340
Rent			1,000	1,000
Taxes-payroll	3,400		850	4,250
Taxes-prop.			184	184
Depreciation			7,141	7,141
Utilities			877	877
Pro. fees			158	158
Insurance		1,508	2,341	3,849
Office supp.		892		892
Net interest			1,052	1,052
Misc.		191		191
Total exp.	55,781	3,913	26,503	86,215
Net profit				(1,057)

from the values of a year earlier.

A new column called percent of exposure is added. These are calculated as a percentage of total direct costs. This value means that total direct costs must be marked up nearly 44.5 percent in order to break even if about \$343,600 in sales are achieved.

An example

Let's examine the procedure used to reach a bid price which meets the goal of 15 percent ROI.

Suppose the proposed job contains \$10,000 of direct costs (materials, labor, etc.).

Overhead mark-up to direct job cost:

$\$10,000 \times 1.4448 =$ breakeven price

Target price = profit + breakeven

Target price - profit = breakeven

Profit may be expressed as target price \times profit as percent of sales

which in this case is 5.24 or .0524.

Substituting, we get:

Target price - .0524 target price = breakeven

.9476 target price = breakeven

Target price = breakeven/.9476

$\$14,448 / .9476 = 15,247$

Check:

$\$15,247 - \$14,448 = \$799$

$\$799 / 15,247 = 5.24\%$

Alternative: (Adjust exposure factor for profit)

$1.4448 / .9476 = 1.5247$

Illustrating with the job containing

\$10,000 direct costs:

$\$10,000 \times 1.5247 = \$15,247$ target

price

TABLE 6

SERVICE DEPARTMENT: Income statement for past year			
Item	Dollars	Percent of Sales	
Sales	90,849	100.00	
Direct costs			
Cost of goods	5,691		
Vehicles	11,327		
Labor	41,054		
Labor burden	3,400		
Total direct	61,472	67.66	
Overhead costs			
Variable			
Insurance	1,508		
Office supplies	892		
Repairs	1,340		
Miscellaneous	191		
Total variable	3,931	4.33	
Fixed			
Vehicle insurance	2,900		
Admin. salaries	10,000		
Salary burden	850		
Rent	1,000		
Property tax	184		
Depreciation	7,141		
Utilities	877		
Professional fees	158		
Insurance	2,341		
Interest	1,052		
Total fixed	26,503	29.17	
Total overhead	30,434	33.55	
Net profit	(1,057)	(1.16)	

Material	\$5,000
Labor & other direct costs	5,000
	10,000
$\$10,000 \times 1.5247 =$	\$15,247

Adjustment:	
Material	$\$5,000 \times 1.20 = \$6,000$
Labor, etc.	$5,000 \times y = 9,247$
	15,247
	$\$5,000y = \$9,247$
	$y = 1.8494$
$\$15,247 - 6,000 =$	9,247

Material markup fixed

Often it is not possible to markup some of the materials to achieve the firm's goal. When this is the case, other direct costs must be marked up more to compensate.

Suppose we have the following situation:

However, materials can only be marked up 20 percent instead of the 52.47 percent needed for targeted profit.

Therefore, labor and other direct costs must be marked up by 1.8494 instead of 1.5247 when they carry equal weights in total direct costs.

TABLE 7

SERVICE DEPT. : Projected income statement for next year by classified costs			
Item	Dollars	Percent of	
		Sales	Exposure
Sales	132,750	100.00	
Direct costs			
Cost of goods	8,316		
Vehicles	16,551		
Salaries	50,988		
Labor burden	4,968		
Total direct	98,823	66.67	100.00
Overhead costs			
Variable			
Insurance	2,204		
Office supplies	1,303		
Repairs	1,958		
Miscellaneous	279		
Total variable	5,744	4.33	6.39
Fixed			
Vehicle insurance	3,248		
Admin. salaries	11,200		
Salary burden	952		
Rent	1,120		
Property taxes	206		
Depreciation	7,998		
Utilities	982		
Pro. fees	177		
Insurance	2,622		
Interest	1,178		
Total fixed	29,683	22.36	33.05
Tot. overhead	35,427	26.69	39.44
Net profit	7,500	5.65	

		% of sales
Fixed cost	\$26,503	29.17
Profit	(1,507)	(1.16)
		28.01

The service department

The past year's income data are contained in Tables 5 and 6.

Next year's income statement was projected on basis of a 15 percent return on equity with a market value of \$50,000. Fixed costs in the department were also expected to increase by 12 percent.

Since profits in the previous year were negative, the negative value is used in calculating the marginal ratio:

Sales for the next year were projected as $\$132,750 = (\$29,683 + 7,500) / .2801$. The next year's income statement is contained in Table 7.

Another strategy often used in pricing results when one item of direct costs greatly dominates, or when a major cost item such as labor maintains a fixed relationship to the other direct costs. When this is the case, this key factor may be used for bidding or pricing rather than using all direct costs.

The 1.4779 is multiplied by the ap-

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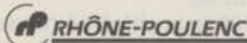
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TABLE 8

MERCHANDISING DEPT. : Income statement for past year by classified costs				
Item	Direct Cost	Overhead Costs		Total
		Variable	Fixed	
Sales				\$175,702
Begin. inventory				32,608
Purchases				91,142
Ending inventory				31,034
Cost of goods				92,716
Gross Profit				82,986
Expenses				
Vehicles	\$800		\$200	\$1,000
Salaries	31,610		10,000	41,610
Advertising		\$4,583		4,583
Rent			4,026	4,026
Taxes-payroll	2,614		850	3,464
Taxes-property			743	743
Depreciation			357	357
Utilities			12,274	12,274
Dues & subsc.			475	475
Buying expenses		85		85
Credit card disc.		786		786
Professional fees			286	286
Insurance		1,509	1,629	3,138
Office supplies		1,706		1,706
Net interest			2,012	2,012
Miscellaneous			364	364
Total	35,024	9,033	32,852	76,909
Profit				6,077

For example, we shall use labor:

Sales		\$132,750
Direct costs	\$8,316	
Cost of goods	16,551	
Vehicles	59,988	
Labor	4,968	
Labor burden	89,823	
Total direct	5,744	
Overhead-variable	29,683	
Overhead-fixed		\$125,250
Total costs		\$7,500

For example, we shall use labor:

$$\frac{\text{Total Direct + Overhead + Profit}}{\text{Total Direct}} = 1.4779$$

appropriate total direct cost for the price of the job. However, only labor (labor cost) may be used:

$$\frac{\text{Total direct + overhead + profit}}{\text{Labor}} = 2.2129$$

Thus, the markup is 2.2129 times direct labor instead of using total and direct cost.

Merchandising department

Tables 8 and 9 contain the data for the previous year for the merchandising department. Profit for the year ahead was projected as 15 percent on an equity with a current market value of \$80,000. Fixed costs were projected to increase by 12 percent.

In order to achieve the \$12,000 desired ROI, sales were projected at

TABLE 9

MERCHANDISING DEPARTMENT: Income statement for past year			
Item	Dollars	Percent of Sales	
Sales	175,702	100.00	
Direct costs			
Cost of goods (purchases)	92,716		
Vehicles	800		
Labor	31,610		
Labor burden	2,614		
Total direct	127,740	72.70	
Overhead costs			
Variable			
Advertisement	4,583		
Buying expense	85		
Credit card discounts	786		
Insurance	1,509		
Office supplies	1,706		
Miscellaneous	364		
Total variable	9,033	5.14	
Fixed			
Vehicle insurance	200		
Administrative salaries	10,000		
Salary burden	850		
Rent	4,026		
Property tax	743		
Depreciation	357		
Utilities	12,274		
Dues and insurance	475		
Professional fees	286		
Insurance	1,629		
Interest	2,012		
Total fixed	32,852	18.70	
Total overhead	41,885	23.84	
Net profit	6,077	3.46	

For example:

Sales		\$220,189
Direct costs		
Purchase	\$116,187	
Vehicles	1,002	
Labor	39,612	
Labor burden	3,276	
Total direct costs	160,077	
Overhead-variable	11,318	
Overhead-fixed	36,794	
Total costs		\$208,189
Profit		\$12,000

Using the total of direct cost:

$$\frac{\text{Total Direct + Overhead + Profit}}{\text{Total Direct}} = 1.3755$$

\$220,189 (Table 10).

This required a factor of 1.3006 markup on direct costs to breakeven or 1.3755 to cover all costs and profit. Rather than pricing merchandising at retail as a function of direct cost, a more common policy is to mark it up as a function of merchandise (purchase) cost.

For example:

The 1.3755 is multiplied times the appropriate total direct cost in order

TABLE 10

MERCHANDISING DEPT. : Projected income statement for next year by classified costs			
Item	Dollars	Percent of Sales	
		Exposure	
Sales	220,189	100.00	
Direct costs			
Cost of goods (purch.)	116,187		
Vehicles	1,002		
Labor	39,612		
Labor burden	3,276		
Total direct	160,077	72.70	100.00
Overhead costs			
Variable			
Advertisement	5,742		
Buying expense	106		
Credit card disc.	985		
Insurance	1,891		
Office supplies	2,138		
Miscellaneous	456		
Total variable	11,318	7.07	7.07
Fixed			
Vehicle insurance	224		
Admin. salaries	11,200		
Salary burden	952		
Rent	4,509		
Property tax	832		
Depreciation	400		
Utilities	13,747		
Dues and insur.	532		
Pro. fees	320		
Insurance	1,825		
Interest	2,253		
Total fixed	36,794	22.99	22.99
Tot. overhead	48,112	30.06	30.06
Net profit	12,000		

to ascertain the selling price. However, if only the merchandise (purchase price—cost of goods) cost is used:

$$\frac{\text{Total direct + overhead + profit}}{\text{merchandise (purchases)}} = 1.8951$$

Thus, the markup is 1.8951 times merchandise cost instead of total direct cost. However, usually at retail, the selling price is expressed in terms of markup from the selling price instead of the purchase price. The factor of 1.8951 to be multiplied by the purchase price may be converted to selling price basis (Table 11).

For example, an item which has a purchase price of \$1, with the above targeted markup would be priced by $\$1.0000 \times 1.8951 = \1.90 or $\$1.0000 / .5277 = \1.90 .

The asking price

Now that we have looked at alternative applications of arriving at the price, what price do we actually ask? Let's look at merchandise first because it is less complicated.

The targeted price is designed as the average realized by the department. Since some merchandise will

Table 11

Selling price = purchase price + markup	
Selling price - markup = purchase price	
Markup may be expressed as selling price x markup as a percentage of the selling price	
Selling price - markup % x selling price = purchase price	
Selling price (1 - markup %) = purchase price	
Selling price = purchase price / (1 - markup percent)	
In our example:	
Markup percent =	(Selling price - purchase price) / Selling price
	= (1.8951 - 1.0000) / 1.8951
	= .4723
Then,	= purchase price / (1 - .4723)
Selling price	= purchase price / .5277

be lost, damaged and marked down, the initial asking price should be adjusted upward. Also, competition may make it difficult to get a full markup on some items so that other items must compensate. In some cases the exact calculated price may not fit conventional pricing strategy.

For example, almost no one would price a product at \$10.51. So the calculated target price should merely be a starting place for arriving at the price finally used.

Adjusting the bid

How badly you want the job and the degree of competition influence the adjustment process. But how low and how high can you go?

Typically, we would say that on the low side, the bid should not be below variable or out-of-pocket cost. In the language we have been using, this would be all direct costs plus most of variable overhead costs. After all, in the short run, we are going to incur fixed overhead regardless of business volume.

At least two exceptions should be mentioned about the low price. In the case of contracting, for short periods of time it may pay to subsidize the labor cost in order to keep a valuable crew member. In merchandising we take whatever we can get for perishable merchandise such as Christmas trees at Christmas.

The higher bid

Consider at least two factors when bidding on the higher end of the spectrum: competition and the price/volume of business sales relationship.

For some products and services, a relatively high price sells fewer units but total sales are higher than if a lower price were charged.

On the other hand, when price is increased, the percentage decrease in quantity sold exceeds the percentage increase in price. In this case the price increase results in a decrease in total

sales.

If you have considerable competition and the services you offer are not particularly exclusive, the higher price may lead to lower total sales. In this case lower prices result in greater total sales. In this case knowing the price which meets your goal becomes especially important because you must, on average, meet your goal.

Weaknesses of price systems

All pricing systems have weaknesses, starting with the information put into

For some products and services, a relatively high price sells fewer units, but total sales are higher than if a lower price were charged for the service.

the system. Even though you may not have started with the information from your income statement for the previous year, expenses and cost allocations are relatively arbitrary. Depreciation may be used for the expected life of the item or may be based on the fast write-off system allowed in recent years.

The targeted ROI approach has much appeal because it provides a method of allocating overhead costs.

At least three warnings should be sounded:

1) Allocation of many costs among categories is somewhat arbitrary. Many cost items have some elements of more than one category.

2) The method works only if realized sales are in the vicinity of that amount projected. If you come up short, overhead costs not covered comes from profits.

3) The method tends to place equal weight of overhead on each dollar of direct costs. Obviously, there are different demands on overhead for each job. Calculated bid priced may have to

be adjusted in order to be competitive, but if downward adjustments are made on some, upward adjustments must be made on others to be offsetting.

A time of competition

There is no magic formula for pricing landscape services. However, some methods which recognize that general overhead must be recovered do not necessarily tell you how to price a product or service to cover it. The targeted ROI has the appeal of making the allocation, but caution is needed in applying the technique.

Competition in providing landscape services is increasing as more firms enter the business. Those firms which price their services in accordance with their costs are likely to be those which survive. **LM**

(ED. NOTE: We hope this examination of pricing theories for landscape contracting has been helpful. Let us know what you think. If you have a pricing system that works for you, drop us a line. We'll publish your ideas in a future issue.)



Dr. Phillips is a professor/economist in the Department of Agricultural Economics at Mississippi State University. He has written numerous articles on the economics of crop and horticulture production, and has developed and presented marketing programs for Mississippi landscape management firms.

SURVIVING IN A TROUBLED ECONOMY III

Maintaining company strength during lean times requires attention to all labor, material and equipment costs.

by Ed Wandtke, AGMA, Inc.

During any time of economic stress, most green industry companies are apprehensive. To be prepared to handle any volume of service increase or decline in 1991, a company owner needs to examine how the company can vary its operation in either direction.

Likewise, a company must examine various financial issues which may effect it in 1991. Some financial planning will be necessary in anticipation of changing economic conditions.

Operations check

The three major costs a green industry company incurs are labor, materials and equipment.

Labor and materials are variable, and dependent on volume; equipment costs are fixed.

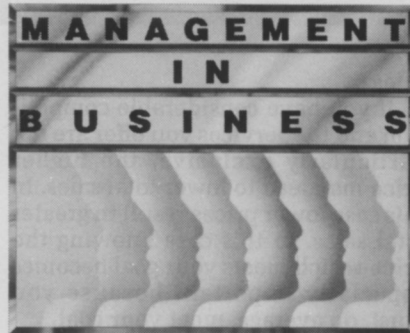
With increased fringe benefits and expected higher wages for older employees, a company owner must pay careful attention to the cost of adding, keeping or replacing employees.

Payroll options

This year offers many companies the opportunity to maintain last year's pay level since there will be more unemployment in the marketplace. The problem with this approach is that most people who can be hired at last year's level will be no better than current employees.

A better option: increase wages to attract a higher level of employee than you have had in the past. This will allow you to hire people who can handle more decision-making challenges on the spot in the field. This will give you time to improve customer retention or work on prospecting.

If you do not have a system in your company to measure and track employee productivity, now is the time. Knowing production levels of each crew helps you determine which employees or crews are most effective. It may be surprising for you to learn that individuals or crews who always come back to the office late may not turn out to be the most efficient pro-



duction personnel. Knowing this data, you can determine what needs to be done to increase productivity or you may identify employees who have become complacent or inefficient in their work performance efforts.

Posting production data daily or weekly often puts indirect pressure on individuals performing under the company average to increase their efforts. It is amazing what peer pressure can do to help underachievers reach higher levels of performance, with minimal pressure from management.

Quality service performance

Tracking customer service calls, the reason for the call, and the technician or crew who serviced the property is another area which you need to be monitoring for 1991. This information will provide you with insight into service effectiveness and quality.

Quality control information needs to be tracked to increase customer satisfaction and evaluate individual employee's effectiveness in delivering a quality service. Monitoring also identifies patterns of product or equipment failure, when and if those patterns start to appear.

Inventory control

Materials are generally the second-highest expense category for companies operating in the lawn/landscaping or the design/build segments of the green industry.

This means that paying close attention to and monitoring these costs may improve profitability.

Unless you've already done so, 1991 is the year to pay close attention to materials usage. An inventory control system will increase profitability.

Comparing the actual product used to treat an area against label specifications is important. In 1990, many companies complained of ineffective products. Upon investigation, it was determined that a lower rate was used than that recommended by the manufacturer.

Dump stale equipment

Companies accumulate equipment. Look around your facility and identify what equipment has not been used in the past two years. If you don't use it, sell it now. Turn that dusty equipment into cash.

Standardize on only one or two types of equipment to reduce parts needed to maintain equipment. This will also make training new employees easier since there is less equipment to learn.

Evaluate your equipment to determine the type of properties you are now servicing. Your customer mix may have changed over the past three or four years. Look for trade-in deals and change your equipment to better match the current property needs.

Look at the books

If you are unable to determine the profitability of any service, you risk losing money on an increase in volume. Perhaps you have missed business in your pursuit of what turned out to be unprofitable services.

Offering fewer services will prove more profitable if your total lawn service volume comes under pressure.

Don't let the competitive pricing and your quest for higher volume cause you to sacrifice profit margins.

Advisory groups work

If you have not operated a business during tight economic conditions, now is the time to call on the experience of others.

Most owners have a group of people who advise them on the direction
continued on page 80

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QUICKIE-QUIZ

Post-emergence weed control

ED. NOTE: Answers to all questions can be found in this month's Post-emergence Weed Control Guides for Warm and Cool Season Grasses.

1. Unlike pre-emergence herbicides, post-emergence control products can be applied as "spot treatments" or on an "as needed" basis, directly to a weed infestation.
 - a. true
 - b. false
2. Even low rates of most post-emergence herbicides are harmful to newly-sprigged or sodded warm-season turfgrasses.
 - a. true
 - b. false
3. Which of the following have a good tolerance to MSMA and DSMA:
 - a. carpetgrass
 - b. centipedegrass
 - c. bermudagrass
 - d. St. Augustinegrass
4. Mowing schedules need to be coordinated with post-emergence herbicide applications. A general recommendation is to delay mowing:
 - a. one day before or after application
 - b. three to four days before or after application
 - c. 48 hours before application
5. Two applications of MSMA + Sencor are necessary to control goosegrass. The best interval is:
 - a. three to four days
 - b. five to seven days
 - c. two to three weeks
 - d. seven to 10 days
6. The tolerance of warm-season turfgrasses to post-emergence herbicides decreases at air temperatures greater than:
 - a. 75 degrees
 - b. 85 degrees
 - c. 90 degrees
7. Single applications at high rates generally cause more turfgrass injury than repeat applications at low rates.
 - a. true
 - b. false
8. The effectiveness of most post-emergence herbicides is better when rainfall or irrigation does not occur for _____ hours after application.
 - a. eight to 10
 - b. 10 to 12
 - c. six to 24
 - d. 48
9. Established dallisgrass can be controlled in bermudagrass or zoysiagrass with repeat applications of:
 - a. 2,4-D
 - b. Sencor
 - c. MSMA or DSMA
 - d. Image
10. _____ can be used in warm-season turfgrasses for yellow and purple nutsedge control.
 - a. DSMA
 - b. Sencor
 - c. 2,4-D + diclorprop
 - d. Image
11. Roundup is classified as a:
 - a. amine
 - b. ester
 - c. non-selective
 - d. surfactant
12. Why are amines most effective when used in the spring?
 - a. the price is low during spring
 - b. the product is less volatile
 - c. the weed is most susceptible to control
13. According to research, Dimension's ability to control crabgrass declines:
 - a. when the temperature rises
 - b. when tillers number four or more
 - c. under high humidity
 - d. when spray volume is low
14. Nyctinasty refers to:
 - a. A leaf's reaction to light
 - b. The ability of a plant to absorb chemicals
 - c. The chemical similarity between esters and amines
15. The LD₅₀ of Roundup is:
 - a. 5600 mg/kg
 - b. 7200 mg/kg
 - c. 1500 mg/kg
 - d. 4700 mg/kg
16. The more lipophilic the leaf surface:
 - a. The prettier it looks
 - b. the easier it is to apply chemicals
 - c. the more difficult it is to retain water droplets
 - d. the more resistant it is to disease

ANSWERS: 1.a; 2.b; 3.c; 4.b; 5.d; 6.c; 7.a; 8.c; 9.c; 10.d; 11.c; 12.c; 13.b; 14.a; 15. b; 16. c

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| 0010 <input type="checkbox"/> Sports complexes | 0060 <input type="checkbox"/> Military installations & prisons |
| 0015 <input type="checkbox"/> Parks | 0065 <input type="checkbox"/> Airports |
| 0020 <input type="checkbox"/> Rights-of-way maintenance for highways, railroads & utilities | 0070 <input type="checkbox"/> Multiple government municipal facilities |
| 0025 <input type="checkbox"/> Schools, colleges & universities | <input type="checkbox"/> Other type of facility (specify) _____ |
| 0030 <input type="checkbox"/> Industrial & office parks/plants | _____ |
| 0045 <input type="checkbox"/> Condominiums/apartments/housing developments/hotels/resorts | _____ |

B. CONTRACTORS/SERVICE COMPANIES/CONSULTANTS:

- | | |
|--|---|
| 0105 <input type="checkbox"/> Landscape contractors (Installation & maintenance) | 0135 <input type="checkbox"/> Extension agents/consultants for horticulture |
| 0110 <input type="checkbox"/> Lawn care service companies | <input type="checkbox"/> Other contractor or service (specify) _____ |
| 0112 <input type="checkbox"/> Custom chemical applicators | _____ |
| 0125 <input type="checkbox"/> Landscape architects | _____ |

C. SUPPLIERS

- | | |
|---|---|
| 0205 <input type="checkbox"/> Sod growers | <input type="checkbox"/> Other supplier (specify) _____ |
| 0210 <input type="checkbox"/> Dealers, distributors | _____ |

2. WHICH OF THE FOLLOWING BEST DESCRIBES YOUR TITLE? (Check only one)

- 10 EXECUTIVE/ADMINISTRATOR—President, owner, partner, director, general manager, chairman of the board, purchasing agent, director of physical plant
- 20 MANAGER/SUPERINTENDENT—Landscape/ground manager, superintendent, foreman, supervisor
- 30 GOVERNMENT OFFICIAL—Government commissioner, agent, other government official
- 40 SPECIALIST—Arborist, forester, architect, consultant, agronomist, pilot, instructor, researcher, horticulturalist, certified specialist
- 50 OTHER TITLED AND NON-TITLED PERSONNEL (specify) _____

Best-made tees: well-drained and roomy

There are two ways to "tee off" golfers: provide them with lush, spacious well-drained tees, or subject them to matchbook-sized tee surfaces with compacted soil.

Jim Latham sorta' thinks the former is the better way to go.

An agronomist with the USGA Green Section, Latham has seen the best and the worst the industry has to offer, and says the worst tees are brought about by a combination of poor cultural practices.

Start with drainage

Latham says that the best tees are well-drained, with a sand subsurface across the entire tee. "This way," he

Broken ball tees are a sure sign of rock-hard, compacted soil. Add water, ASAP.

explains, "as the tee is watered, moisture goes into the sand and off in all directions. The shoulders, made of heavier soil, direct water toward the drain tile.

"The better the drainage off the slopes," continues Latham, "the easier the slopes are to maintain" with heavy mowers or aerators.

Be on the lookout for more broken ball tees than usual; they're a sure sign of thirsty, rock hard soil.

Shift the wear around

When building tees, remember: the wider the tee, the easier it is to shift wear and tear from side to side as well as from front to back. This might be harder to do on No. 1, since that's usually the smallest tee on the course.

Latham quotes the USGA specs for tees: "for par 4 or 5 holes, we like to see about 100 square feet for every 1000 rounds played; with par threes, about 200 square feet per 1000 rounds. It takes that much space to keep up with the traffic over the long haul."

No trees on tees

Tees are for people. Large trees, when too close to tees, might just as well be weeds.

Especially, says Latham, with the cool-season grasses. They can't handle shade, traffic and competition for



Tees with lots of elbow room make it easier to control wear and tear from side to side and front to back.



Sand below the playing surface eliminates compaction, provides adequate tee drainage. Thicker soil on the slopes directs moisture towards the drain tile. Better drainage means easier mowing.

nutrients simultaneously.

If you suspect a root is robbing the turf of nutrients, but do not want to remove it, Latham recommends root pruning.

Let the poa alone

Latham takes a positive outlook when it comes to *Poa annua* on tees. If a tee has some poa established, says Latham, "why not capitalize on it, and give it hell. Over-water it, over-fertilize it, aerify it, do something with it."

Shrubby surrounding a tee might look good, but it's not considered a wise practice as it impedes air flow. "And without that air movement,"

says Latham, "we don't get evaporation. It's not giving the tee the necessary cooling effect," so important during warm weather.

Rye is recommended

Latham believes perennial ryegrass is "terrific" for cool-season tees.

"It comes up fast, produces well, can be cut at any height and looks pretty good if you seed them heavily enough."

When seeding new tees, Latham also recommends rolling the seed after it's put down to guarantee soil contact.

"It's such a simple thing," says Latham, "but so many times, a superintendent forgets to do it."

And don't forget to aerify.

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PRODUCTS

New mid-size rider full of finer features

From the Grasshopper Co. comes a new mid-size rider mower with 44- or 48-inch cutting decks and a variety of features.

Model 614 runs via a direct drive dual-hydrostatic system and dual levers for easy control. The model also boasts of zero-turning radius.

Among optional attachments are included an eight-cubic-foot grasscatching system, a 48-inch



multi-purpose dozer blade and a 48-inch snow thrower.

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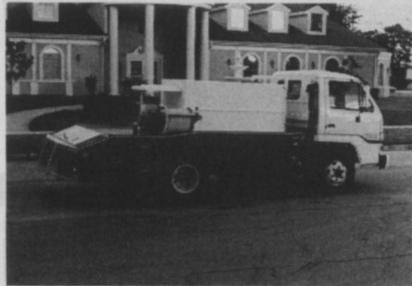
State-of-art spray truck now available

Neelco Industries, Inc. introduces its premier lawn spray truck line with its Premier model.

The truck, featured at the National Pest Control Convention in 1990, a 500-gallon baffled fiberglass holding tank and eight hp Wanna Hydra Cell pump.

The vehicle is designed for easy access to all valves including sight gauge for the drop tank, pressure gauge and the remote starter switch for the pump engine.

The vehicle comes equipped with



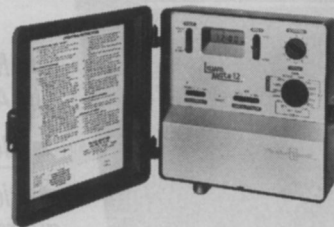
300 feet of half-inch hose spray mounted on the side and spooled on a Hannay electric reel. Neelco can custom build spray equipment to specifications.

Circle No. 192 on Reader Inquiry Card

Two irrigation system controllers proving popular

Weather-Matic Co. says its two new LawnMate Controllers are being well received by irrigation specialists. Don Thompson, director of Weather-Matic's marketing and sales department says operation ease is one reason for the good reception.

LawnMate Controllers feature a nine volt standard alkaline battery



which automatically turns on in the event of power failure. Programs and clock time are uninterrupted for a week with the back-up system.

Thompson says LawnMate installation time is lessened because a lower panel is removable allowing ac-

cess to the field wiring terminal block. The unit is equipped with keyhole mounting.

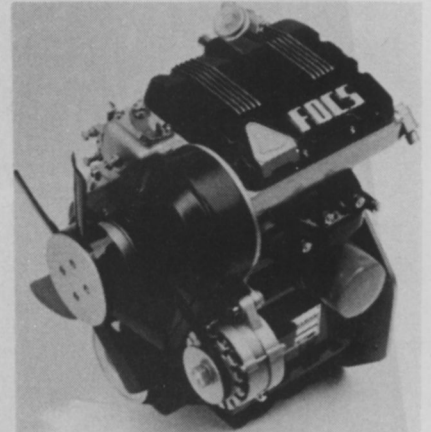
LCS information display includes time, date, watering days, program values and days of the week. Rocker switches are used for all programming.

Two models are designed for seven and 12 stations.

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and liquid-cooled models.

Liquid-cooled engines range from 10 to 48 hp; air-cooled models from four to 110 hp.

Lombardini says the engines, engineers for the construction industry, are backed by a nationwide distributor, dealer and service system.

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continued on page 70

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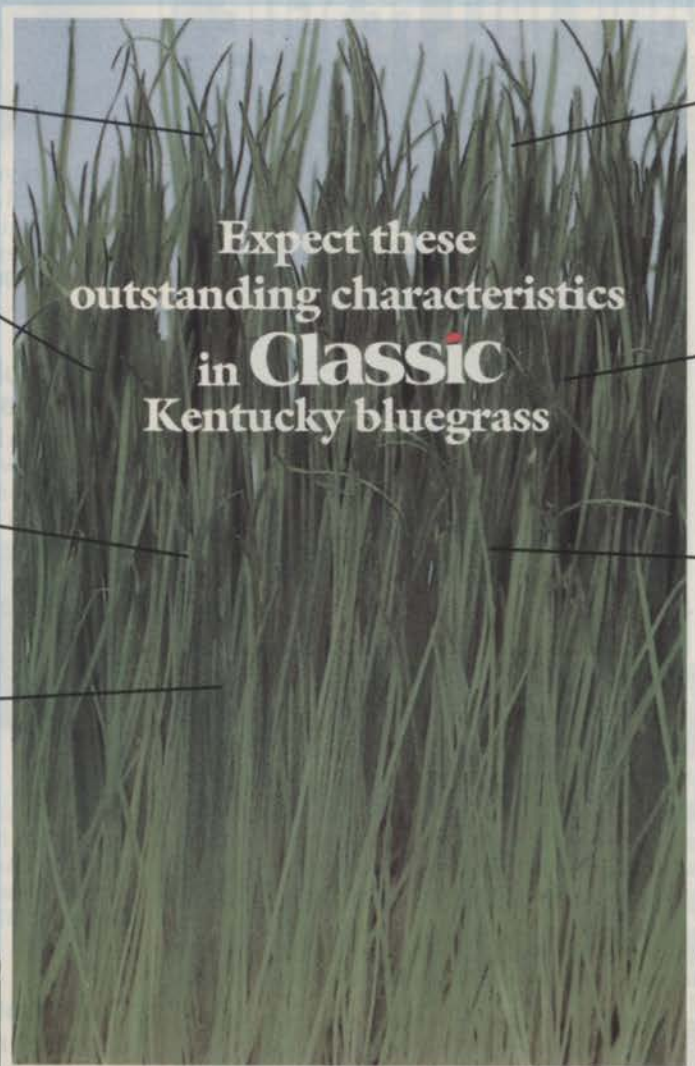
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Test reports indicate Classic's ability to produce a highly dense stand and excellent percent of living ground cover all year long.

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Classic demonstrates good resistance to leaf spot, crown rot and rust. Classic demonstrates resistance to stripe smut, snow mold, stem rust and Fusarium blight. Classic is tough.

BRIGHT, DEEP GREEN COLOR

Texture and color of Classic provide a handsome pleasing growth. Color is bright, deep green. Classic proves highly compatible in turf-seed blends. Classic is a sward of beauty.

UNIFORM & STABLE

Classic offers the genetic capability to remain true to the variety. Aberrant growth is extremely low. When you plant Classic, you get Classic.

EARLY GREEN-UP

Classic comes on strong in the spring with early green-up, retains its color well into the winter season.



Call or write your seed supplier.
Ask for Classic facts.

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PRODUCTS from page 68

Turf colorant now comes in tablet form

Becker-Underwood, Inc. now manufactures its popular Turf Mark colorant in tablet form.

The tablet is designed for use with most common backpack sprayers. Each tablet treats one to two gallons of spray solution. The tablets dissolve without agitation. Pond and fountain water may also be colored with the product.

The Turf Mark colorant mixes

well with all water soluble pesticides and fertilizers.

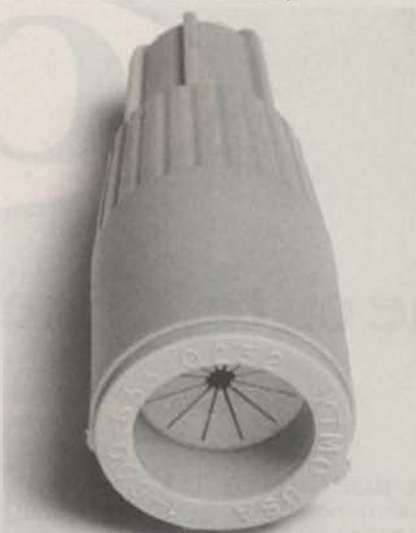
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New waterproof splicer simplifies electric joints

King Irrigation Products now offers a "one step" waterproof splicer which may be used on all low voltage systems where such a joint is desired.

Filled with a waterproof gel, the one-step wire connector can accommodate most common wire sizes from

three No. 22s to 4 No. 12s. King says use of the wire connector eliminates need for red, yellow, orange and blue or gray connectors. Once wires are passed through the cap, they are coated with a sealant. The connector is twisted for final sealing.



King says typical uses include residential and commercial outdoor lighting, fountains, waterfalls and marine and dock uses.

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Adjustable nozzle provides flexibility

The popular Toro Stream Rotor nozzle now comes in a more adjustable version, the company says.

The first adjustable Stream Rotor is



adjustable in the 16- to 30- foot range without changing nozzles. The new nozzle fits all bodies.

Circle No. 197 on Reader Inquiry Card

Clear bottle eases absorbent product use

From the Finn Corporation comes clear plastic bottle packaging of Hydro-Gel A 1000C; granules which soak up to 400 times their weight in water.

Finn says the plastic bottle also is equipped with a special shaker and pouring onto an affected area is an easy task.

continued on page 72

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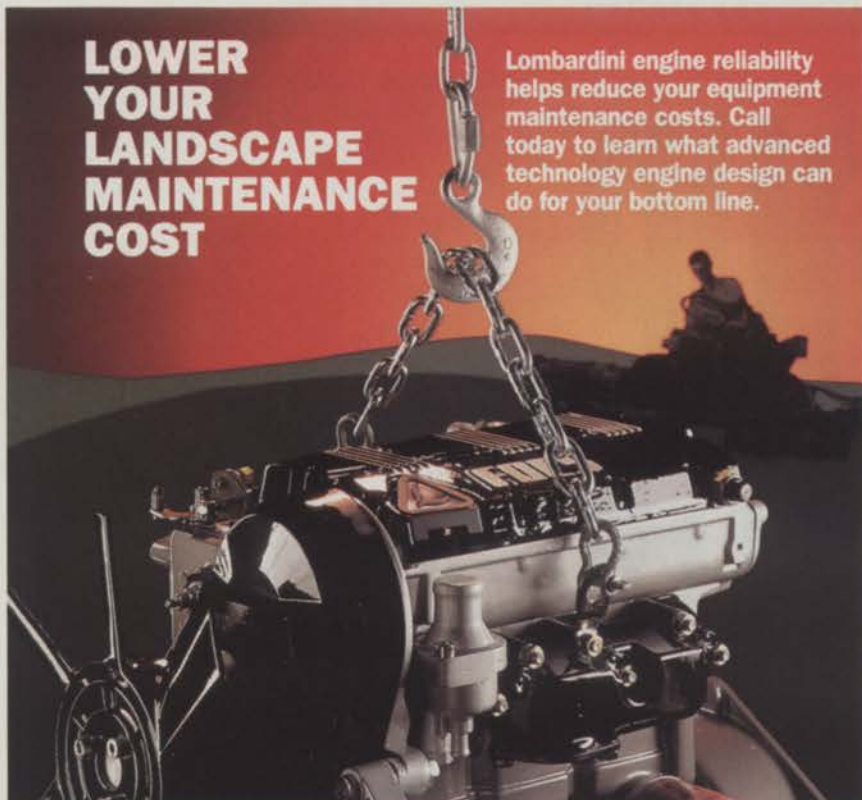
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Hydro-Gel A 10000C can assist in absorbing excess water from damp or saturated soil.

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Small area fixed sprinklers on market

Toro Co. now sells a new 570C series of fixed pop-up sprinklers in three-, four-, six- and 12-inch sizes. The series comes equipped with ratcheting
continued on page 78

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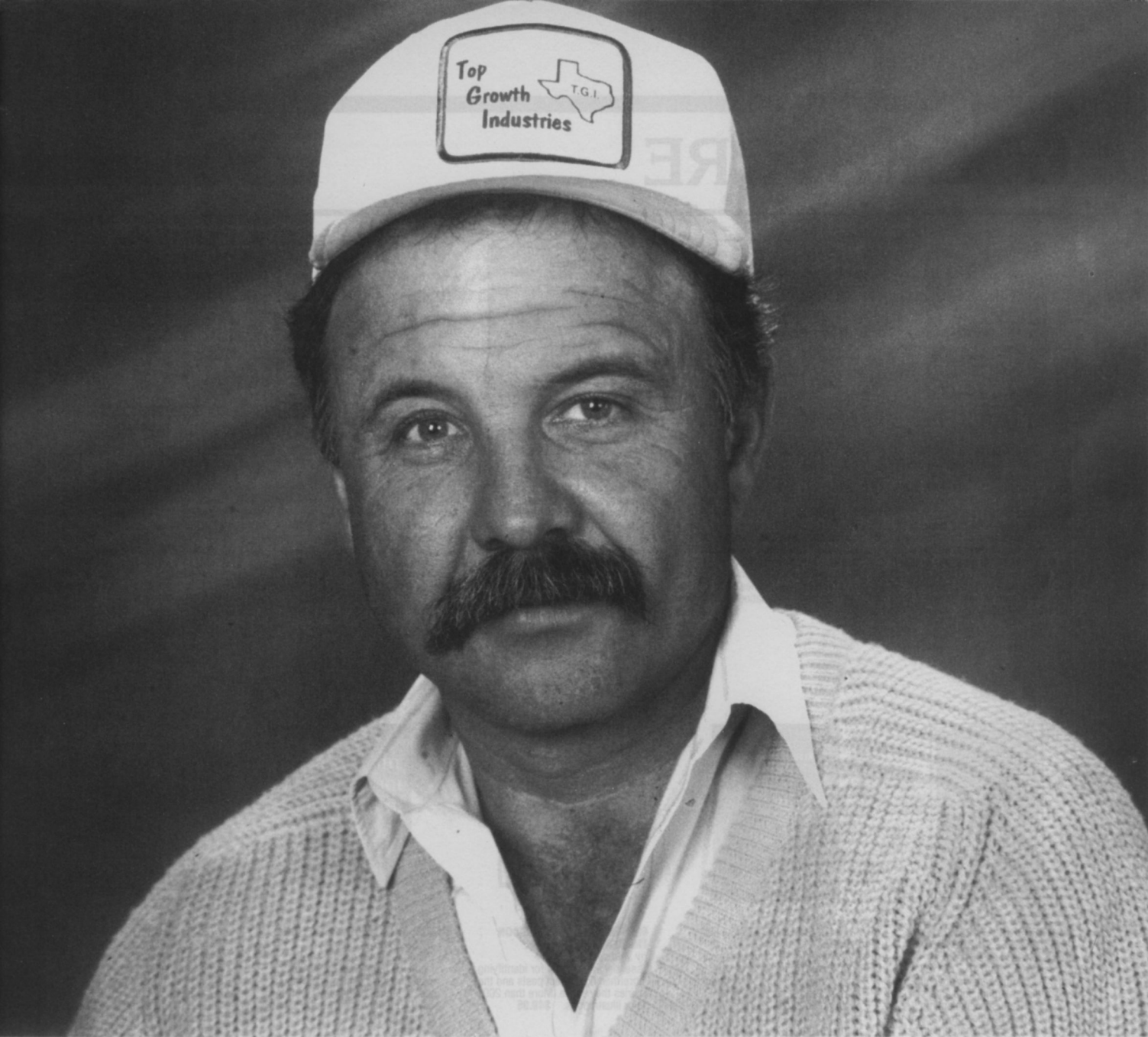


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Jay Cannon,
General Manager
Top Growth Industries
Houston, TX

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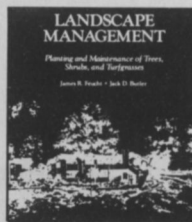
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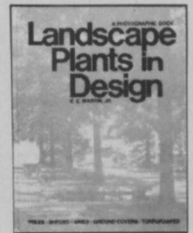
300 - LANDSCAPE DESIGN: A PRACTICAL APPROACH
by Leroy Hannebaum
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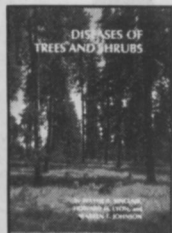
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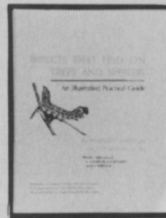
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by Edward C. Martin
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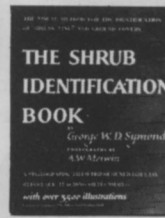
665 - ARBORICULTURE: THE CARE OF TREES, SHRUBS AND VINES IN THE LANDSCAPE
by Richard W. Harris
Provides comprehensive coverage of complete planting, site analysis, preparation and special planting methods, fully detailed coverage of fertilization, irrigation and pruning guidelines on preventative maintenance, repair and chemical control, how-tos of diagnosing plant problems, practical data on non-infectious disorders, diseases, insects and related pests and pest management. **\$63.00**



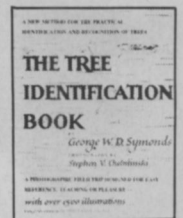
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A comprehensive pictorial survey of the diseases of, as well as the environmental damage to, forest and shade trees and woody ornamental plants in the United States and Canada. Reflects the most important developments in fungal biology and taxonomy, plant bacteriology, virology, and environmentally induced stress in plants. Summarizes information about newly discovered diseases and provides up-to-date accounts of old ones. **\$52.50**



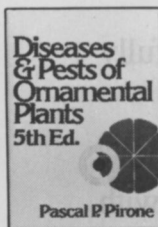
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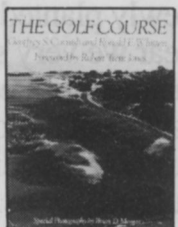
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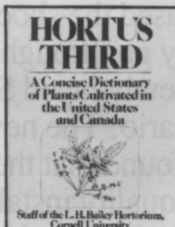
750 - TREE IDENTIFICATION
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Pictorial reference to identifying trees by checking leaves, buds, branches, fruit and bark. Like its sister publication, SHRUB IDENTIFICATION, popular and botanical names are listed with index tabs for easy reference. **\$17.95**



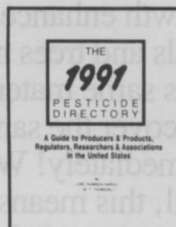
410 - DISEASES & PESTS OF ORNAMENTAL PLANTS
by Pascal Pirone
This standard reference discusses diagnosis and treatment of diseases and organisms affecting nearly 500 varieties of ornamental plants grown outdoors, under glass or in the home. Easy to understand explanations of when and how to use the most effective fungicides, insecticides and other control methods. **\$49.95**



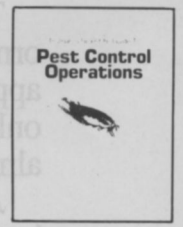
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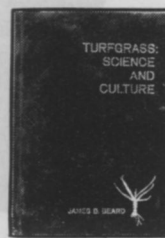
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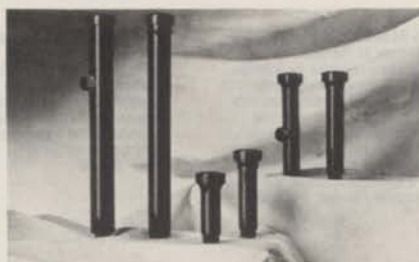
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PRODUCTS from page 72

risers for after-installation arc adjustment. The line also has 45 pressure compensating nozzles for design flexibility and over 90 interchangeable plastic and brass nozzles.

In the six- and 12-inch models, pressure compensating nozzles are color coded and inlets are available on the bottom and side.

Shrub adapters, extenders, micro spray adapters and check valve units are available.



Circle No. 199 on Reader Inquiry Card

New chipper/shredder a more powerful line

A new 8 hp chipper and shredder from Tornado Products, Inc. boasts of greater shredding and grinding power than other models in its size.

The 8 hp Baker model features 12 patented free-swinging triangular hammer units to grab trimmings. The



company says the arrangement allows for more cutting space.

Other patented features include an idler clutch and bearing guard which prevent wear and tear on the V-belt and bearings.

Direct bagging from a side discharge system is standard.

Circle No. 200 on Reader Inquiry Card

Backpack blowers now equipped with autostart

Two backpack blowers from Red-Max feature autostart and recoil

system.

The blowers, which deliver airflows of 600 cubic feet per minute,



start with a push button which activates a self-charging, battery-type autostarter.

Other features on the RedMax line include a ventilated backpad, rubber mounts and a low-noise muffler.

Circle No. 201 on Reader Inquiry Card

Color added to field conditioner

Terra-Green now sells its field conditioner Terra-Green in a green color for use in sports turf repairs.

Terra-Green is also a drying agent and top-dressing which improves aeration and drainage and gives the turf a nutrient reservoir and moisture.

The company says Terra-Green



works well on football and soccer fields, giving a green color to torn areas.

Terra-Green is available nationally from Partac Peat Corp.

Circle No. 202 on Reader Inquiry Card

Brush chipper struts are strong, useful features

Equipped with a 3/4-inch flywheel and two full-length knives, Promark Products' 100 Series brush chipper will handle material up to three inches.

The chipper also features a folding feed apron and materials may be discharged into a pickup truck, trash can

or the ground.

The towable unit can be equipped with eight or 12 hp engines. The company says it is ideal for rental, homeowners, landscapers and nurseries.

Circle No. 203 on Reader Inquiry Card

New chipper will handle biggest jobs

Bandit Industries' new Model 1400 Tree Bandit Whole Tree Chipper features a

14-inch diameter chipping capacity and is designed for nearly all land-clearing jobs, says the company. The chipper produces usable wood chips.

Optional equipment includes a winch which can skip and forward trees into chipper. A backhoe-style loaded, 200-hp Cummins diesel engine, dual-axle suspension and hydraulic lift are standard.

A conventional knife-clamping system is optional.

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Circle No. 120 on Reader Inquiry Card

SURVIVING from page 62

and operation of their company.

These advisors should possess a business savvy. Combine their expertise with others who are experienced in the green industry. Rather than advice from your attorney or accountant, you need to hear from individuals who are not specifically familiar with your company.

Tracking cash flow

If you have not developed a cash flow budget, have your accountant devise one for you.

Such a plan identifies the amount of working capital your company will need and when it will be required in 1991. This reduces anxiety about cash flow because you will have cash reserves available when monetary pressure is highest. This often coincides with the early spring peaks for leads and service.

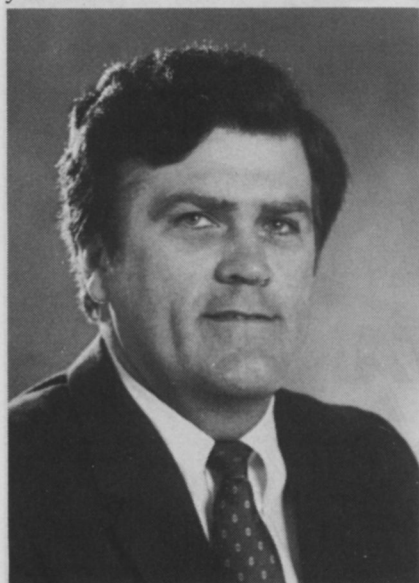
You're not alone

Most green industry companies will feel severe economic pressure in 1991. Developing a plan to operate during tight fiscal times will assist you in achieving your goals.

Make "financial management" your watchwords for 1991.

Know what you must do in anticipation of lower volume; prepare an alternative operating plan that takes into consideration a volume level of five to 10 percent below your anticipated budget plan.

Keep an eye on operations and tight fiscal management. Keeping yourself and your employees focused on the financial impact of everything done in the company will increase the fiscal success of your company both this year and in the future. **LM**



Ed Wandtke is a senior consultant with All-Green Management Associates in Columbus, Ohio.

RESEARCH UPDATE

Iron fertilizers have mixing, pH guidelines

by Kurt Winkler, RGB Laboratories Inc.

TANK MIX pH in pH 9.75 WATER

Rate in 3 Gal. Water	Agri - Plex®	Ferrous Sulfate	Liquid urea/ Ferrous Sulfate
1 oz.	6.86	5.10	3.44
3 oz.	6.40	3.50	2.86
5 oz.	6.20	3.33	2.66
8 oz.	6.10	3.22	2.52

Iron fertilizer applications are gaining attention as a way to provide green color to turfgrass without causing excessive leaf tissue growth.

Iron fertilization is a common practice on golf courses; now, lawn care companies are considering iron applications combined with lower rates of soluble nitrogen or in combination with more slow-release nitrogen products. This is especially important during spring and summer on cool-season grasses, since we do not want to stimulate leaf growth at the expense of root growth. Also, as the environmentally sound concept of "grasscycling" (returning clippings to the soil) gains favor, the controlled growth is even more important since we do not want to "make hay" on a home lawn or commercial property.

While the green industry accepts iron as a valuable nutrient, certain rules should be followed to get the most out of your iron application.

Tank mix guidelines

When iron is tank mixed with fertilizers, especially fertilizers containing phosphorous, the resulting tank mix should be clean and clear, without settling or clouding. When a white, cloudy appearance is observed, the iron is precipitating, or tying up with phosphorus, and this iron-phosphate precipitate is unavailable for plant uptake. Dry soluble N-P-K fertilizers usually contain a blue or green dye which masks this reaction, so this tank mix must be carefully observed.

Iron products mixed with controlled release nitrogen should again be clean and without sediment. If there is a purple sedimentation, then iron availability is reduced due to precipitation.

Amine herbicide and iron tank mixes should also be carefully observed: the mix should be a clear, slightly brown color. Iron that is not compatible with amine herbicides will have a murky brown color with slight settling. This is an interesting reaction because very lit-

tle available iron is lost, but broadleaf weed control may be reduced, particularly on deep-rooted perennial weeds. A compatibility check is advised, especially when using low-volume spray applications of 2 gal./1000 sq. ft. or less.

Rapid pH changes

While it's commonly known that most iron products acidify the tank mix, it is surprising how quickly and dramatically the pH can change, as shown in the chart above:

Liquid iron products containing nitrogen may have slight pH differences, but they are usually formulated at pH 2.0 to 3.0. Furthermore, it's important to remember that, practically speaking, water does not have the ability to resist change in pH. So regardless of your water source and its pH, the ending values are still about the same as shown on the chart.

As a general rule, universities and manufacturers suggest a tank mix pH of 6.0 to 7.0 when spraying fungicides or insecticides. Obviously, not all pesticides are affected by pH, but since it's difficult to keep track of all products that are affected, this is still a good rule.

Since iron is readily absorbed by grass leaf tissue, sprayers should be adjusted to achieve maximum leaf coverage. Low-volume applications will work with a fine spray droplet, but a large droplet should be avoided in this situation.

Chelates protect solubility

Any plant nutrient must be relatively soluble for plant uptake. But since iron is inherently insoluble, manufacturers combine iron with organic molecules called chelates. Chelates protect the iron solubility over a wide range of conditions. Chelation is a complex subject, but for practical purposes, fully chelated iron will avoid the tank mixing concerns mentioned previously. Non-chelated or partially chelated iron should be checked for compatibility. **LM**

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Fighting black spot

Problem: We are finding small (pinhead size), raised spots on wooden decks and house sidings. There are large trees which hang over decks or roofs in some instances, but no evidence of any insects present. What do you think is the possible cause and remedy? (Minnesota)

Solution: The black spots on house structures are often mis-identified as scale insects or insect excrement.

Recently, Dr. Rayanne Lehman from the Pennsylvania Department of Agriculture reported that the black spots are the spores of the fungus *Sphaerobolus stellatus*. I think the problem you are dealing with is related to this fungus. It is a relative of bird's nest fungus, and is commonly called artillery fungus.

Black spot problem caused by *Sphaerobolus stellatus* has been reported in many parts of the U.S. It grows on substrate such as dung or rotted wood chips as foundation mulches. Reportedly, it prefers open areas with little shade and good moisture. It can even produce spores on mulch used on indoor plant pots and shooting spores on walls, draperies, etc. With sufficient light, the spores can be produced at 10-20°C, indicating the problem is primarily during spring and fall.

These black spots are one to two millimeters in diameter and slightly raised to globular. When scraped open, the center is found to be whitish in color. The fungus produces spores (glebal mass or peridole) inside the fruiting bodies. At maturity, the fruiting body wall splits apically and discharges the glebal mass and can throw it up to six meters.

The sticky coating adheres the mass to any substrate. The fruiting bodies are attracted to light (photrophic) and therefore, the glebal mass is shot toward the source of light.

Because of increasing reports of black spotting due to this fungus, composting industries and researchers are now interested in trying to find solutions to deal with the problem. At this time, no fungicidal treatment is recommended. Consider using an alternate form of mulch around foundation plantings. Experts feel that a yearly addition of fresh, treated tanbark or wood chips may lessen the problem if the old mulch is completely covered.

Simply scraping the glebal mass may not work well because the spores have been reported to be viable for up to 11 years. Therefore, practice good sanitation. Hot soapy water may help remove the spots without affecting the paint.

Frequent spraying harmful

Problem: Can you damage tree foliage by applying spray applications too close together? (Canada)

Solution: There would be a potential for damage from applying spray treatments too close together. It depends on several factors:

- sensitivity of the plant material to certain treatments;
- moisture conditions near the rootzone;
- temperature during and around treatment period;
- interval period between treatment;

- application method and/or the pressure used during treatment; and

- circulation of mix in the hose prior to treatment.

Normally, when we follow label specifications concerning treatment rate and intervals, there should not be any adverse effect on target plant species. However, if the growing conditions and/or environmental (climate) situations are not favorable for the treatments, then there would be a potential for damage from spray applications on foliage. The best advice is to read and follow label specifications.

Because of environmental and regulatory concerns, the treatment intervals should be done "as needed" rather than on a calendar date basis. Frequent supplemental treatment should be based on the label or extension and research data.

Managing pine needle scale

Problem: We had a severe problem with pine needle scale last year. How can we manage this problem, and when is the best time? (New York)

Solution: Pine needle scale on pines, particularly mugo pine, can be severe in some years. Severe infestation can be unsightly and can stress and weaken the plant. These plants may recover very slowly and poorly and may require prompt removal.

Dr. Douglas Caldwell, Davey Tree Co. staff entomologist, recommends using 2 percent horticultural oil. He prefers to provide the treatments coinciding with certain plant blooming. This is called phenology. With this approach for crawler (young scale insect) management, he recommends that the first application of horticultural oil be made when Mugo pines are producing pollen. This would be around April 21 to May 19.

The second treatment of oil should be made when the trumpet creeper (bright orange) is in flower (June 25 to August 15).

To catch the majority of the settled crawlers, applications made around the last target dates (May 19 for first application; August 15 for second) are preferred.

A third application may be needed to clean up the escaped crawlers from oil treatments. If needed, consider providing this around September or October before the female matures.

Horticultural oil treatments alone should manage the pine needle scale problem. However, if the problem is severe, an application of insecticidal soap plus either Sevin or Dursban can be used between the oil treatment "windows" as needed.

Read and follow label specifications for best results.

LM



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

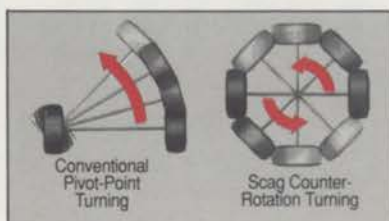
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