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COVER

If you don't mind getting your feet wet, you can make money in aquatic weed control. (Cover photo by Barney Taxel)

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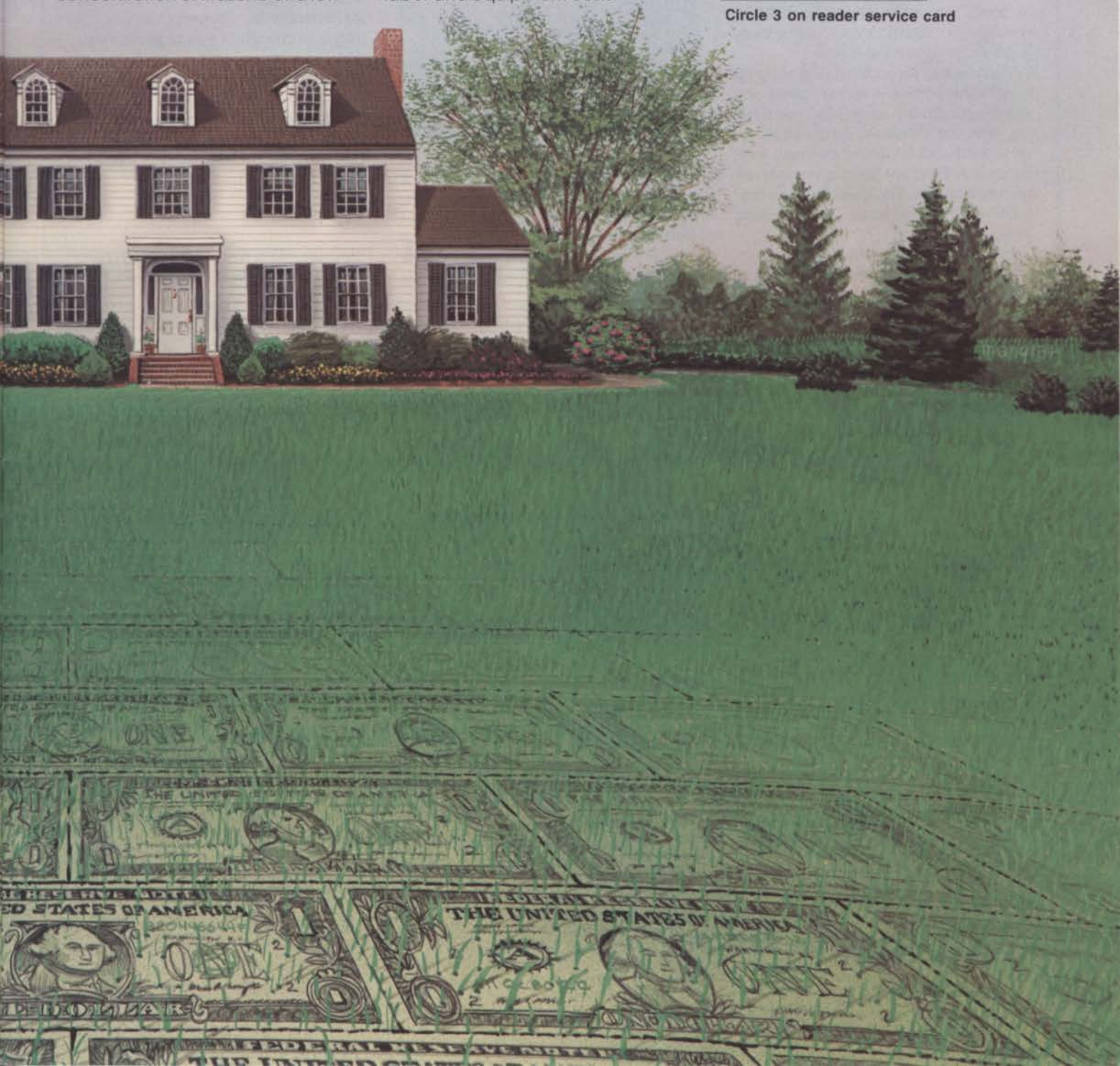
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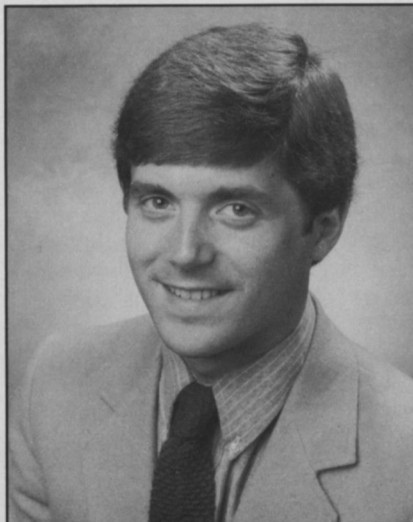


INSIDE STORY

Although we have chosen it as our cover story, aquatic weed control is probably not a service that lawn care professionals have considered as an auxiliary service. Most of those who have investigated aquatic work, or even attempted it, have found it hostile territory. For one thing, insurance companies that are already nervous about the idea of applying pesticides to lawns become absolutely livid when presented with the prospect of applying pesticides to ponds and lakes. Obtaining liability coverage for aquatic weed control work is difficult, to say the least.

There is also the problem of gearing up to offer this service — hiring trained personnel, purchasing equipment, and dealing with the extensive certification requirements. But for the professionals willing to clear these hurdles, the rewards can be considerable. The sheer lack of competition in most states could insure success.

Unfortunately, the article "Regulatory Review" has become an almost annual in-



stallment. However, there is a new wrinkle in the old lawn pesticide regulation issue. This year the emphasis has shifted from ordinances enacted at the local level to laws being drafted by state legislatures. Many lawn care businessmen

are finally beginning to realize that they have to take a "proactive" role by writing their legislators and speaking on behalf of the industry at public hearings.

"Commercial Mower Safety" concerns the set of safety standards that is in place for commercial mowing equipment. Assistant Editor Vivian F. Rose found that the group of manufacturer's representatives who help decide the standards are beginning to change their minds about what constitutes built-in safety features for commercial operators. It may no longer be enough to assume the commercial operator needs fewer safety accommodations.

And of course, we have an educational selection of technical articles. This time on spreader maintenance and Southwestern grub control basics. Enjoy!

Jim Weidner

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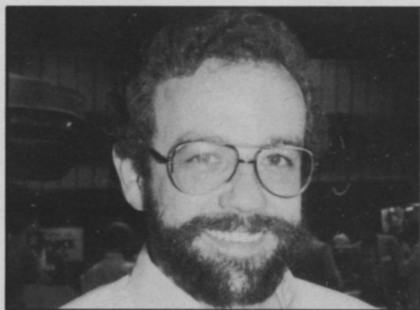
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VIEWS ACROSS THE TURF INDUSTRY

HAVE YOU CONSIDERED AN AQUATIC WEED CONTROL SERVICE?



“We offered aquatic weed control at one time, but the liability risk far outweighed any potential profits. It was some time ago, probably back in 1976, and we were actively engaged in it for a couple of years but we didn’t feel the market was big enough in this state to offset the liability, and since we were engaged in the lawn care end of it, we backed away from it. Aside from that, it was relatively simple. It involved purchasing a boat, custom-rigging it, and putting spray equipment into the boat. It wasn’t very difficult at all, and it was very much in keeping with any applicator training.” — *Ron Collins, R. W. Collins, Satellite Beach, Florida*



“No, to be perfectly honest I haven’t given it any thought because it never occurred to me as being a market. We’re in an area with a lot of lakes, and a lot of farm ponds, and a lot of ponds in front of commercial buildings, but we haven’t gotten any customer requests at all. So in other words, I’m not getting any calls and I don’t have any real motivation to go out and try to sell something that no one’s trying to buy from me anyway. I bet that it’s regional and that there’s a much bigger market in the South and Southeast than we have up here in the Midwest.” — *Jay McNallis, Turftreet/Country Gas Co., Crystal Lake, Illinois*



“Yes I have. In fact, I went to aquatic weed control certification class last December and added it to my certification. It’s a separate certification in Louisiana. But I have not really pushed it all that much. I haven’t run any ads promoting it; not many of my customers have ponds or anything like that. I think I’ve had one call, since I’ve been in business, from a guy who was going to start a catfish farm. I think it’s the industrial customers and municipalities who’d be more likely to use it than the homeowners.” — *J.L. Miller, Green Grass Chemical Lawn Care, Lacombe, Louisiana*

CALENDAR

July 27-29

OPEI Expo '87, Kentucky Fair and Exposition Center, Louisville, Kentucky. Contact: Outdoor Power Equipment Institute, 1901 L Street, NW, Suite 700, Washington, D.C. 20036; 202/296-3484.

July 29-31

American Sod Producers Association Summer Convention and Field Days, Westin Hotel, Seattle, Washington. Contact: Doug Fender, Executive Director, ASPA, 1855-A Hicks Road, Rolling Meadows, Illinois 60008; 312/705-9898.

Aug. 11

Rutgers Turfgrass Research Field Day, Rutgers Soils and Crops Research Center, Halls Mills Road, Adelphia, New Jersey. Contact: Dr. Henry W. Indyk, Soils and Crops Department, Cook College, New Brunswick, New Jersey 08903; 201/932-9453.

Aug. 27-30

ALCA Exterior Landscape Contracting Division Conference, Red Lion Inn, Portland, Oregon. Contact: Rebecca Crocker, Associated Landscape Contractors Association, 405 North Washington

Street, Falls Church, Virginia 22046; 703/241-4004.

Aug. 28-30

Farwest Trade Show sponsored by the Oregon Association of Nurserymen, Portland Colosseum, Portland, Oregon. Contact: Rebecca Crocker, Associated Landscape Contractors Association, 405 North Washington Street, Falls Church, Virginia 22046; 703/241-4004.

Sept. 10

Ohio Turfgrass Research Field Day, Ohio State University, Columbus, Ohio. Contact: Dr. John Street, Ohio State University, 234 Kottman Hall, 2021 Coffey Road, Columbus, Ohio 43210; 614/292-2601.

Sept. 22-23

Virginia Tech Turfgrass Research Field Days, Virginia Tech, Blacksburg, Virginia. Contact: J.R. Hall, III, Virginia Polytechnic Institute, Virginia Cooperative Extension Service, Blacksburg, Virginia 24061; 703/961-5797

Oct. 6

Ohio Turfgrass Foundation Golf Tournament,

Columbus Country Club, Columbus, Ohio. Contact: Dr. John Street, Ohio State University, 234 Kottman Hall, 2021 Coffey Road, Columbus, Ohio 43210; 614/292-2601.

Oct. 24-29

ALCA Interior Plantscape Division Conference, Hyatt Regency Crystal City Hotel, Arlington, Virginia. Contact: Rebecca Crocker, Associated Landscape Contractors Association, 405 North Washington Street, Falls Church, Virginia 22046; 703/241-4004.

Oct. 25-28

1987 International Irrigation Exposition and Technical Conference, Orlando, Florida. Contact: Irrigation Association, 1911 North Fort Myer Drive, Suite 1009, Arlington, Virginia 22209; 703/524-1200.

Nov. 7-11

ALCA Landscape Management Division Conference, Hyatt Regency Crystal City Hotel, Arlington, Virginia. Contact: Rebecca Crocker, Associated Landscape Contractors Association, 405 North Washington Street, Falls Church, Virginia 22046; 703/241-4004. ■



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NEWS IN BRIEF

ROLLINS ACQUIRES NEW ENGLAND GREEN

If you haven't already noticed, big business has gotten into the business of buying-out lawn care companies. On March 20, Ecolab, Inc. began the process which resulted in the successful takeover of ChemLawn. On May 1, New England Green, Inc. was acquired by Rollins, Inc., the structural pest control/security systems giant of Atlanta, Georgia. With the New England Green buy-out, the Orkin Lawn Care Division of the Rollins family has repositioned itself as one of the top five largest lawn care operations in the country.

"This acquisition is an important step forward in our strategy to expand Orkin's lawn fertilization, insect, and weed control service business," says Gary W. Rollins, President and Chief Executive Officer. "Our future plans call for continued growth by internal expansion and by acquisitions."

Rollins' interest in the lawn care industry has not developed overnight. Steve Derrick, Orkin Lawn Care's Technical Director/National Sales Director, says Orkin has always intended to make lawn care an important part of the business. "Gary Rollins has made those statements to investors on Wall Street over the last couple years," says Derrick. "We are just now seeing the fruits of those efforts."

Rollins actually bought Amcare, Inc., which is the holding company that owned Turf Pro Industries, Inc. of Plymouth, Michigan and New England Green, Inc. of Springfield, Massachusetts. Turf Pro and New England Green had merged earlier this year under the name New England Green, Inc. Rollins issued \$6-1/2 million in stock to purchase the combined companies. New England Green's 1986 revenues were approximately \$13 million, according to Jim Hicks, Secretary/Treasurer of Rollins.

Hicks says Orkin's lawn care operation and New England Green's operation are very much alike in that they represent "the upper end" of the lawn care industry. Both companies also utilize the same type of equipment and marketing program. "We were on a friendly basis with the key people at New England Green for some time and had shared a lot of operating ideas together," says Hicks. He says the acquisition has expanded Orkin's lawn care business to 24 markets



Gary W. Rollins

and doubled the lawn care division's size.

Orkin Lawn Care was operating 19 offices in the Southeast before the New England Green acquisition, according to John Raymond, Orkin Director of Acquisitions. He says the division's 1986 revenues were about \$6 million. But this buy-out bumped Orkin into the big league. "We think we are the third or fourth largest lawn care company in the country right now," states Raymond.

New England Green has approximately 80,000 customers in seven Midwest

states, serviced from 24 branches. "The company we bought was doing very fine and the present managers are going to stay with it," asserts Raymond. He says Mike McKee and Dan Chopp, former Chairman of the Board and President, respectively, will continue to operate the company. They will report to Orkin management as regional vice presidents.

McKee is pleased with the arrangement. "New England Green has done a nice job of positioning itself in the industry and now that it is affiliated with the Rollins organization, we expect to be a major player," says McKee. "We are excited about our future." He reports that the company will continue to service its customers under the New England Green name for "an unknown period of time," but will eventually do business under the Orkin banner.

CLCA LANDSCAPE SHOW IS "ANOTHER SMASHING SUCCESS"

"Another smashing success" were the words CLCA President Nelson Colvin used to describe the April, 1987 Landscape Industry Show in Long Beach, California. Approximately 5,000 buyers streamed through the doors of the Long Beach Convention Center during the three days



On hand to cut the show's ribbon, were (from left to right): Alex Rosa, show committeeman; Yvonne Fenner, show coordinator; Nelson Colvin, CLCA President; Don Pagano, show committeeman; Richard Angelo, show committeeman; Walt Young, show committeeman; and Greg Meyer, show chairman.

that the show was open to green industry professionals. They were treated to a capacity slate of 312 exhibition booths.

Each year the exhibits are judged and awards are given for creativity and design. In the open space competition, this year's winner was Valley Crest Tree Company of Sylmar. The winner in the 20-foot by 20-foot size category was The Rock Yard of Visalia. Winning in the 10 by 20 category was Olsen Irrigation of Santee. The 10 by 10 award was presented to Foster Farms/Organic Farms of Delhi. The judges were Richard Cohen and Tony Amato.

The 1988 Landscape Show will return to the Long Beach Convention Center on April 20 to 22. The association already has sold all available booth space, although it maintains a waiting list should vacancies develop. For more information, call 916/448-CLCA.

LAWNMARK PURCHASES SPRAY-A-LAWN

Lawnmark, Inc. of Peninsula, Ohio, a wholly-owned subsidiary of Erbaugh Corporation, recently purchased Spray-



J. Martin Erbaugh

A-Lawn of Orrville, Ohio. Both firms specialize in program lawn care applications and service to residential and commercial customers.

"This decision will benefit our customers and employees," said Jerry Amstutz, President of Spray-A-Lawn. "Lawnmark has the resources to keep Spray-A-Lawn growing. It's a good fit for

all concerned." Amstutz will remain in a consulting capacity with Spray-A-Lawn and provide office and warehouse facilities in Orrville.

"Lawnmark will operate Spray-A-Lawn independently, retaining the Spray-A-Lawn name and identity," according to J. Martin Erbaugh, President of Erbaugh Corporation. "Spray-A-Lawn has a solid base, particularly in Wayne and Holmes counties. This acquisition enhances our market share in Northeast Ohio substantially."

Erbaugh Corporation provides service for over 40,000 customers through branch offices in 11 cities in Ohio, New York, Pennsylvania, and Virginia. This year's annual sales are expected to exceed \$7 million.

MAC DAVIS SLATED AT PRO SHOW '87

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(continued on page 16)

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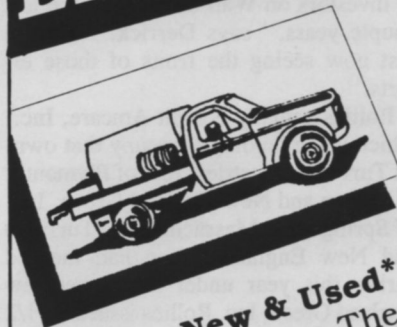
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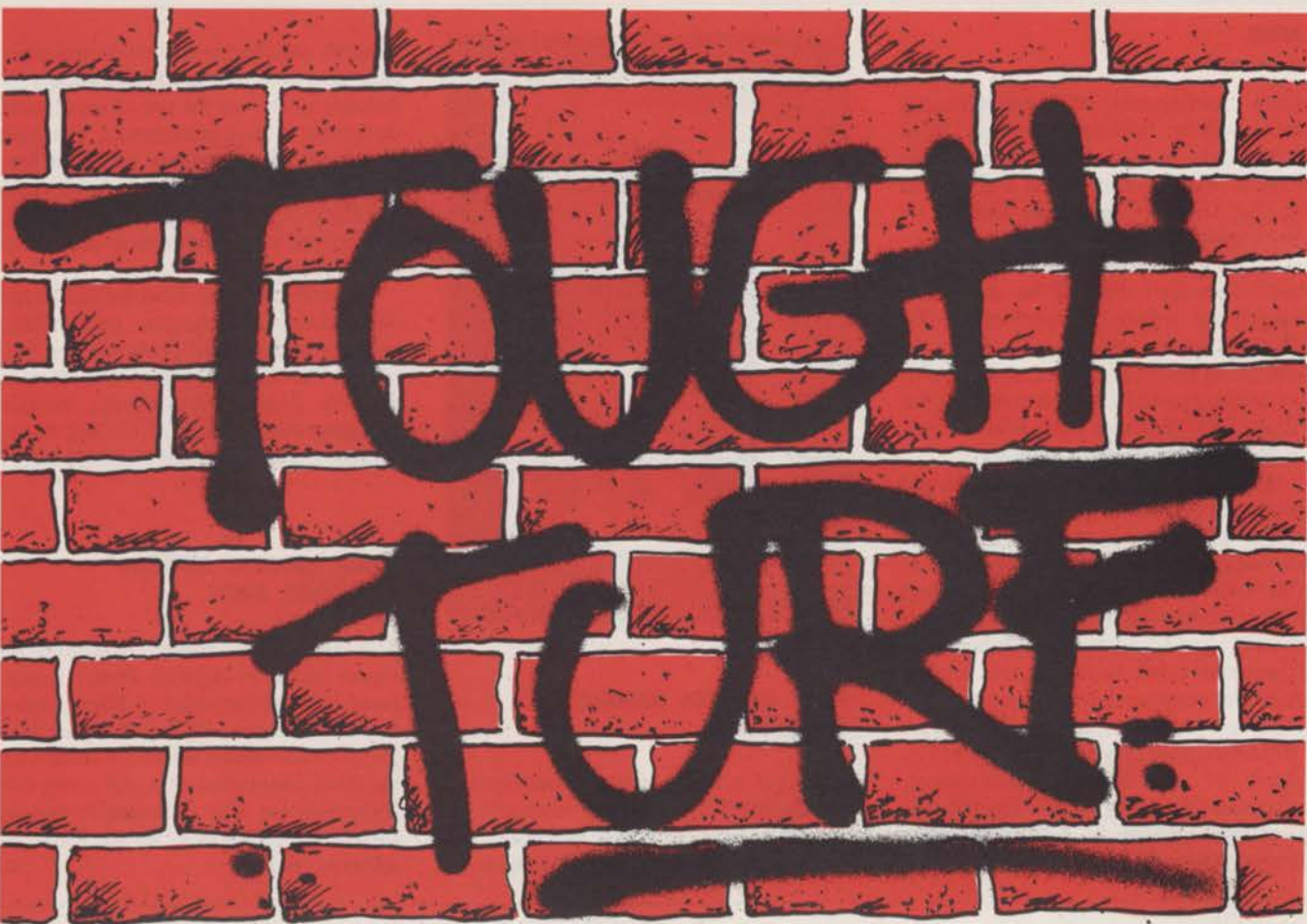
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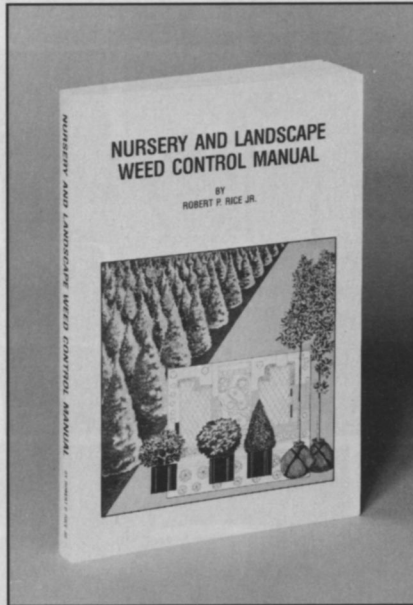
(continued from page 14)

Show participants, the entertainment event will be held on November 19 at 8:00 p.m. at the Dallas Convention Center. The Pro Show itself will be held at the Dallas Convention Center on November 18 to 20.

An all-around entertainer, Mac Davis has established himself as an actor, songwriter, singer, and performer. His uniquely warm and engaging talent has resulted in his being honored as the Country Music Academy's "Entertainer of the Year" and "Favorite Male Entertainer" at the *People's Choice Awards*.

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For information on attending Pro Show '87 and the Mac Davis show, write to Pro Show '87, 101 North Seventh Street, Louisville, Kentucky 40202. The toll-free telephone number is 1/800/654-0349. Within Kentucky, call 502/582-1672.



WEED CONTROL MANUAL IS AVAILABLE

The 1987 edition of the "Nursery and Landscape Weed Control Manual" by Robert P. Rice, Jr. is now available. The text explains the theories behind physical,

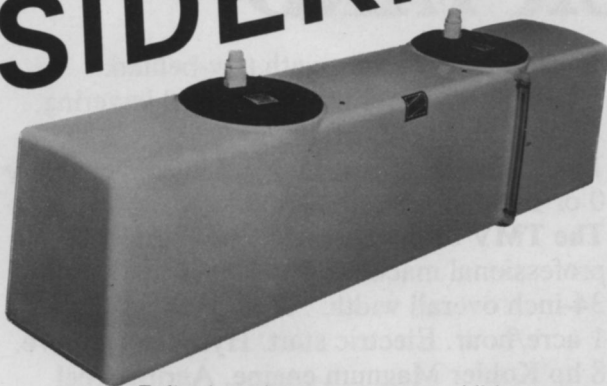
cultural, and chemical weed control practices used in the nursery and landscape industries as well as the use of small scale equipment used in ornamentals. The book also includes a complete listing of herbicides registered for ornamentals, plus the mode of action, registered ornamental species, weeds controlled, and directions for use.

The manual is excellent for landscape contractors, nurserymen, universities, grounds maintenance professionals, and others. The manual sells for \$19.95 plus tax. For ordering information, contact Thomson Publications, P.O. Box 9335, Fresno, California 93791; 209/435-2163.

CHASE REPORTS GROWTH IN MOWER SALES

The short-term Chase Econometrics report issued to Outdoor Power Equipment Institute members in March stated that push mower unit shipments are projected to still remain above 5.4 million for the third consecutive year. All riding unit shipments are also projected to remain above one million units for the fifth consecutive year. ■

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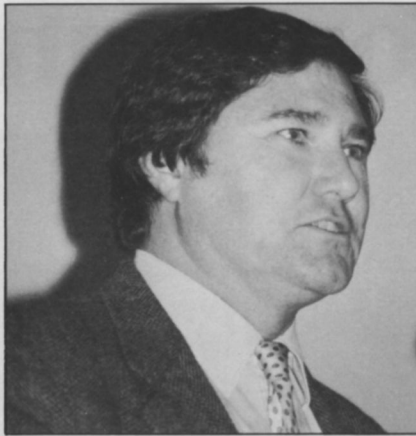
PLCAA UPDATE

The new Defense fund has allowed the Professional Lawn Care Association of America (PLCAA) to develop two significant projects in its ongoing effort to tackle biased media coverage.

PLCAA media consultant, Ford Rowan, has been scheduled to conduct training sessions for PLCAA officers and key members of local affiliate associations. The intensive half-day workshops are designed to prepare spokesmen for media inquiries, enabling them to respond in a positive, self-assured, factual manner.

Rowan conducted two such seminars in 1986. He also spoke at the 1986 PLCAA Convention, and has just completed a Management Monograph for PLCAA titled "A Lawn Care Operator's Guide to Understanding the Media."

Additionally, PLCAA's informative color brochure summarizing the past season's news coverage of the green industry, "The News Media's Lawn Care Scare," is still available. An excerpt



Ford Rowan

reads:

- *Fact or Fiction?* If there are any health risks at all from professionally applied lawn chemicals, a green lawn isn't worth the risk.
- *Fiction.* News media misled people with (several) errors.

The cost of the booklet is 10¢ per copy in multiples of 100, plus shipping and handling. The Defense Fund is supported by PLCAA members and associate members representing research and industry. For more information, contact Doug Moody, 404/977-5222, or write PLCAA, 1225 Johnson Ferry Road, Suite B-220, Marietta, Georgia 30068.

In other news, Roger Staubach, the winningest quarterback in the National Football League, has been chosen as the keynote speaker for the 8th Annual PLCAA Conference and Show, November 12-15.

After 11 seasons in the NFL, including eight and one-half as the Dallas Cowboys starting quarterback, Staubach has established himself as one of the most talented quarterbacks in NFL history. He quarterbacked the Cowboys to two World Championship victories in Super Bowls VI and XII during the 1971 and 1977 seasons. In 20 playoff game starts since 1970, he led the Cowboys to 14 wins. ■

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PEOPLE



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PEOPLE

Mary Jane Goldthwaite has been promoted to chief administrative officer of ChemLawn Corporation and its operating subsidiary, ChemLawn Services Corporation. She will also continue to serve as vice president — general counsel and corporate secretary for ChemLawn.

As chief administrative officer, Goldthwaite is responsible for ChemLawn's legal, risk management, and human resources departments. In addition, she will oversee the public and environmental affairs group, which is composed of the corporate communications, health and safety, legislative/public affairs, and regulatory affairs departments.

A resident of Columbus, Goldthwaite has been with ChemLawn since 1980. She is a graduate of Smith College and received her juris doctor degree from the Ohio State University College of Law in 1973, where she was awarded Order of the Coif, a legal honorary. Goldthwaite has been a partner in a major law firm, and is cur-



Howard Peters

rently a board member of the Pesticide Public Policy Foundation.

Clifford Helwig has been named national manager of the professional products division at Agro Chem, Inc. Helwig has been involved for two years in technical sales at Agro-Chem. His background in the turf fertilizer industry

also includes 15 years with Swift and Company's Par-Ex Professional division, where he held key positions relating to the introduction of new products.

Howard Peters has accepted the position of Plant Manager for the Fermenta Plant Protection Manufacturing and Formulating Facility in Greens Bayou, Texas.

In his new position, Peters will have responsibility for overall management of the company's Greens Bayou Plant. At present, Fermenta Plant Protection manufactures and packages both liquid and dry product formulations for distribution and sales in the world business areas, including chlorothalonil, the active ingredient of Daconil 2787® and Bravo® fungicides.

During his 19 years of service with the company, Peters worked in a number of key areas within the Greens Bayou Plant Production Area. A resident of Kingwood, Texas, he received his Bachelor of Science degree in chemistry from Texas Southern University. ■

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REGULATORY REVIEW

One by one, states all over the country have begun to enact laws that regulate the use of lawn pesticides.

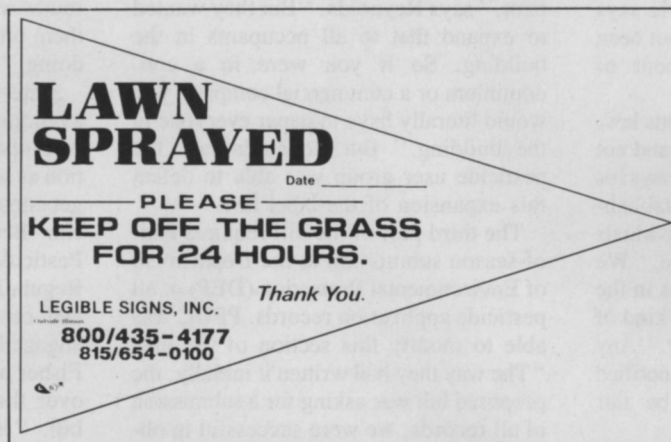
Last year at this time, relatively small groups of lawn care operators were busy combating local ordinances that restricted their business practices in certain cities and towns. This year the regulatory activity has escalated from the local to the state level with several state legislatures enacting or at least considering state-wide regulatory laws. Some states already have laws in place. One such state is Massachusetts.

The Massachusetts law took effect on April 1, according to Bill Sherman, Operations Manager for New England Green of Springfield, Massachusetts. The law requires that the applicator provide the homeowner with a written pesticide safety and environmental statement, homeowners must only be given the opportunity to request prior notification, and applicators must post a sign on the lawn which will remain in place for 24 hours. Happily, Sherman can report that the new law has had little effect upon his business thus far.

"For the most part, it really hasn't affected the way we go about doing business," says Sherman. "I prefer the posting over the prenotification. In showing good faith and going out and posting, it leaves the regulators to believe that there really is no reason for prenotification."

Because some people are now aware of the stipulation in the law which spells out their right to request prenotification, Sherman says he has received 10 to 15 prenotification requests at their Springfield branch. "But when you blend that into 4,000 to 5,000 customers, it really isn't a big percentage and it really hasn't hurt our business at all," claims Sherman.

Lawn care operators in Minnesota didn't get off quite so easily as their peers in Massachusetts. The Minnesota law went into effect on July 1, according to Terry Ambroz, State Coordinator of Min-



A whole new industry has sprung up in response to the need for posting signs, like this one from Legible Signs, Inc.

nesota Pesticide Information and Education (P.I.E.), Prior Lake, Minnesota. Licensing is one of the changes that will affect lawn care operators. Minnesota law used to dictate that only one licensed applicator per firm was necessary. Now, Ambroz says the law requires that all of the applicators in a firm must be licensed individually. "They will have to take the test, get certified, and attend continuing education classes to keep that certification up," says Ambroz.

One positive development is a stipulation in the law that says any city with a population over 10,000 has the option to pass an ordinance under new guidelines proscribed by the law. "They can require a business license of the commercial lawn care firms operating in their city, they can require posting, but the posting must simply state, 'This lawn chemically treated, keep children and pets off for 48 hours.'"

"It was a good compromise," concludes Ambroz. "Lawn care companies can't deal with thousands of different ordinances." She says this part of the law may even encourage firms to post on a voluntary basis just to simplify things. "This law does preempt any local municipality," says Ambroz. She says it also defines the Department of Agriculture as the lead state agency and authority for pesticide use in the state.

"That was language we were really hoping for," says Ambroz. "It has been pretty much a given as far as we were concerned." She says prenotification didn't come up during the hearings, so the legislators didn't make provisions for it in the law.

But just because Minnesota cities must now have homogenous laws doesn't mean that they can't be brutal in their enforcement of the law, just ask Reed Anderson, Vice President/General Manager of Fertilawn, Inc. in St. Paul, Minnesota. The St. Paul city posting ordinance was passed in 1986,

but this year the city declared that it would enforce the ordinance to its fullest.

"We went in there this spring and made 633 applications and out of the 633 applications, we were cited on five lawns because we did not post signs," says Anderson. Because Fertilawn overlooked five lawns, the city council revoked the company's operating license.

"I don't think it has anything to do with making an example out of anyone as much as it is just enforcing the law," reasons Anderson. "I think they were quite harsh in the penalty they instituted on this company." He says the loss of the St. Paul customers constituted 10 percent of Fertilawn's customer base. Fertilawn's management is now looking at all of its options to fight the city's decision, but Anderson doubts that a legal battle would be worth it.

"We might get our license back, but they might revoke it two days down the line for any reason," says Anderson. "We could get our customer's revenue and our good name out of it, but for the price it would cost, it just wouldn't be worth it in the short or long run."

As of April, Maryland also has a posting law. The law states that "a licensee or public agency applying pesticides to lawns or exterior landscape plants shall post at the time of application," according to David Shriver, Chief

of Pesticide Regulation Programs, Maryland Department of Agriculture, Annapolis, Maryland. The sign must remain in the lawn for 48 hours following the pesticide application, after which the customer is responsible for removal of the sign. Shriver says the customer or applicator cannot be held liable if the sign is removed prior to the 48 hour period by outside parties.

"The sign shall be clearly visible either from the principal place of access to the property or clearly visible on the portion of the property where the pesticide has been applied," quotes Shriver. He says the wording for the signs has not yet been decided upon by the Department of Agriculture.

As in the case of the Massachusetts law, prenotification is merely optional and not mandated by the law. But Shriver says his department is considering the establishment of a registry of sensitive individuals that would be managed by the state. "We are meeting with various agencies in the state to try to come up with some kind of program or registry," says Shriver. "Any pesticide that a person wants to be notified of prior to application would be fair game."

Connecticut lawn care operators are off the hook as far as posting and prenotification goes, according to Frank Reynolds, Jr., President of Reynolds Lawn Care, Inc., North Haven, Connecticut. The Connecticut legislative session closed June 3 and lobbying by the Professional Pesticide Users of Connecticut (PPUC) made possible the defeat of both pre- and post-application notification wording in the legislation. But Bill 5521 had three parts, one of which called for an expansion of the label law.

"Right now we are required to give certain portions of the label to the manager of the property and/or the occupant," says Reynolds. "But they wanted to expand that to all occupants in the building. So if you were in a condominium or a commercial complex, you would literally have to paper everyone in the building." But Reynolds says the pesticide user group was able to defeat this expansion of the label law.

The third part of the bill requires end-of-season submission to the Department of Environmental Protection (DEP) of all pesticide application records. PPUC was able to modify this section of the bill. "The way they had written it initially, the proposed bill was asking for a submission of all records, we were successful in obtaining a summary statement of the materials used over the course of the year,

which is not a difficult thing for us to contend with," says Reynolds. But batten down the hatches for the 1988 season, because Reynolds says DEP has already informed them that they had "bigger fish to fry this year," but they will resurrect the posting issue for the 1987-1988 legislative session. "We are trying to get our ducks in line now," says Reynolds. Part of PPUC's strategy includes public relations efforts like extending invitations to members of the Environment Committee to visit PPUC members' facilities and go out on the routes with the applicators "to familiarize them with the industry and what we are doing," according to Reynolds. State-wide lawn care regulations are in a holding pattern in Ohio, but Ohio lawn care operators can expect some legislation as soon as the sponsoring senator can get enough support for his bill. Last fall, Jim Betts, Executive Director, Ohio Pesticide Applicators for Responsible Regulation (OPARR), Cleveland, Ohio, and other members of OPARR, were engaged in negotiations with Senator Fisher and members of the Sierra Club over the wording of Fisher's proposed bill. "He says he plans to introduce it very soon, but he has been saying that for

(continued on page 23)

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REGULATORY REVIEW

(continued from page 22)

several months," says Betts. "I know he wants to deal with it during this session of the Ohio General Assembly, which began January 1 and ends December 31, 1988."

Iowa has followed the example of Minnesota and enacted a law which requires that all applicators in a firm be certified rather than just one key employee. This law took effect on July 1, according to Daryll Johnson, All American Turf Beauty, Van Meter, Iowa. The law also raises the licensing fee and toughens renewal requirements. Before, applicators could take a test, pay \$10 for a 3-year license, and get their license renewed by attending a recertification training course which was conducted at the Iowa turf conference. "Now you take a test either annually if you want a 1-year license, which costs \$25 a year, or you can get a 3-year license for \$75," says Johnson.

House File 631 is also designed to protect the groundwater from urban pesticide applications. The law empowers the Secretary of Agriculture to determine prenotification regulations, set a schedule to determine "the periods of application least harmful to living beings," and adopt rules to implement these provisions. Municipalities in turn are empowered to implement this wording and report infractions to the Department of Agriculture.

This law also establishes civil penalties for violations by commercial applicators, according to Johnson. The Secretary of Agriculture is instructed to designate "pesticide management areas" based upon the incidence of past infractions.

The law also mandates that commercial applicators must have a pesticide dealer's license. "A pesticide dealer shall pay a minimum annual license fee of \$25 or an annual license based on 1/10 of 1 percent of the gross retail sales of all pesticides sold by the pesticide dealer in the previous year," says Johnson. It also requires reporting of annual fertilizer and pesticide use.

Johnson says the bill was prompted by a combination of pesticides found in a groundwater survey, a crusade by the *Des Moines Register*, and a "group of democratic legislators in the House whose mission in life is to eliminate the use of pesticides." He says the original bill drafted by these legislators has been toned down a lot thanks to the united front presented by a coalition of pesticide users including farmers, petroleum interests, nurserymen, golf course superintendents, and lawn care operators.

"We are in the process of establishing what we call Iowans for Food and the Environment, which is patterned after Oregonians for Food and Shelter," says

Johnson. This powerful lobbying force pointed out to the legislators that they didn't have any federal standards and that they didn't have a stringency law so the state could be more strict than the federal government, according to Johnson.

"It still isn't over yet," says Johnson. "We still have to have hearings. We have to be there in force to make sure they don't have prenotification. The rest we can live with."

These state laws which are pending or have already passed are really just a sampling of the state laws nationwide. There are also laws that have passed or are about to be passed in Rhode Island, Missouri, Michigan, and California. The

fact that Ontario has lifted its moratorium on the use of 2,4-D is an encouraging sign that may influence legislators in this country, but not without intensive lobbying by pesticide users.

It is already too late to hope that the big lawn care companies and the chemical manufacturers have enough political clout to influence legislation on a state by state basis. Every pesticide user, including the smallest of lawn care companies, has to get involved and communicate with their state legislators in an effort to make proposed legislation more livable. — *Tim Weidner* ■

The author is Editor of ALA magazine.

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COMMERCIAL MOWER SAFETY

Outdoor power equipment manufacturers are very conscious of safety and continually striving to make today's commercial equipment easier to operate and safer to use.

Almost everyone in this country is familiar with standards of one kind or another. A degree or level of requirement, excellence, or attainment is evidenced in many aspects of daily life. For example, the Food and Drug Administration has certain standards which meats and other foods must meet before being sold commercially. Prior to obtaining a driver's license, we are required to meet certain criteria, such as passing an eye test, a written exam, and an actual driving test. Our personal lives are also influenced by standards — we each have our own individual code of ethics.

So it's not surprising that standards exist for outdoor power equipment. While safety standards are not new to the industry — retail or consumer mower safety standards have been around for 25 years or more — it wasn't until 1980 that the first commercial safety standards were approved by the American National Standards Institute (ANSI). Their approval may have been recent, but their development was initiated by the Outdoor Power Equipment Institute (OPEI) in the mid 1970s. Prior to the introduction of the formal commercial standards written and sponsored by OPEI, outdoor power equipment manufacturers established their own safety requirements or relied on individual state standards, where they existed.

One of the reasons consumer safety standards preceded commercial standards, and by quite some time, was because of the larger quantity of retail mowers versus commercial mowers in the marketplace. "The consumer end is 90 percent of the business and the commercial end is 10 percent," notes Helmut Adam, President of Ransomes, Inc., Johnson Creek, Wisconsin. "So the thrust was really in the consumer area. It was assumed that the commercial user is much more educated and much more aware of



The remote pull-cord positioning is one safety feature incorporated in many commercial mowers.

the use of the machine."

John Liskey, Statistical and Technical Director of OPEI, concurs. "The old school of thought was that when you had a piece of commercial machinery, it was being operated by a 'professional' operator, somebody who was trained and knew what they were doing."

While neither Liskey nor OPEI is asserting that the industry does not have trained or professional operators, the need for commercial safety standards was prompted by an increase in the number of general lawn care services which have started to offer commercial mowing. So in addition to the growth in mowing maintenance companies, the market has attracted many of the other lawn care segments, including chemical applicators and landscapers, over the last decade or more.

"Almost anybody out there is mowing lawns in a commercial fashion," explains Liskey, "so there's need for a more safe machine."

That's not to say that outdoor power equipment manufacturers weren't safety-

conscious prior to the establishment of commercial mower standards. On the contrary. According to Helmut Adam, Ransomes did not have to make any changes on the company's commercial mowing equipment when the first standards were introduced in 1980. The mowers already complied with the ANSI/OPEI requirements.

"All the outdoor power equipment manufacturers try to make sure that they've considered all of the safety aspects of the machine and have addressed them," Adam says. "We all have families, we all have employees, we all have consciences. None of us wants to build a machine that's unsafe."

The proof is that the majority of the industry complies with the commercial mower safety standards, which are voluntary. According to John Liskey of OPEI, all of its members support the Institute's standards and the organization represents 70 percent or more of the outdoor power equipment industry.

For the most part, consumer mower safety standards are also voluntary. However, the federal government has mandated one requirement which applies only to retail mowers at the present time. Because people were getting hurt with walk-behind consumer mowers, Liskey explains, the Consumer Products Safety Commission instituted an operator presence control standard. In essence, he says, all retail mowers must have a control on them that stops the mower blade from running within three seconds after the operator leaves the operator position.

"People were cleaning out the shoot with the mower running and they'd get their hands either cut off or severely hurt. So in 1982, an operator presence control was added to the consumer standards." Most retail units have the control built into the lawn mower's handle, he adds.

The commercial mower safety standards, which were revised in 1984 to in-

clude additional guarding requirements and other general improvements, does not currently include an operator presence control. However, according to Liskey, "We're starting to look at the commercial standards right now and one of the major things under consideration to be changed is putting requirements in the commercial standards for operator presence controls like those in the consumer standards."

"Again, there was never a thought to need these type of things in the commercial standard. You have a 'professional' operator. He knows not to put his hands and feet in the blade," notes Liskey. "But that thought process has changed somewhat. A lot of commercial manufacturers are saying, 'Why should a commercial mower be less safe or less protective of the professional operator than the consumer one?'"

Even without the requirements for an operator presence control in today's standards, some manufacturers have already installed these devices on their commercial walk-behind mowers.

"We went to a zone re-start engine right away, which means that the engine dies when you leave the operator position," explains Helmut Adam of Ransomes, Inc. "It's inconvenient and it's something some customers have come back and complained about, but we do not feel comfortable not doing it because of the legal ramifications. When we go to a jury trial, they're not going to care whether it was a consumer or commercial mower."

Liability is a key concern of outdoor power equipment manufacturers, and another reason why many of them support commercial mower safety standards. "The reason you like to have standards is so you don't have, for example, someone pushing the pedal with this foot to go forward on machine X and then on machine Y that same maneuver makes the unit go backward. You're really trying to offer an engineering standard so that you help with the safety of the machine for the operator as he crosses from manufacturer to manufacturer," Adam explains. "We don't want to end up like automobiles, where the steering wheel is on one side in England and in this country it's on the other side."

Today's commercial mower safety standards include guarding and shielding requirements for either walk-behind or riding mowers. "A guard must be in place so that an operator does not get his hand on the blade or any other rotating part," Liskey explains. "Some of the commercial machines are huge with lots of belts and gears."

In addition, he says, there are requirements and certain tests to insure that objects thrown from the machine are not

going to hit the operator or a bystander.

Commercial mowers must also be labeled properly. "Manufacturers are required to put labels on the mower that say something like, 'Make sure you read the owner's manual before operating,' or 'Keep away from this rotating part.' Also, there are general requirements as to what categories should be covered in the owner's manual, such as operation, servicing, and maintenance of the machine."

Performance standards require manufacturers to adequately test their commercial mowers. "There are tests in the standards for brakes. Commercial

mowers should have certain stopping distances and certain holding abilities for use on a hill, for example," Liskey explains. "There are stability requirements, too, meaning that the machine has to be able to operate on certain slopes without tipping over."

The operator controls must fit into a certain zone so that they can be easily and safely reached by the operator. "While the standard does not specify exact dimensions, it provides a safety range of where controls should be," Liskey explains. "We don't want our standards to be design-restrictive. We want general



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guidelines that address safety but still allow the manufacturer flexibility in meeting the requirements."

To make sure that neither hands nor feet can get into the rotating blade area, manufacturers are required to perform foot and finger probe tests. "The finger probe and foot probe are devices that look like either a finger or foot, which manufacturers use to probe different areas around the mower's moving parts to make sure that a finger or foot cannot get into the particular area." These are only two of almost a hundred different requirements in the commercial mower safety standards.

According to B. Duane Bustle, President of OPEI and Vice President of Manufacturing for Trail Mate, Inc., Sarasota, Florida, the major difference between the commercial and consumer mower safety standards is the operator presence control. While the commercial safety standards are more detailed because of the wide variety of commercial mowing equipment versus consumer machinery, both sets of standards are quite similar. There are basic requirements for control, labeling, thrown objects, finger probe, foot probe, and stability, he says. The commercial machines, however, tend to have more

stringent requirements in these areas because they are used in varied locations and different situations. In addition, commercial machines are used 40 hours a week, unlike consumer mowers which may not see that much usage in an entire year.

That very issue generates concern among outdoor power equipment manufacturers. "After a commercial machine is five or 10 years old, we have to insure that it is still as safe as it was when it came out of the box," notes Helmut Adam. "We have concern when the operator buys parts from somebody else that don't exactly fit and suddenly exposes the blade. That has happened," he adds, "so we try to establish standards that help insure that this product will remain intact for the duration of its life."

The need for a particular safety device is determined by manufacturers themselves. OPEI's Technical Advisory Committee has a subcommittee comprised of engineers representing various outdoor power equipment manufacturers which keeps abreast of the hazards associated with their machinery. Once an idea is suggested, it goes through a long, involved process before becoming a standard.

"There are a lot of meetings, a lot of

fighters, and finally a consensus or agreement," according to John Liskey. "From the beginning to end of the development of a voluntary standard, you can figure on probably three to three and a half years." For example, he says, OPEI's subcommittee on commercial mower safety standards has been working on its latest revision for about a year and the group is on its fifth draft. If an operator presence control standard is approved, it will be another two or three years before it's actually adopted, he says.

Even after the subcommittee agrees on changes in the standards, they must be approved by OPEI's Technical Advisory Committee, then OPEI's Board of Directors, then OPEI's general membership, Liskey explains. And then they still have to go through the American National Standards Institute's approval process, which allows the general public to comment on the standards, he adds.

"It's an ongoing process. And that's a tribute to the manufacturer," Liskey says. "They're willing to work on these standards and constantly improve them. None of our standards are stagnant." — Vivian F. Rose

The author is Assistant Editor of ALA magazine.

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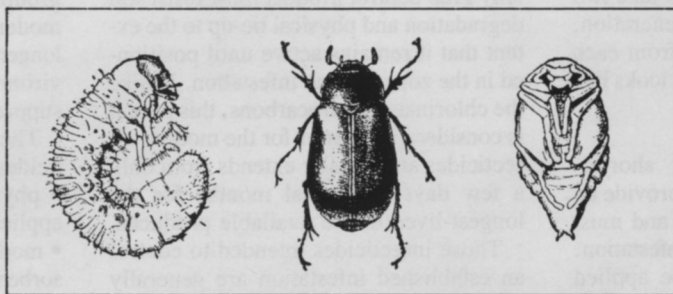
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SOUTHWESTERN GRUB CONTROL BASICS

When you are talking white grub control in the Southwest, you are probably talking June beetles. Control of these lawn pests just requires a little know-how.

Some southwestern lawn care operators have reached a stalemate in their attempts to control the white grub. This pest, which is capable of the complete devastation of a lawn, can produce widespread turf destruction with an intensity that few turf pests can match.

The white grub, which could also be called the "hidden menace" or "sudden death," can produce damage that goes largely unnoticed up to the point from which turf recovery is doubtful. This larval stage of several species of scarab beetles is, surprisingly enough, one of the few major turf pests whose infestations can be reasonably predicted from season to season. While bionomic variations in their lifecycles may occur between geographic regions, the presence of the swarming adults can serve as a reference for implementing an effective control strategy.



BIONOMICS. In practically any area, large swarms of the adult beetle can be observed in nightly flight, attracted to the opposite sex amidst the glow of street lamps, patio lights, or almost any considerable source of illumination.

Within a matter of days, the females have laid eggs in the soil and the beginning of a new generation is signaled with the sometimes massive accumulation of the expired adults on lawns, sidewalks, patios, and in swimming pools. Within a few more days, the first instars of the larval stage of this Scarabaeid beetle, usually

In many western states, problems with June beetle grubs are almost as predictable as clockwork, with at least some form of the same generation residing in a turf soil for no less than 75 percent of the calendar year. Why then, if we know exactly where the grub will be and when it will be there, do applicators have such difficulty

in preventing grub damage?

The answer may lie with the failure of applicators to understand the rudiments of this pest's deceptively simple life cycle and the relationship of the chosen insecticide to environmental conditions.

TIMING. Timing is the key to controlling grubs before damage can be realized. The critical control period extends from usually two weeks after the oviposition of eggs is known to have occurred, and up to a month after the presumed larval emergence. This period may vary between regions and species. It is within this period that it is safe to assume that the bulk of the young larvae are no longer protected by their impervious eggs and before any notable damage to turf has occurred. In addition, the mortality rate of the first larval instar is much higher per unit dose of insecticide than with the medium to fully developed grub.

While in the temperate regions, control is usually possible anytime between mid-June through October, although waiting until after July can give the energy-craving grubs an opportunity to do severe damage, plus require the use of higher insecticide rates for adequate control.

After October, grubs found in temperate areas may be from 75 to 90 percent developed and will migrate deeper into the soil to overwinter and get out of range for economical control. As warm weather arrives the following spring,

The larval stage of several species of scarab beetles is, surprisingly enough, one of the few major turf pests whose infestations can be reasonably predicted from season to season. The presence of swarming adults can serve as a reference for implementing an effective control strategy.

Since white grub life cycles do vary from region to region and from species to species, for the purposes of this discussion, we will concentrate on the *Phyllophaga* complex of "June beetles" of the Southwest. Unlike the annual life cycles of the northern white grubs, the southwestern June beetles develop over a two- or three-year-per-generation life cycle.

Phyllophaga spp. (or others such as *Macrodactylus* spp.) are beginning to feed on the tender roots of turf. These larvae will eventually leave the grass plant devoid of its last remnant of life-giving root surface.

The worst part of all, as with many human disorders, is that a grub infestation is usually not recognized until the *permanent wilting point*, and consequent death of the turf has occurred.

these same individuals begin what is to be their final surge of feeding in order to regain energy lost during winter dormancy and to facilitate pupation which usually lasts from 40 to 60 days.

Control during this period would more or less be futile since the primary damage was incurred the previous summer and because the feeding stage of this pest's development has all but passed. Consistent with the common name of this pest, the adult beetles then emerge from the pupal stage in mid- to late-June to once again initiate the next generation.

The pre- and post-winter feeding activity of the larval stage has led many an applicator to incorrectly assume that a staggered, or two-generation-per-year life cycle exists. Thus, they perceive that any successive control efforts are essentially ineffective. In fact, June beetles take two or three years to complete a generation, but there may be individuals from each "cycle" in a given site so that it looks like there is overlap.

INSECTICIDES. Many of the shorter-residual grub insecticides will provide an acute kill of established grubs and must be applied during an ongoing infestation. Other insecticide types can be applied prior to the larval emergence and, with a higher degree of soil persistence, control the larvae as they emerge. With these

more residual insecticides, a grub infestation must be assumed beforehand and applications must be made soon enough before the larval emergence to assure the timely positioning of the product in soils, but not so early as to allow degradation of the active ingredient to occur.

The frequency of a scarab beetle's reproduction does not favor development of rapid genetic resistance to insecticides, as is possible with the more prolific reproducers. Ineffective grub control is too often explained as grub resistance to a particular product. Instead, the applicator should pay more attention to the fate of the product after it has been applied.

Besides poor application timing, failure of applied insecticides to reach their target constitutes the major grub control pitfall. Any grub control product must resist soil degradation and physical tie-up to the extent that it remains active until positioned in the zone of grub infestation. Unlike the chlorinated hydrocarbons, this period is considerably shorter for the modern insecticides and usually extends from only a few days to several months for the longest-lived of the available products.

Those insecticides intended to control an established infestation are generally more susceptible to rapid degradation than are the more residual preventatives, although they are usually more acutely

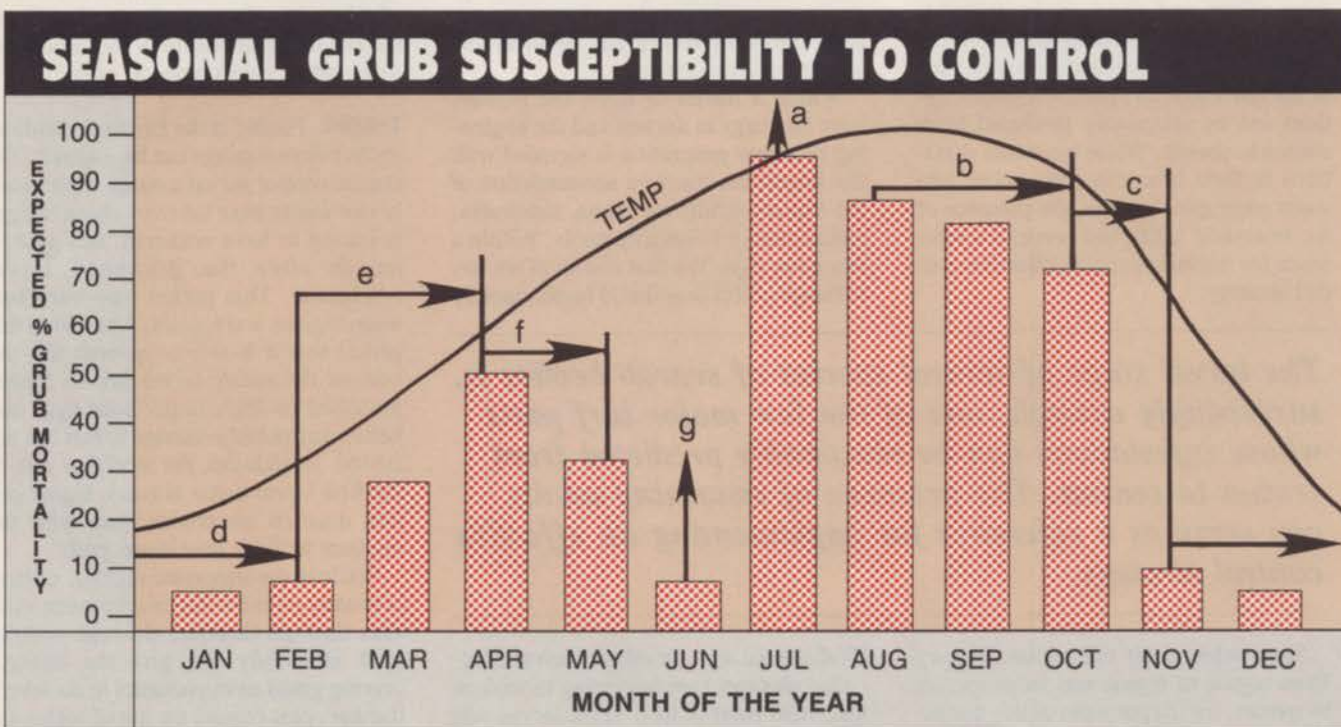
toxic to grubs.

Between the time a grub control product is applied and is assumed to contact the target, environmental factors can greatly alter the ultimate control strength of the insecticide. It is therefore the responsibility of the applicator to recognize and compensate for these environmental antagonists in order to realize a more effective grub control program.

THATCH. Thatch is the first obstacle an applied insecticide must encounter. A heavy thatch build-up is much like a very large, absorbent sponge capable of retaining extremely large volumes of a solution. Besides physically retaining an applied insecticide, decomposing thatch layers are virtual "factories" capable of rapidly decomposing organic matter and altering groups of organic compounds, of which modern insecticides are included. The longer an insecticide is exposed to this environment, the more its efficacy is suppressed.

The effect that thatch has on insecticides can be minimized by:

- physical removal of thatch before an application;
- moderate pre-irrigation to displace absorbent thatch surfaces with water, rather than by the insecticide;
- and by increasing the allowable spray volume to decrease the actual amount of



Typical bionomics of the scarab beetle grub in temperate regions. a) Grubs first emerge. Early instars are most susceptible to treatments. Effectiveness from any residual, pre-hatch insecticide is maximized at this point. b) Mortality may decline somewhat because grubs become larger and more resilient to treatments. Control from pre-hatch insecticides becomes doubtful at this point. c) As temperature drops, control from post-hatch treatments will drastically decrease as grubs migrate deeper into soil to overwinter. d) Grubs at maximum overwintering depth virtually exclude control from any conventional attempt. e) As soil temperature increases, grubs begin to migrate upward where control becomes possible. As feeding resumes, grubs become even larger and better able to tolerate insecticide applications. f) As pupation begins, the number of susceptible larvae drastically decreases as impervious pupal cases are synthesized. g) The majority of grubs will have become pupae or the emerging adult beetle. Mating and oviposition occurs.

active ingredient absorbed in the thatch.

On heavily thatched turf, avoid using the more concentrated insecticide rates that may depend upon independent irrigation for ultimate dilution. Also be aware that some materials (such as Proxol®) move through thatch more readily than others.

SOIL. Ideally, a turf with sandy, low-organic matter soil would exhibit the best conduction of the full-strength soil-applied insecticide. Unfortunately, the tighter soils associated with many turf areas provides a less than perfect medium for solution movement. The tension of many soils can greatly retard the downward movement of insecticides by lateral capillary movement. High organic matter content can both absorb solutions and enhance microbial breakdown of in-

soil chemistry otherwise. Specific recommendations for chemical complements should be supplied by the manufacturer of the product in question.

The extent to which soil will hydrolyze, adsorb, absorb, or affect an insecticide in some way, is related to control effectiveness. It is therefore the ultimate responsibility of the applicator to assure that the proper cause and effect of a soil-related control problem is recognized.

IRRIGATION. The ultimate purpose of grub control applications is to place an insecticide solution of adequate potency, within the zone of grub occupancy. To effect both insecticide strength and positioning, independent irrigation should be considered a primary tool.

Whether a granular or liquid formulation is used, subsequent irrigation will

carrier or post-irrigation volumes accordingly.

Because granules are totally dependent on irrigation for ultimate dilution, the rate at which a particular product is solubilized should additionally be a consideration of post-treatment irrigation volumes. Also, both irrigation frequency and rate of product application should be adjusted in accordance with soil texture and type, but always within the ranges specified by the manufacturer.

OTHER CONSIDERATIONS. Needless to say, grub control applications should be as uniform as possible with respect to coverage and volume. When the shorter-lived insecticides are used, any missed or unaffected grubs can migrate into a previously treated area to further cause considerable turf damage. Likewise, migration of grubs from untreated turf adjacent to the treated area can quickly produce reinfestation unless physical soil barriers are installed.

Applying insecticide to soil that is completely water-saturated should also be avoided. Very little downward movement of solution will occur and hazardous runoff and puddling can create problems.

CONCLUSION. The soil and thatch through which a soil-applied insecticide must travel is by no means inert. Although effective insecticides may be employed, the applicator must additionally perceive and manipulate the environment through which insecticides must pass in order to protect the integrity of the applied product until its purpose can be fulfilled.

The physical, biological, and chemical factors specific to a particular location or region must be examined and the causative pest species, along with its life cycle, has to be determined so that effective and economical grub control can become possible. — *Jim Ware*

The author is a structural pest control and lawn care consultant residing in Hobbs, New Mexico.

As the soil types become more chemically and physically inert, the possibility of over-irrigating increases because of a more unimpeded solution movement. Care should be taken in sandier soil or sandy "hot spots."

secticides. If labeling permits, the use of higher insecticide rates or carrier volumes may be necessary for these soils of higher clay content or organic matter.

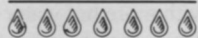
To additionally assist the downward movement of insecticide solutions, a pre-treatment of tight soils with a commercial soil penetrant or an appropriate surfactant may also improve insecticide positioning in the soil.

From a purely chemical point of view, high pH soils such as those of many western states, can adversely interact with the active ingredient of some popular insecticides to reduce their strength or soil longevity. It may be possible to counteract these adverse effects by the addition of an adjunct, such as iron sulfate, which will temporarily lower the pH or improve the

reduce the concentration of active ingredient as it is moved downward. The degree to which irrigation affects the density of insecticide distribution throughout soil is proportional to the initial concentration of product at or near the soil surface and the volume of subsequent irrigation. Besides a proper active ingredient concentration in the grub zone, the chemical-to-grub contact must be maintained for a minimal period of time to realize acceptable mortality rates.

As the soil types become more chemically and physically inert, the possibility of over-irrigating increases because of a more unimpeded solution movement. In sandier soil, or sandy "hot spots," care should be taken to identify grub zone depth and adjust either liquid

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MAINTAINING YOUR SPREADER

The best granular lawn care materials in the world will not perform adequately in a spreader that has not been properly maintained.

As lawn care professionals, you spend a lot of money for fertilizers and pesticides, and invest a lot of time in applying them. You are probably very careful about picking the best products for your customers' needs. Unfortunately, you may be neglecting a critical part of the lawn care system — your spreader. It doesn't make any difference how good the fertilizer and pesticide products may be if your spreader doesn't do a good job of applying the products.

Previous articles in *ALA* magazine have discussed spreader calibration and use (Spreaders: Theory vs. Results, December, 1986; Is Spreader Data Reliable?, January, 1986; Drop Spreader Complications, April, 1986; and Spread it Right, July, 1985). This article will discuss proper maintenance of your spreader for optimum performance and long life.

CLEANING. The most important thing you can do for your spreader is to wash it thoroughly and regularly. Most spreaders should be washed completely *after each day's use*. After washing your spreader, it should be allowed to dry thoroughly before use or storage.

Cleaning your spreader is important for two reasons. First, it will greatly increase the longevity of your spreader. Tests with spreaders with metal hoppers have shown that the useful life can be more than doubled by washing after each use. The increase in life is probably not as great with plastic hoppers, but is still an important consideration.

An even more important reason for cleaning your spreader is to maintain proper performance. A spreader with material built up around the impeller or near the metering ports can deliver an incorrect rate and/or pattern. Even a small amount of buildup on the impeller can change the coefficient of friction of the



Figure 1. Calibration of a professional rotary spreader using a calibrating pin provided by the manufacturer.

granules sliding on the impeller, and thus cause them to fly off the impeller at a different point.

Washing a spreader may be a simple matter of turning a hose on the spreader, or it can be considerably more complicated — depending on the type of products you are applying. Fast-release fertilizers are cold-water soluble and come off easily with a hose. Most granular pesticide materials are also easily removed with cold water. Many of the slow-release fertilizers can be more difficult to remove.

Urea formaldehyde fertilizers are basically a partially-reacted plastic. If fertilizer binds up in some parts of the spreader (like under the agitator) the heat resulting from friction can cause the material to further polymerize and form a hard plastic buildup. Hot water is the best way to remove this buildup.

A hose delivering hot water works

well, but is frequently not available. A good alternative is to shut the spreader ports and pour a bucket of hot water into the spreader. By the time the water leaks out of the spreader, the material is generally softened enough to allow easy removal with a stream of cold water from a hose. If the material is persistent, an additional treatment with more hot water or light scrubbing with a rag may be required.

Some of the encapsulated fertilizers may be even more troublesome. Some sulfur-coated-urea products have a coating of wax or some petroleum sealant. Some (not all) of these materials have been found to rub off on the spreader and cause a buildup that is water-insoluble. If this occurs on your spreader, you will need to remove the material mechanically by scraping, or with a solvent. You should check with your spreader supplier

to see what solvents are safe. With typical polyethylene or glass-filled polyester hoppers, most solvents should be safe. The same is true for epoxy-coated metal hoppers. Be particularly cautious with solvents around styrene or ABS plastic parts.

It is important that you clean the spreader thoroughly. Not only the hopper must be cleaned, but also the impeller, gears, axle and bearing areas, and rate-adjusting linkage. If your spreader has readily removable parts such as gear covers or a replaceable hopper bottom, by all means remove them for cleaning. While washing the spreader, it helps to operate all mechanisms such as the on/off lever to loosen material that might be trapped under parts.

One possible exception to the recommendation for daily washing is the electrically-powered rotary spreader. The motors on these spreaders are generally sealed, but can still be damaged by excessive water. Check your operator's manual for recommendations for protecting the motor during washing, or for alternate cleaning directions.

After the spreader is washed, it must be allowed to dry before storage or reuse. The best way of drying most spreaders, is to let them sit in the sunshine for a few minutes. In most cases, you will have to turn the spreader over once to drain water that stands in the hopper. Drying in a warm, heated area is effective too. Blowing hot air on the spreader can be harmful, whether the spreader is metal or plastic.

LUBRICATION. Lubrication is critical on spreaders. Many spreaders have been ruined because they weren't lubricated. On the other hand, the major cause of gear failure on some models of professional rotary spreader is lubrication of gears that shouldn't be lubricated. The main point, again, is: Follow the instructions in your operator's manual for lubrication.

Axle bearings need lubrication on most spreaders. If the spreader has zerk fittings, use them; if not, you should generally apply oil to the bearing areas (but check your operator's manual to be sure).

On most professional rotary spreaders, the gears should *not* be lubricated. On most common models, the gear cover is designed to keep dirt out, not to be a grease reservoir. In most cases, the gear support should be lubricated with oil or grease, but the lubricant should not be allowed to get on the gears. Oil or grease on the gears allows gritty dirt to build up — even with a dust cover in place. This

grit building up in grease or oil is the main cause of gear failure. The plastics used for most spreader gears are designed to be self-lubricating. Some even contain a molybdenum disulfide lubricant impregnated in the plastic.

Other points on the spreader may also need daily lubrication. On drop-type spreaders with metal hoppers, it is usually desirable to rub a few drops of oil across the ports under the shut-off bar.

The choice of lubricants for a given point on a particular spreader is critical. The problem is that some of the plastics used for spreader components are affected by some of the solvents used in certain lubricants. Since most spreaders use several different plastic resins for different parts, you do have to be careful and not make an overall assumption about your spreader.

Some lubricants act as solvents for certain plastics. Styrene and ABS are damaged by some common aerosol lubricants. A related problem is that certain lubricants may be stress-cracking agents for some plastics. This means that the plastic becomes brittle and cracks easily when exposed to the agent. Some oils affect ABS this way.

The polyolefin resins such as polyethylene and polypropylene tend to be more resistant to chemicals than the styrenics — but the polyolefins may be subject to cold brittleness.

CALIBRATION. Checking the calibration of your spreader and recalibrating as needed is an important part of spreader maintenance. Many spreaders have some provision for checking the rate calibration to be sure the port openings are correct at some specified setting. Figure 1 shows a calibrating pin being used to check the port opening on a rotary spreader. The manufacturer supplies the calibrating pin and guidance as to what the setting should be to give a particular opening.

In some cases, spreaders can be recalibrated if the calibration check indicates a problem. In other cases, the calibration check points out the need for replacement of critical metering parts. Even if your particular spreader has no means of recalibration, you should check the calibration periodically so that you can replace the spreader before poor application causes a problem for you.

REPAIR. Sooner or later, your spreader is going to need repair. Professional lawn care service is rough on spreaders. Parts will wear out or break.

When your spreader needs repair, con-

tact the manufacturer for the proper replacement parts. It helps if you can provide the model number and serial number if there is one. Ask for installation directions for the parts you purchase.

As you remove old parts, be sure to note how the parts fit together. Many spreader problems are caused by improper reassembly. Even the location of washers can be important when you reassemble the spreader. A very common problem with rotary spreaders is to put the axle through from the wrong side, thus putting the large bevel gear on the wrong side. This makes the impeller turn backwards. The spreader will run, but the pattern will be atrocious. Incidentally, if an operator even complains about an extremely poor pattern, this is the first thing to check. On common professional rotaries, the impeller should turn counterclockwise when viewed from above.

Another critical area when reassembling rotary spreaders is to seat the axle washers correctly. The wheels and gears must turn freely without being sloppy, and most importantly, the axle must be shimmed properly to keep the impeller shaft vertical.

Tightening up the spreader gear is important, too. The gear must engage positively, without being excessively tight.

STORAGE. The final consideration in spreader maintenance is proper storage. A spreader should be stored in a cool, dry area with *no load on it*. A spreader hopper is not a storage bin. Plastics tend to "creep" if left under long-term loads. This means that leaving a plastic spreader in a loaded or stressed condition can cause the parts to take a permanent set.

Generally, the spreader ports should be fully open while the spreader is stored. This relaxes the load on the operating spring.

A spreader should not be stored in direct sunlight. Ultraviolet light can damage most plastics. When storing a spreader for the winter, be aware that some plastics do become brittle in cold weather. It is easy to crack plastic parts if they are bumped on a cold winter day.

SUMMARY. Proper maintenance is important, not only to protect your investment in your spreader, but more importantly, to protect your investment in time and products. Spreader maintenance is not difficult. It is a habit you definitely should cultivate. — *Richard L. Parish, PE.* ■

The author is a Consulting Engineer based in Baton Rouge, Louisiana.

AQUATIC WEED CONTROL

There is money to be made in aquatic weed control, but it requires a serious commitment to the service.

Aquatic weed control is big business. Consider this statistic. In Florida alone, where a great deal of aquatic weed control work is done, Dan Thayer, researcher and extension agent with the Center for Aquatic Plants in Gainesville, Florida estimates that expenditures from public and private work total \$20 million annually.

That money is being made by a rather small, tightknit group of professionals who grew up in the business together. For the most part, commercial aquatic weed control businessmen discovered a need for their services in the private sector after honing their skills in public works departments where they controlled aquatic weeds for the state.

"Almost everybody knows everybody else in the whole state," says Thayer. The business has experienced rapid growth in the last 10 years. Ten years ago, the few aquatic professionals who had acquired their expertise while working for the state were making a killing. Then those big businesses that serviced large areas of the state broke up as their employees in turn began to realize that they too could go into business for themselves and compete for their former bosses' customers.

Because the service is so specialized, Thayer says not

Thayer says that 90 percent of the job involves PR. And yet, he can say that the industry has never suffered an environmental suit in Florida because of misapplication.

many terrestrial plant professionals, like lawn care operators, have gotten involved with it. To offer the service, Thayer says a professional must know what makes a lake tick and then prove that to a Florida Department of Natural Resources official to get a permit. "If you go out there and treat at the wrong rate or treat too much of the lake at one time, with some of these contact herbicides, you can kill fish from a depletion of oxygen in the water," warns Thayer. "They have a system set up in Florida where they fine you per fish. You could go out of business quickly."

The aquatic weed control industry in Florida is policed by various agencies in various ways, agencies including the Department of Natural Resources, the Department of

Agriculture, and the Department of Environmental Regulation. The industry also polices itself through the Florida Aquatic Plant Management Society which currently has 1,000 members. The University of Florida also sponsors an aquatic weed short course to which most of the operators send their new people, according to Thayer.

Because of the sensitivity of the work, Thayer says that 90 percent of the job involves public relations. And yet, he can say that the industry has never suffered an environmental suit in Florida because of misapplication.

But the potential is there, since Thayer estimates that 80 percent of the aquatic weed control work done in Florida is done with herbicides. However, he says there is a growing trend toward the use of biological and mechanical controls with increasing regulatory and environmental pressures. There has been renewed interest in the use of mechanical harvesters which cut and dredge weeds from an area. There are also some opportunities to use the "draw-down" technique which simply involves draining the lake or pond to the point that the weeds are killed by dessication.

In recent years, professionals have acquired a new tool with the legalization of the sterile grass carp. This fish has proved itself an effective control of most submersed weeds in small bodies of water.

Of the eight herbicides labeled for aquatic use, Thayer notes five which are the most popular with professionals in Florida: Sonar[®], diquat, endothall, 2,4-D, and Rodeo[®]. Sonar is used primarily for submersed hydrilla plant problems. He says 2,4-D has recently come under fire from the local press, which is unfortunate because he says it is especially effective for hyacinth control. Rodeo is the aquatic formulation of Roundup[®].

"Rodeo is strictly for grasses and cattails, there are no submersed plants on the label," says Thayer. "Endothall and diquat are contact herbicides and if you have heavy, dense weeds, we use a sinking agent, which is a polymer designed to cut the surface tension of the water. We also use inverting oils and inject them into the water with lead-weighted trailing hoses."

Different bodies of water will react differently to herbicide treatments. "Deep, dark water might take the rest of the summer to reach the same biomass as before it was treated," notes Thayer. "If it is clear and shallow, you may have to treat that same area four times a year to keep it open." In general, when using contact herbicides for submersed plants, at least two applications will be ne-

cessary.

Different aquatic situations call for different treatment techniques. In slow-moving water, endothall and diquat can be used to cut boat trails. Diquat is very fast-acting, while Sonar is slow-acting. Sonar may take two months to clear an area of weeds, but Thayer says that area should stay open all year and well into the next year.

There are 75 to 100 commercial applicators using Sonar in Florida, according to Dave Tarver, Aquatic Specialist, Elanco Products Company, Tallahassee, Florida. Sonar is available in a liquid formulation and two pelletized formulations — one is a five-day release and the other is a seven- to 14-day release. The slower-release pellet was developed for areas that have water movement, according to Tarver.

Sonar is especially effective on hydrilla, according to Tarver, one of the most problematic aquatic weeds in Florida. "In many ponds, control has lasted a year or two for hydrilla, but some of the native plants are almost tolerant," reports Tarver. "It depends on which formulation is used and what time of year you use it."

Sonar is a systemic herbicide. Since it is translocated by the leaves and root-absorbed, it kills the entire plant. Many of the other materials are contact herbicides that burn the plants down to the soil surface, but allow them to grow back from root stock, according to Tarver.

Tarver agrees with Thayer that most of the professionals practicing aquatic weed control in Florida are specialists, not operators who have gotten into the business as a sideline. "I would say 95 percent of all the aquatic work done in this state is done by professional aquatic people, whether they work for the government or a private aquatic application business," states Tarver.

Tarver says most of the applicators use airboats with a conventional spray rig mounted on board. But the boom attached to the rig is fitted with weighted hoses that trail behind the boat rather than spray nozzles. "That is just for putting material down deeper in the water than you would get with a surface application," explains Tarver. "It is really most effective when you treat early in the year when the plants are not on the surface."

Commercial applicators price this service in a variety



of ways. Some applicators will treat only once per season and charge from \$50 to \$200 just to make the application, not including the herbicide cost. But more commonly, Tarver says applicators will treat once to get the plants under control and then they sign a maintenance contract — much like a lawn care business. A monthly treatment may be necessary in the case of an algae problem, while other weed problems will require quarterly treatments. Most companies charge by the acres treated, but the cost in traveling to the site and then reaching the area to be treated is also factored into the equation.

Tarver notes that northern aquatic professionals are "more into total lake management than the private applicators are here. They survey the lake, tell the homeowner what is there, test the water quality, and recommend a weed control program." He says aquatic weeds grow so fast in the Southeast that operators have their hands full just trying to keep their growth maintained. "I would guess that probably two-thirds of the aquatic plant business in the United States is in the Southeast."

Ecoscience, headquartered in Moscow, Pennsylvania, is a prime example of the northern aquatic weed control company. President Russell James describes his operation as "environmental consultants who specialize in lakes and ponds." He does both chemical and mechanical aquatic weed control, and in addition to that he does "septic leachate studies, nutrient budgets, and bacteriological monitoring." In other words, if you own or live on a lake, he can take care of all your aquatic needs.

creases in recent years. "Our insurance, and other people in this business whom I have spoken to, have experienced increases of 500 to 900 percent over the last two years," says Gilbert. Although his firm has 30 years of experience in the field, it took him a year and a half to find a carrier to cover him.

As bleak as the situation may sound, there is a way to sidestep the liability and regulatory hassles associated with chemical aquatic weed control. While herbicides are still the dominant control

sant to walk on, unlike a mucky lake bottom. There are no permits required for those who install these materials and the weeds won't grow back.

"Once you have put the screen down, you have solved your problem for at least 10 years," claims James. He says they are so durable that they can even be spread across boat launch ramps. They are ideally suited for lakefront property owners who want to cover a dock region. James buys the material for 15 cents a square foot, which means a roll 20 feet by 50 feet would cost \$150. If it remains intact for 10 years, its cost is only \$15 a year. He charges 35 cents per square foot to install the screen, which includes material, labor, and follow-up service — to adjust the screens if they need it.

Despite the expense and difficulty in maintaining insurance coverage, James does offer his customers chemical aquatic weed control. The three airboats he uses are set up to apply chemicals in three different ways: liquids from spray guns, liquids from trailing hoses, and pellets from an electric spreader mounted on the bow. Which application method they use depends on the body of water and the weather.

"On a windy day, you wouldn't want to surface spray," explains James. "If you inject with the trailing hoses, you get less drift. So if you want to treat certain areas along the shoreline, you don't want it to drift down into the nursery areas where the fish are spawning because if you take the weed beds out the fishermen are going to complain."

CONCLUSIONS. If you were considering aquatic weed control as a sideline to your lawn care or lawn maintenance business (and have even continued reading this far), you have probably become discouraged. Because the service requires a knowledge of a whole new environment, to successfully offer it would require a commitment to staff an entirely new division of your company with at least a core of trained aquatic specialists.

Given that level of commitment, everyone we spoke with said an industry outsider would still find the challenge of finding and then funding aquatic liability insurance a nearly impossible task. However, while mechanical control tools may not take the place of chemical controls in every instance, it occurs to us that a substantial reliance upon mechanical rather than chemical controls could ease the insurance crisis. At any rate, the untapped potential of this market in many areas would at least suggest that the start-up pains could well be negated by substantial long-term gains. — *Tim Weidner* ■

The author is Editor of ALA magazine.

Harvesting is a more expensive process. James charges about \$100 to \$200 per acre for chemical weed control, while he charges anywhere from \$250 to \$400 per acre for harvesting. He generally charges for this service by the hour at \$75 to \$95 per hour, depending on the amount of time required.

James discovered there was a market for his service while doing an internship with the state during the early 1970s. His bachelor's degree in freshwater biology gave him the expertise to perform aquatic weed control, but his business sense told him that there was a void in his region that he could fill. "And I have been living happily ever after," reports James.

He currently does work in six states with three spray crews and two mechanical weed harvesting crews. At the peak of his season he employs 15 to 20 technicians. "We try to identify the beneficial plants that you want to keep in the lake and target the weed species for control," says James.

Needless to say, aquatic weed control is a complex service which requires a great deal of expertise to perform thoroughly. "The aquatic applicator can magnify the concerns of the lawn care applicator one hundred-fold," says James. "For a turf company to really think seriously about the aquatic business is a major event. The bulk of them who have thought about doing it just wrote it off."

Regulatory and insurance concerns that are unique to the aquatic weed control business would be major stumbling blocks to the lawn care professional considering a sideline in aquatics. "If they mentioned to their insurance company that they were thinking of putting chemicals in water, they would probably get their rate increased," says James. "A lot of the people who did that 10 years ago used firms like mine to give their clients that service so they wouldn't have the expense and the liability associated with it."

Many aquatic weed control specialists, according to Charles Gilbert, President of Allied Biological in Newark, New Jersey, have experienced huge insurance rate in-

creases in recent years. "Our insurance, and other people in this business whom I have spoken to, have experienced increases of 500 to 900 percent over the last two years," says Gilbert. Although his firm has 30 years of experience in the field, it took him a year and a half to find a carrier to cover him.

As bleak as the situation may sound, there is a way to sidestep the liability and regulatory hassles associated with chemical aquatic weed control. While herbicides are still the dominant control tools, are the least expensive alternative, and are the only feasible alternative in some situations, mechanical controls may present attainable opportunities. Mechanical aquatic weed controls like harvesters or benthic screens have begun to get a more favorable reception in light of current environmental concerns. James purchases his harvesters from a Wisconsin company called Aqua-Marine. Their harvesters have paddle wheels for propulsion and hydraulic cutting knives and conveyor meshes that cut the weeds down to a depth of 6 to 7 feet. The cut weeds are pulled up a conveyor mesh and dumped into a bed on board which holds about 200 cubic feet. A separate off-loading conveyor transfers the weed cuttings to a shore conveyor that in turn puts it in a dump truck, according to James.

Harvesting is a more expensive process. James charges about \$100 to \$200 per acre for chemical weed control, while he charges anywhere from \$250 to \$400 per acre for harvesting. He generally charges for this service by the hour at \$75 to \$95 per hour, depending on the amount of time required to do the job. "If you contract for a lot of hours, the rate is a little lower," explains James. The equipment is expensive and more labor-intensive, but it does solve the environmental sensitivity issue and the liability associated with applying herbicides to bodies of water.

A second mechanical aquatic weed control alternative is benthic or bottom screens. These screens are spread out and fastened to the bottom of a lake or pond wherever weed control is desired. James uses a product called Texel. "It is denser than water so it will sink," explains James. "It is gas-permeable so the bottom gases do escape." He says it is plea-

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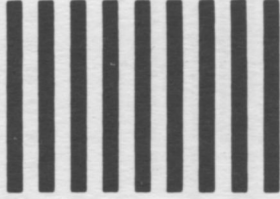
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(continued on page 44)

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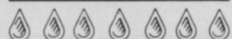
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(continued from page 40)

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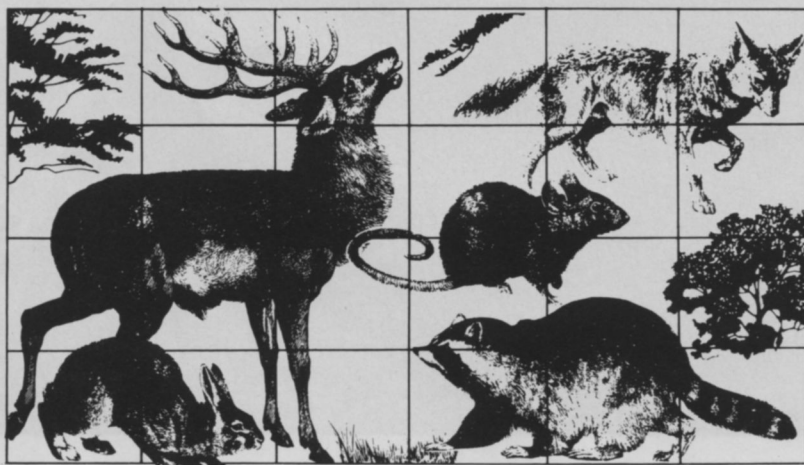
Although care must be used when using any herbicide, Rodeo is considered essentially nontoxic to fish, wildlife, or humans when applied according to label directions. It has no residual activity, is non-volatile, is biodegradable into natural elements, and does not accumulate in the food chain.

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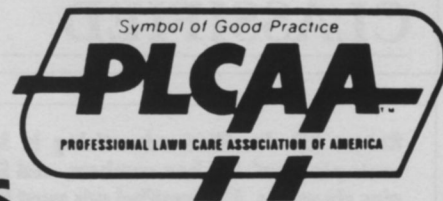
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FOR THE APPLICATOR / TECHNICIAN:

Applicator Training: Safety and Emergency Procedure Techniques

5:30 PM to 7:30 PM – This early evening session is targeted to the applicator's role in safety and hygiene, and features the latest in application techniques and approved emergency procedures. The emphasis is on practical training, complete with demonstrations and role playing. A mock spill offers hands-on emergency training. The early evening program format avoids cutting into regular work schedules.

Outdoor Demonstration

4 PM to 5:30 PM – This is your chance to see what's new in lawn care equipment. Local distributors will be on hand to display and demonstrate their product line. Touch, try out and compare before you buy.

Applicator Safety Week

JUNE 1-5, 1987

Bring the message of Environmental Awareness home to your employees by structuring your own **Safety Week**. A *PLCAA Guidebook on Environmental Awareness* outlines an in-house training program for your employees, including five 15 to 30 minute sessions on safety. Alternately, run these sessions during the same week as PLCAA's 1987 Regional Seminar in your area and you have the impact of an entire week of safety awareness.

Environmental Awareness Certification

Upon completion of the Applicator Seminar and a written test, applicators will receive a **PLCAA Certificate of Applicator Environmental Awareness**.

Chuck Wagon Dinner

4 PM to 5:30 PM – Enjoy Tex/Mex food while viewing the indoor and outdoor exhibits – a fun time and a preview of the spirit of November's upcoming PLCAA Conference and Show in San Antonio, Texas.

PRE-REGISTER NOW!

Dates and Locations of PLCAA 1987 Regional Seminars

(Check the box with your choice)

- | | | | |
|---|---------|--|---------|
| <input type="checkbox"/> Atlanta, GA | June 11 | <input type="checkbox"/> St. Louis, MO | July 28 |
| <input type="checkbox"/> Washington, DC | June 18 | <input type="checkbox"/> Kansas City, MO | July 30 |
| <input type="checkbox"/> Philadelphia, PA | June 23 | <input type="checkbox"/> Oklahoma City, OK | Aug 11 |
| <input type="checkbox"/> Hartford, CT | June 25 | <input type="checkbox"/> Dallas, TX | Aug 13 |
| <input type="checkbox"/> Rochester, NY | June 30 | <input type="checkbox"/> Minneapolis, MN | Aug 18 |
| <input type="checkbox"/> Cleveland, OH | July 2 | <input type="checkbox"/> Bolder, CO | Aug 20 |
| <input type="checkbox"/> Detroit, MI | July 14 | <input type="checkbox"/> Indianapolis, IN | Sept 1 |
| <input type="checkbox"/> Cincinnati, OH | July 16 | <input type="checkbox"/> Oakland, CA | Sept 22 |
| <input type="checkbox"/> Chicago, IL | July 23 | <input type="checkbox"/> Los Angeles, CA | Sept 24 |

FEES

ATTENDEES (indicate number)

PLCAA MEMBERS

— Owner/Manager(s) at \$25 ea. \$ _____

— Applicator/Technician(s) at \$10 ea. \$ _____

NON-MEMBERS

— Owner/Manager(s) at \$35 ea. \$ _____

— Applicator/Technician(s) at \$15 ea. \$ _____

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HELP WANTED

Career Opportunities—

ChemLawn is now accepting applications for the positions of Lawn Specialist in our expanding Florida markets. Join the Nation's Leader in Lawn Care. Send resume to ALA, Box 323, 4012 Bridge Avenue, Cleveland, Ohio 44113.

HOT PROPERTY?—

We are looking for managers to fill key positions in several locations throughout the country. Lawn care, tree and shrub care managers are needed now. Let us help you find the management position that fits your skills and salary needs. All inquiries are confidential.

Call or write: Beecher Smith, 301/253-5787. **Green Industry Resources Corporation** 25230 Conrad Ct., Damascus, Maryland 20872.

Help Wanted?—

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Hannay reels new in-the-box, E1526s, E1530s, \$339; lawn spray hose, 275 psi and 600 psi, all sizes; original Imler measuring wheels, \$48; glycerin-filled gauges, 0-60 psi to 0-1,000 psi, \$19.95; polypropylene ball valves, 1/2-inch to 2-inch; ChemLawn guns, \$75.95; lawn spray boots, \$16.95; lawn spray gloves, \$1.25-pair.

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Stainless Steel Tank Bodies available. Four pots each, 800 gallon and 1,000 gallon with dry storage to mount on your chassis. \$2,000—\$3,000 or offer. Call Jim Doll—301/840-5500.

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For Sale—

Salsco 30-6 core aerator \$2150, excellent condition, two years old, call or write: Action Lawns, 605/665-8468, 1608 Pine, Yankton, South Dakota 57078.

For Sale—

Hahn Multi Pro 44 Vehicle. 16 horsepower Kohler, 3-speed hydrostatic drive, centrifugal pump, boom spray attachment, 160 gallon tank, Vicon Granular hopper 1,000-pound capacity, only 82 hours on the machine. Sells new for \$13,000.00. Will sell for \$7,500.00 with new tilt trailer. Delivery available. Harmon and Sons Lawn Care Specialists, Ogden, Utah; 801/776-5149. ■

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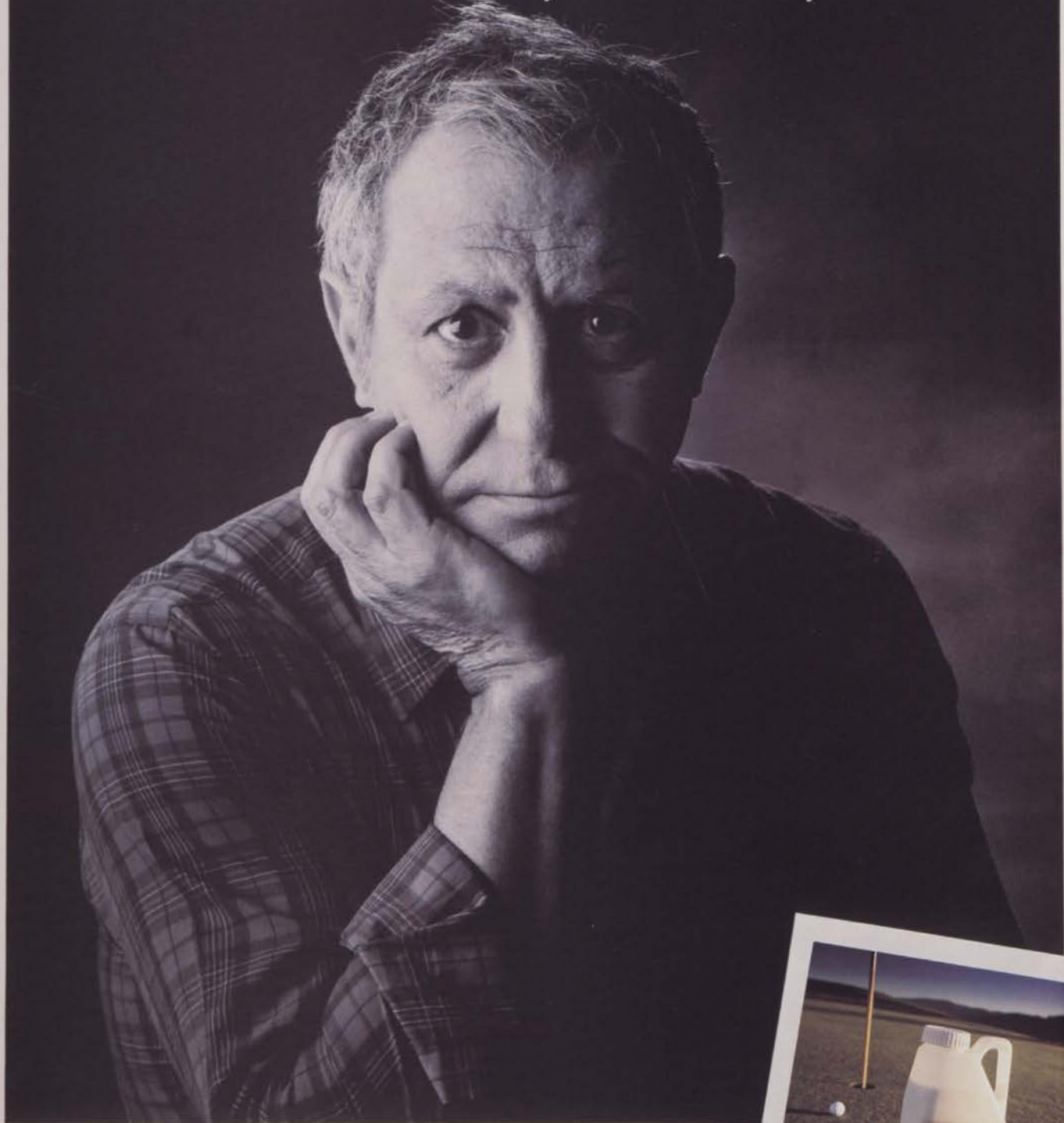
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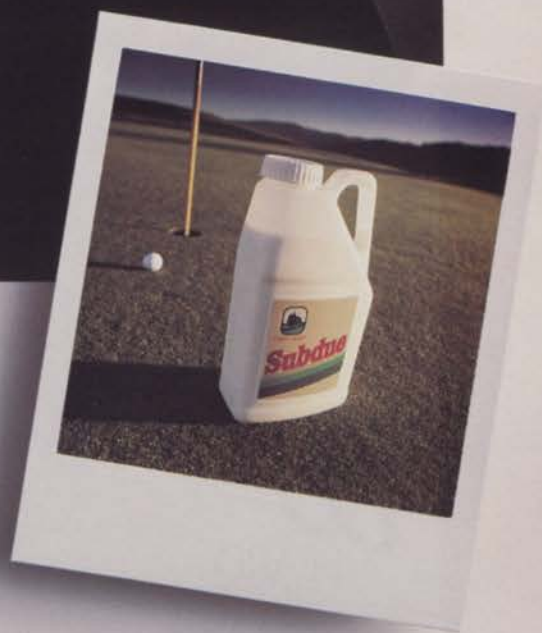
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