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May 1985 • \$1.25

ALA

TURFSEED TECHNOLOGY REPORT

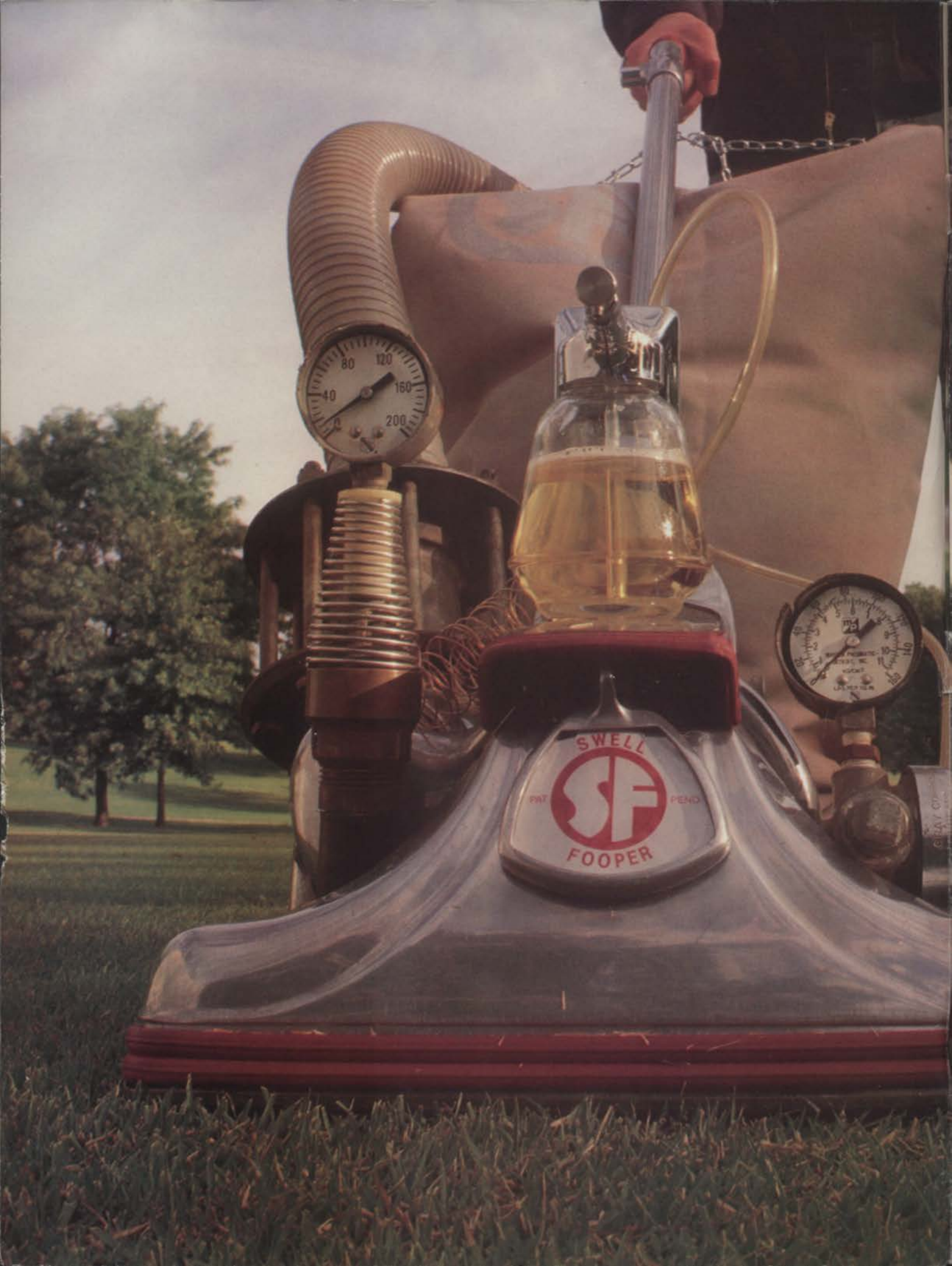
TREATING ECTOPARASITES OUTDOORS

ALSO IN THIS ISSUE:

**TWO-LINED SPITTLEBUGS
ON SOUTHERN TURF**

**CONTROLLING MOLES
WITH FUMIGATION**

4-77843-TEXAS-4C 0000L000
DR. JAMES B. BEARD
DEPT OF SOIL & CROP SCIENCES
TEXAS A&M UNIVERSITY
COLLEGE STATION TX 77843



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ABOUT SURFACE
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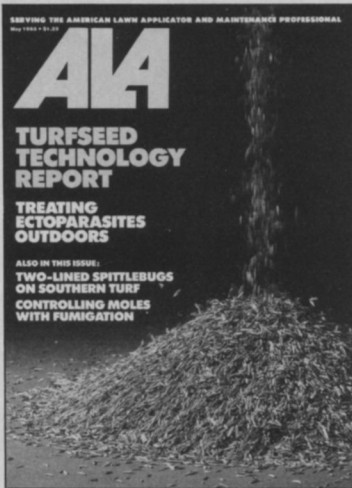
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ABOUT MOLE CRICKETS.**



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Specialty Products Group
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MAY 1985
VOLUME 6 NUMBER 5

THE COVER

What are turfseed harvest yields like this year and what effect will they have on 1986 pricing? Find out in this month's cover story which profiles leading seed growers and their latest proprietary varieties available to the lawn care industry, beginning on page 46.

CALENDAR

July 11-13

California Landscape Contractors Association Family Summer Tri-Board, Contact: Bob A. Gouley, California Landscape Contractors, 2226 K Street, Sacramento, CA 95816; 916/448-CLCA.

July 16-17

Northwest Plant Food Association 36th Summer Fertilizer Conference, Salt Lake City, UT. Contact: Northwest Plant Food Association, 503/226-2758.

July 23-25

National Fertilizer Solutions Association 1985 Round-Up, Indiana Convention Center, Indianapolis, IN. Contact: Dennis E. Brown, National Fertilizer Solutions Association, 8823 North Industrial Road, Peoria, IL 61615; 309/691-2870.

July 25-28

Family Summer Tri-Board, Harbortown Marina Resort Hotel, Ventura, CA. Contact: Larry Rohlfes, CLCA, 2226 K Street, Sacramento, CA 95816; 916/448-CLCA.

July 29-31

International Lawn, Garden & Power Equipment Expo, Kentucky Fair & Exposition Center, Louisville, KY. Contact: Polly Moter, Kentucky Fair & Exposition Center, P.O. Box 37130, Louisville, KY 40233; 800/558-8767; or Lin Fish, Fleishman Communications, 312/397-7744.

Sept. 29-Oct. 2

1985 Florida Turfgrass Association Annual Conference and Show, Curtis Hixon Convention Center and Hyatt Regency, Tampa, FL. Contact: Bill Nass, Florida Turfgrass Association, 302 South Graham Avenue, Orlando, FL 32803-6332; 305/898-6721.

BUSINESS FEATURES

Many Applicators Now Under RCRA Regs

New EPA regulations affect organizations that produce between 220 and 2,200 pounds of hazardous waste.

21

Turfseed Technology Report

ALA talks with leading seed growers about harvest yields and the latest varieties available to lawn care operators.

46

Treating Ectoparasites Outdoors

Assistant Editor Vivian Fotos probes the viability of flea, tick and/or mosquito control as an add-on service.

55

TECHNICAL ARTICLES

Controlling Moles with Fumigation

Jeffrey Benjamin tells us how to control moles with Phostoxin.

30

Alternatives to Turf in Shade

Elton Smith describes groundcovers for shaded areas.

36

Two-Lined Spittlebugs on Southern Turf

Dr. Patricia Cobb presents new information on the turf-pest status of this insect.

62

DEPARTMENTS

Advertiser's Index	64
Classified	64
Inside Story	8
Letters	12
News in Brief	14
People	20
PLCAA Update	20
Products	60
Publisher's Feedback	6

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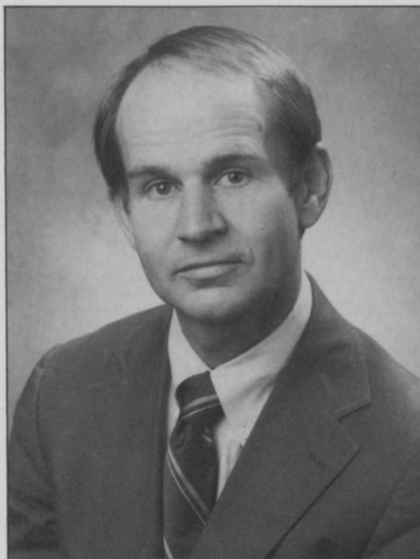
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ALA PUBLISHER'S FEEDBACK

This issue marks the first anniversary of our acquisition and expansion of ALA magazine. It was only last May that we redesigned ALA and dramatically expanded its editorial, circulation and publishing frequency. During this past year we've published 38 technical features comprising over 140 pages of exclusive technical research related to all facets of lawn service technology. We've also published 26 business features covering a long list of management subjects as well as timely and sometimes controversial issues affecting lawn service operators nationwide.

Needless to say, our editorial expansion has not gone unnoticed by the industry, in fact, we regularly receive comments of praise and amazement about how rapidly ALA has grown this past year, which is a reflection of our growing readership and high value to suppliers/advertisers. In the past year ALA's advertising volume has more than doubled over the previous year. We currently carry more exclusive advertising accounts than any other magazine serving the industry.

ALA's circulation expansion has also been very rewarding. Not only do we have the largest circulation coverage of the field, but we have made significant progress in implementing our paid subscription policy over the period. Today, ALA's paid subscription circulation is



three times larger than any other magazine serving the industry. In the months ahead we will become even more aggressive in expanding the paid subscription policy, removing those subscribers who have ignored or overlooked our qualification and subscription payment notices and replacing them with businessmen who are willing to pay a modest \$12.00 per year for the exclusive research we publish monthly.

Earlier this year, we implemented an editorial advisory board consisting of: Gordon La Fontaine, president of

Lawn Equipment Corporation; Dr. William Meyer, president of Pure-Seed Testing; Des Rice, president of The Weed Man, Ltd.; Dr. Al Turgeon, vice president of Research and Technical Services, Tru Green Corporation; Dr. Joseph Vargas, professor of Botany and Plant Pathology, Michigan State University; and Dr. Patricia Vittum, professor of Entomology, University of Massachusetts. All of these individuals are highly respected leaders in research and business who have made a commitment to work closely with us in continuing our expansion of ALA.

The substantial investment we've made in expanding your magazine this past year will continue as we strive to provide greater value to you, our readers and advertisers. ALA is still very young, but our commitment is long-term. Although we are currently considered the leading technical magazine in the market, we have a long-term goal to be the leading magazine in every category of industry service ... so keep reading and watch us grow!

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**HOW TO AVOID SLEEPLESS NIGHTS
DURING PYTHIUM WEATHER.**

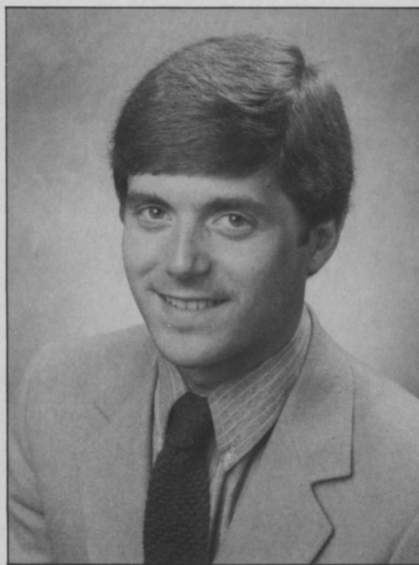
SUBDUE

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ALA INSIDE STORY

Our cover story this month is an overview of this year's turfseed market. Every year there are shortages in certain varieties of turfseed and this year is no exception. Depending on which seed grower you might talk to, there will be continuing shortages of bluegrass, ryegrass or tall fescues. But the bottom line is that if you make enough inquiries with enough turfseed producers, you will be able to find virtually any type of turfseed you are looking for. Turn to page 46 and find out who has the turfseed you need.

Assistant Editor Vivian Fotos filed the story on "Treating Ectoparasites Outdoors." In this context, ectoparasites refer to such beasts as mosquitoes, ticks and fleas which attack homeowners and their pets. We found that treating ectoparasites in the landscape is not popular with lawn care professionals. Some operators who have tried this service say the season is too short and the pests themselves are too difficult to control, yet others claim the service has potential. Turn to page 55 and



decide for yourself if outdoor ectoparasite control could be an add-on service for your company.

On page 21 we have a report on the ramifications of the new Resource Conservation and Recovery Act (RCRA)

regulations for the lawn care industry. As of August 5 of this year, RCRA will include anyone who generates 100 kilograms (220 pounds) or more of hazardous waste per month — that could mean you! We talked with EPA officials to get the details on this important piece of legislation for all generators of hazardous waste. If you don't believe Big Brother is watching, you had better read this article!

Finally, as always, we have an informative selection of technical features to keep you in tune with the mechanics of your business: "Controlling Moles With Fumigation" by Jeffery D. Benjamin, Fumigation Service and Supply, Inc.; "Alternatives to Turf in Shade" by Elton M. Smith, Ohio State University; and "Two-lined Spittlebugs on Southern Turf" by Dr. Patricia P. Cobb, Auburn University.

Tim Weidner



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TAKE A LOOK.

If you haven't checked out the Professional Lawn Care Association of America recently, then you're in for a surprise. We're offering a bundle of

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- ✓ **NEW! PLCAA Safety Manual.** Emergency procedures, pesticide safety procedures, inspections, health programs and more—a complete, practical safety guide for reference and technician training.
- ✓ **NEW! PLCAA Management Monograph Series.** In-depth, easy to understand reference booklets on subjects vital to the operation of your business.
- ✓ **NEW! Legal Update Bulletin.** An exclusive monthly bulletin for members. Edited by PLCAA Attorney, Richard I. Lehr, and focused on tax, investment, labor, and legal information of interest to the industry.
- ✓ **NEW! Public Issues Alert Committee**—continually updates the membership on regulations and legislation—local, state, and national—that affect the lawn care industry. A resource for understanding and involvement in the public issues vital to the future of your business.
- ✓ **Plus a Whole Lot More...** PLCAA membership offers, in addition to these new benefits, an impressive lineup of publications and programs that are invaluable to any lawn care business: • **PLCAA Technical Resource Manual.** An important guide for helping to operate your business on a professional and agronomically sound basis. • **Turf Talks,** PLCAA's bi-monthly member newsletter. • **PLCAA Regional Seminars.** Intensive, one-day sessions offered on a regional basis and at a reduced fee to members. • **Annual PLCAA Conference and Show.** The week-long gathering of the best in lawn care that has become the one must convention of the year. • **The Professional Lawn Care Credit Association**—On hand to help you meet your delinquent account collection needs. • **Insurance Clout**—Comprehensive Property and Casualty Insurance that offer members excellent protection at competitive rates.

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ALA LETTERS

FRANCHISE OVERSIGHT

I am writing about the cover story in your February issue on franchising in the lawn care industry. I found your article interesting, but am curious as to why your research did not include Lawn Doctor, Inc. I would like to give you a little background on our company.

Lawn Doctor, Inc. is the largest franchisor in the lawn care industry. We have been franchising since 1967. We have approximately 300 franchises operating in 25 states. Our dealerships range in size from new owners just starting out to long-established units with over \$1 million in gross sales. We are active members of the International Franchise Association and the Professional Lawn Care Association of America.

I feel that a franchise offers many benefits to a lawn care businessman. A franchise system can provide many services and supports that are difficult for independent operators to duplicate. I agree with your advice to prospective franchise owners that it is very important for them to carefully research all aspects of a franchise. It is in the best

interest of both franchisor and franchisee to develop a good working relationship.

I also feel it is important for trade publications to carefully research their topics. It is important to make sure all of the facts are presented. I am disappointed that your franchising piece did not include Lawn Doctor, Inc., and I invite you to call me to discuss franchising for any future work you may do on this topic. I also invite you to call me to discuss other topics of importance in our industry. I think businessmen and journalists also need good working relationships.

*Russell J. Frith
President
Lawn Doctor, Inc.
Matawan, NJ*

We certainly regret this oversight, but I will be sure to take you up on your offer to discuss future lawn care topics. Ed.

LD50 CONFUSION

In your January 1985 issue of *ALA*, I noticed a misprint that I feel needs to be brought to your attention. The article on page 16 entitled, "Retail Pesti-

cide Safety Questioned by Study," states that "acephate is considered a relatively 'safe' pesticide with a very low LD50." I believe the article should have read high LD50, since the lower your LD50, the more toxic a chemical becomes.

*Richard Packard
California Farm Bureau Federation
Sacramento, CA*

Thanks for clearing up some confusion. Continue to keep an eye on us! Ed.

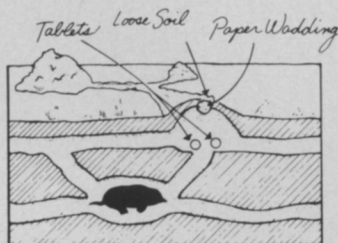
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*Keith Hundt
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MICHIGAN APPLICATORS BATTLE NEW BILL

Rapid growth and development of the lawn care industry has been accompanied by increasing pressure from various environmental groups and individuals to modify the methods employed by lawn care firms in conducting their operations. Legislation has been introduced at municipal, county, and state levels that would require posting of signs or written notification to adjacent residences, in conjunction with each agrichemical (fertilizer, pesticide) application.

In Michigan, Senate Bill 730 was introduced in 1984 (reintroduced as SB 65 in 1985), requiring, if passed, written notification to all residences within a 1,000-foot radius of each application site at least 24 hours prior to the application of agrichemicals by lawn care operators. The bill was authored by State Senator Richard Fessler (Republican) of West Bloomfield Hills, and presented to the Forestry and Agriculture Committee for consideration. A public hearing on this and other proposed legislation was held last November 14 with Senators Nick Smith, chairman, and Harvey Cropsy of the F&A Committee in attendance.

The hearing was well attended with numerous proponents and opponents of the bill participating. Only proponents testified, however, as opponents collectively decided to submit their positions in writing to the committee. Participants in favor of the bill who testified included Senator Fessler; Dr. Paula Davies, a clinical ecologist from Ann Arbor; Edward Parker, an attorney from Flint; Edward Pfiffer, an environmentalist from Ann Arbor; and several of Dr. Davies' patients. Their

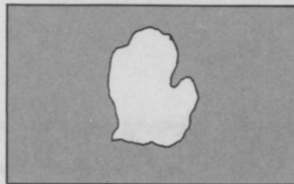
arguments primarily dealt with the issue of petrochemical sensitivity and the presumed effect of lawn chemicals on sensitive residents living in the vicinity of treated lawns.

Senator Fessler stated that he was acting on behalf of numerous constituents claiming to be adversely affected by materials applied by lawn care firms. His position was that something had to be done to protect petrochemical-sensitive people wherever and whenever lawn spraying operations were conducted, and that his bill was simply one alternative for effectively dealing with the problem.

Dr. Davies presented an intriguing array of arguments against pesticides that were reminiscent of Rachel Carson's "Silent Spring." She claimed that in sensitive patients, recurrent flu, shortness of breath, memory loss, and other maladies are direct results of pesticide exposure. She further stated that sensitivity to pesticides could result from a single, large exposure or from multiple, small exposures. Finally, she claimed that, with at least 20,000 new cases being reported each



Dr. A.J. Turgeon



year, the number of pesticide-sensitive people in the United States was increasing rapidly.

Opponents of SB 65 included representatives of lawn care firms and various professional associations in Michigan. Their principal arguments presented in their position papers dealt with the adverse economic impact of the bill, and the relative safety of professionally applied pesticides over application by homeowners of the same materials readily available at garden centers and other retail outlets. The position papers further emphasized that all pesticides used by the lawn care industry were adequately tested and regulated by federal and state agencies.

Dr. Donald Kaufman, an immunologist at the Michigan State University (MSU) College of Medicine, stated that petrochemicals are non-allergenic substances, and that most of the data cited by "environmentalists" are from studies which were not well designed scientific experiments. Furthermore, emotional and psychological responses to petrochemicals may enhance the allergic-type reaction, thus magnifying any true sensitivity that might exist.

To explain the kind of conditioned response that can occur in petrochemical-sensitive patients, he cited a classical experiment conducted with dogs. First, the animals were injected with bovine serum albumin, a chemical agent that induces a dramatic but short-lived allergic response. Then, the injections were accompanied by exposure to

a chemical with a strong odor. Finally, the animals were subjected to the odor without an injection. In the third phase of the experiment (i.e. odor only, no injection), the animals reacted with the same allergic response as from the injection. The reaction was a conditioned response learned from previous experience. This phenomenon suggests that, for petrochemical-sensitive people, the sight of a lawn tanker truck may be sufficient to induce a painful reaction even though no chemicals are being sprayed.

Dr. Kaufman's remarks provided important insight into the problem of petrochemical sensitivity. First, the problem is difficult to diagnose due to the lack of scientific data and reliable techniques for accurately assessing the real cause of the problem. Second, it is difficult to distinguish between physiologically- and psychologically-based phenomena.

However, Dr. Kaufman believes that the problem is largely psychological in nature, and that psychological counselling is an important part of the treatment of petrochemical-sensitive patients.

Following a general discussion of the issues presented at the meeting, the group decided to: 1) develop a summary of the information covered at the meeting; 2) form a "Task Force" to develop a strategy for effectively dealing with the issue of petrochemical sensitivity; and 3) initiate an educational program for presentation to members of the industry. — Dr. A.J. Turgeon

Dr. Turgeon is Vice President for Research and Technical Services of Tru Green Corporation in East Lansing, Michigan. Currently, he is a member of the Board of

(continued on page 16)

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NEWS

(continued from page 14)

Directors of the Michigan Turfgrass Foundation, as well as a member of the American Society of Agronomy, Crop

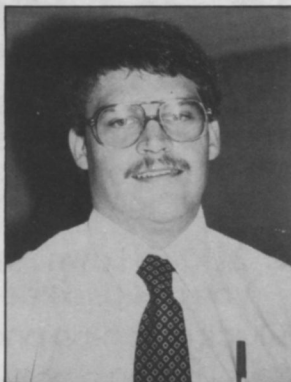
Science Society of America, International Turfgrass Society, Council of Agricultural Science and Technology and ALA magazine's Editorial Advisory Board.

OHIO APPLICATORS FORM USER GROUP

Ohio Pesticide Applicators for Responsible Regulation (OPARR) announced the formation of their new organization to educate the general public, do-it-yourself pesticide applicators and public officials about the essential nature of pesticides in today's society. The new organization also hopes to work with legislative bodies for responsible regulation of pesticide use.

Lauren N. Lanphear, vice president of Forest City Tree Protection Company, Cleveland, OH was recently elected chairman of the Board of Trustees of

OPARR. Lanphear reports that a non-profit corporation has been formed for OPARR, a Board of Trustees was



Lauren Lanphear

elected and efforts have begun to develop a broad-based membership and effective public information campaign.

"Our concern," says Lanphear, "is that misinformation and lack of knowledge can precipitate excessive and burdensome regulation on an industry that has become an essential part of today's society. We support responsible regulation of the pesticide application industry, but want to avoid the kind of overregulation that could deny the public easy access to necessary pesticide control services."

Lanphear reports that OPARR has attracted the support of individuals and corporations from the lawn care industry, pest control industry, agriculture and chemical distribution and manufacturing industries, tree protection, nursery and landscaping industry, among others. "Our Board of Trustees contains members from all parts of Ohio, and individuals or

corporations representing most of the various aspects of the pest control industry," says Lanphear.

Other members of OPARR's Board of Trustees include Lonnie Alonso, Columbus Pest Control, Columbus; Bruce Bollinger, Landmark, Inc., Columbus; Rick Steinau, Greenlon Environmental Services, Cincinnati; Gary Stewart, SDS Biotech Corporation, North Canton; George Gossett, Dow Chemical Company, Strongsville; and Robert Styduhar, ChemLawn, Inc., Columbus.

LAWN CARE IN THE NEWS

In case you hadn't noticed, lawn care has been getting some coverage in the national media recently, some good, some bad. Some good lawn care news was reported recently in the national newspaper *USA*

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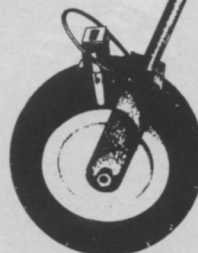
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Today. The paper reported that over eight million homeowners in the United States and Canada hire companies to keep their grass green. These companies have been recording a 25% average annual growth rate since 1977 and number about 5,000 small businesses and 43 larger businesses.

Also included in the article were 1984 gross sales figures for some of this industry's leading companies: \$248.8 million, ChemLawn Corporation, Columbus, OH; \$32 million, Tru-Green Corporation, East Lansing, MI; \$1.5 million, Nitro-Green Corporation, Bismarck, ND; \$7.7 million, Spring Green Lawn Care Corporation, Naperville, IL; and \$10 million, Davey Lawnscape, Kent, OH. President Russ Frith, Lawn Doctor, Inc., Matawan, NJ, reported his company's sales this year are running 40% ahead of revenues for the same period in 1984.

But more important than

Lawn Care Industry

Company	1984 sales	Customers
ChemLawn Corp.	\$248.8 million	100,000
Tru-Green Corp.	\$32 million	100,000
Nitro-Green Corp.	\$1.5 million	100,000
Spring Green Lawn Care Corp.	\$7.7 million	100,000
Davey Lawnscape	\$10 million	100,000

COVER STORY

Lawn-care companies taking root

Concerns about health lead to calls for regulation, EPA says chemicals OK

By Ron Spector
USA Today

ENGLISHTOWN, Pa.—The quiet prosperity of about 5,000 lawn care companies that keep people's lawns green is being called into question by a new wave of concern about the chemicals they use. The U.S. Environmental Protection Agency (EPA) says it is looking at the chemicals used in lawn care, but says it has no reason to believe they are dangerous to people or the environment.

The EPA is not alone in questioning the industry. In the past few years, several states have passed laws requiring lawn care companies to use safer chemicals. In California, the state has passed a law requiring lawn care companies to use safer chemicals. In California, the state has passed a law requiring lawn care companies to use safer chemicals.

an acknowledgement of the lawn care industry's prosperity was the very positive treatment of the "right-to-know" issue at the end of the article. Although some negative comments from Lyndhurst, OH Vice Mayor Joan Klein were

listed, it was also mentioned that many residents support the application of lawn care pesticides by professionals since the professionals are using the same chemicals they can purchase at hardware stores. It was also noted that lawn care chemicals are classified by the EPA "For General Use" because they are safe for use in and around the house. ChemLawn's excellent safety record over its 16-year history was also mentioned.

At the opposite end of the media's reporting on the "right-to-know" issue was a recent article from *The Associated Press* that ran under the headline, "Deadly Spray." Although the story listed assertions from unnamed ChemLawn and Lawn Doctor executives that lawn chemicals in solution are less toxic than aspirin or caffeine, it was certainly less "pro-lawn care" than the *USA Today* story. The article was basically a report on the situation in

Wauconda, IL, where a federal judge will decide by June 21 whether or not that town's sign-posting ordinance will stand.

Presenting the applicator's side of the story were David Dietz, director of the Pesticide Public Policy Foundation (3PF) and Dr. Edward Calabrese, a professor of toxicology at the University of Massachusetts. On the anti-pesticide side of the ledger were Dr. Samuel Epstein, author of the book, "The Politics of Cancer;" June Larson, who spearheaded passage of the Wauconda ordinance; and Mary O'Brien, spokesman for the Northwest Coalition for Alternatives to Pesticides, Eugene, OR.

Dietz argued that state laws already regulate this industry adequately. Calabrese said, "The (Wauconda) ordinance, generally speaking, is an overreaction by the general public stemming from an exaggeration of the

(continued on page 18)

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NEWS

(continued from page 17)

perceived risks."

Among other things, Epstein said, "In the deadly battle against the fierce dandelion, is it worth spreading around these toxic chemicals?" Larson

has reportedly fought for 27 years to limit the use of pesticides which aggravate her handicapped daughter's allergy to them. O'Brien said, "Those people who feel the toxicologists who are warning of the danger are correct, have a right to get out of the way."

VA EXTENSION SERVICE COMPILES TURF SURVEY

The 1982 Virginia Turfgrass Survey has just been printed, but the results are well worth the wait. The survey charts expenditures and revenues for all segments of Virginia's turf market, but we will only excerpt some figures from the "Lawn Maintenance Firms" section. This survey marks the first time Virginia lawn care companies have been surveyed. The 203 companies surveyed included mowing maintenance firms, but

excluded those whose primary income is derived from landscaping and ornamental shrub maintenance.

Lawn maintenance firms had gross receipts of \$40.8 million in 1982. Seventy-one percent of the total receipts, or \$29 million were from chemical lawn maintenance and fertilization. Mowing services generated \$8 million, nearly 20 percent of the total gross receipts. Residential accounts

amounted to 79 percent of the revenues and commercial accounts for most of the rest — government accounts generated about 1 percent of all revenues.

Operating expenses of \$37 million were incurred with wages (excluding benefits) making up a third of the total. Equipment repairs and supplies accounted for 9 percent while equipment purchases (7 percent), dry and liquid fertilizers (8 percent) and herbicides (4 percent) were other big ticket items.

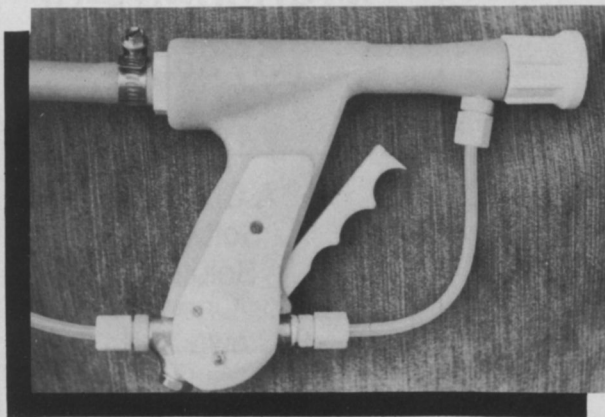
The average number of lawn maintenance accounts per company was 765, with an average account size of 8,001 square feet. Lawn care companies averaged 3.9 service vehicles per company. Lawn care customers received 5.5 visits from the average Virginia lawn maintenance firm. In the area of employee training, 65 percent provided in-house training, while 35 percent of all the state's lawn care

companies sent their employees to an outside, formal training service.

The most commonly reported lawn problems were: poor soil, 18 percent; improper maintenance by customer, 16 percent; broadleaf weeds, 15 percent; crabgrass, 11 percent; disease, 9 percent; shade, 9 percent; thatch, 6 percent; improper lawn species present, 5 percent; insects, 4 percent; and other, 7 percent. Of the species of turf serviced by lawn maintenance firms, 61 percent said their accounts were predominantly tall fescue and fescue mixtures; 33 percent service half tall fescue and half Kentucky bluegrass; and 6 percent service Kentucky bluegrass and mixtures.

The 1982 Virginia Turfgrass Survey was compiled and published by the Virginia Crop Reporting Service, Clarence Dunkerley, statistician in charge, Homer K. Rowley, assistant statistician in charge.

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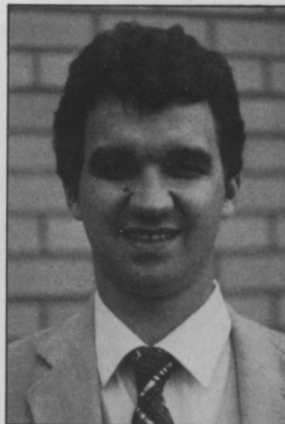
Michael H. Thiel has been named advertising manager of Mobay Chemical Corporation, Specialty Products Group Division. The advertising position was created as a result of the Specialty Products Group's rapid growth since the division was formed nearly three years ago. In addition to his advertising duties, Thiel will be responsible for the interactive videotex

activities of Mobay.

Thiel spent the past two years in a training program at Mobay's parent company, Bayer AG in Leverkusen, Germany. Prior to joining Bayer, Thiel earned a doctorate in marketing at the University of Bonn in West Germany, during which time he served as an assistant professor in the marketing department. He received his undergraduate degree in economics also at Bonn.

Dale Dawson has been named as a new regional manager for Hahn, Inc. in an announcement made by Sales Manager Kent S. Hahn. He will be representing Hahn's Agri/Turf Products in the southeastern United States. Before joining Hahn, Dawson was in the Marketing Division of AT&T.

Ron Tumiski is the LESCO salesman for the Boston, MA area, selling from a LESCO truck. A former golf course superintendent, Tumiski worked for the Baltimore City Department of Recreation and Parks as superintendent at Forest Park Golf Course for four years. He is a graduate of



Mike Oleykowski

the University of Rhode Island College of Resource Development with a major in natural resources.

Mike Oleykowski is the LESCO salesman for the Hudson Valley in New England, selling from a LESCO truck. A graduate of The Pennsylvania State University, Oleykowski has worked for more than 10 years in the turf field. In addition to his sales work in garden centers in New England, Oleykowski worked for three years as a lawn care applicator.

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ALA PLCAA UPDATE

Lawn care applicators across the country will benefit from the three new insect identification training sets available from PLCAA. The sets were produced on behalf of PLCAA by the Dow Chemical Company, and offer a



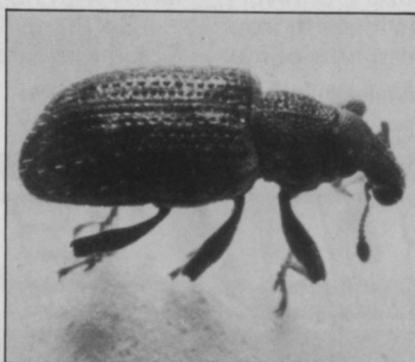
complete curriculum in insect identification.

The slide/tape programs use high-quality, original color photography and detailed narration to present specific lawn problems and insect control procedures. The programs are specific and easily understandable. All programs are non-product promotional, and introduce insect life cycles, feeding habits, inspection procedures and recommended control programs. The three programs are:

• **Destructive Turf Insect Pests** — warm and cool season grasses; warm and cool season pests;

miscellaneous nuisance pests; insect life cycles and feeding habits; recommended insecticides; the five steps of professional diagnosis and control; lawn zones; preparation, handling and application of insecticides; and using local entomologists for additional expertise (136 slides).

• **Destructive Turf Insect Pests in Southern Climates** — common warm season grasses (Bermudagrass, zoysiagrass, bahiagrass and others), surface inhabitants (sod webworm, fall armyworm, cutworm



Hyperodes weevil

and more), sucking insects (chinch bug, white grub, etc.), insect life cycles, types of lawn damage, five steps of professional diagnosis and control (inspection procedures, identification, life cycle study, insecticide selection, proper application) and how insecticides control various lawn pests (101 slides).

• **Destructive Turf Insect Pests in Northern Climates** — common cool season grasses (Kentucky bluegrass, ryegrass, fescues and others), surface pests (cutworms, sod webworms, hyperodes weevils, etc.), sucking pests (aphids, mites, leafhoppers and others), typical damage, feeding habits and life cycles, professional diagnosis and control, insecticide application and control properties and more (102 slides).

These sets are designed to allow instructors to add pertinent material throughout the program and personalize the training session. The slides are provided in boxes, accompanied by audio tapes. The sets cost \$30 each for PLCAA members, \$60 each for nonmembers. For more information, contact PLCAA at 404/977-5222.

MANY APPLICATORS NOW UNDER RCRA REGS



BY TIM WEIDNER

Come August 5, you stand a good chance of becoming a hazardous waste generator in the eyes of the Environmental Protection Agency. August 5 is the date the EPA has set for redefining its definition of the small quantity generator under new requirements of the Resource Conservation and Recovery Act (RCRA). Anyone who produces between 100 kilograms (220 pounds) and 1,000 kilograms (2,200 pounds) of hazardous waste per month will be required to label their waste with a hazardous waste manifest form to ensure that their waste is sent to an EPA- or state-approved facility. Previously,

only those who generated more than 1,000 kilos per month were required to manifest their transported hazardous waste.

The manifest form, which is designed by EPA and available from EPA, identifies the person who generates the waste and identifies the waste and quantity, according to John Skinner, director of EPA's Office of Solid Waste, Washington, DC. The manifest also includes a Department of Transportation description of the waste and the facility it will be sent to.

Unfortunately, these new regulations may only be the first and least stringent of coming RCRA rule changes. Lawn care operators can look forward to a second set of new RCRA regulations in March, 1986. "By next March we have to publish regulations which will set

standards for where those wastes can be shipped and perhaps additional record keeping and reporting requirements," says Skinner. A proposed version of those new shipping standards will probably be out in August, according to Skinner. "The law says those standards we set next March must require that hazardous wastes be only sent to registered treatment or disposal facilities," says Skinner.

EPA-registered hazardous waste facilities are called Subtitle C facilities. There are about 100 commercial Subtitle C facilities across the country, according to Skinner, so lawn care businessmen should not have trouble finding one to send their waste to, but there may be costly transportation expenses involved if a facility is not

(continued on page 22)

RCRA REGS

(continued from page 21)

nearby. Skinner is concerned that since many waste haulers and waste facilities will be notified for the first time in August that they are transporting and receiving hazardous waste that they may turn it away. Time will tell if public sentiment toward toxic chemicals will make it difficult to dispose of hazardous wastes.

Liquid waste ban. But even before the August 5 regulations take effect, this month the EPA has initiated a ban on liquids from hazardous waste landfills. A liquid hazardous waste, such as a drum of contaminated pesticide, can no longer be disposed of in a hazardous waste landfill. This ban also covers liquids that have been taken up by simple absorbents, such as crushed corn cob. Liquid wastes must be "de-watered" and solidified by some process like vacuum filtration.

However, everyone will be glad to hear that the EPA is considering an exc-

These new regulations may only be the first and least stringent of coming RCRA rule changes. More rules will be out in March, 1986.

lusion for liquids absorbed by cob, clay, etc. at spill sites, since it is common industry practice to clean up spilled material with absorbents. "We would like to interpret the statutes to mean that the absorbent rule does not apply to spills," says Skinner. "What we are primarily concerned about is if someone should have a drum of liquid waste and then just throw some absorbents into the drum (to create a solid waste)." He says the EPA now has a new paint filter test to determine whether a waste is a liquid or a solid.

A lawn care operator can easily avoid the ban on liquid hazardous waste by not creating the waste in the first place. If all rinsate from spray tanks and concentrate containers is reused on the job in the spray solution, there will be no liquid hazardous waste. Skinner says a commonly-held misconception states that any quantity of a hazardous material in a waste liquid automatically qualifies that liquid as a hazardous waste. The wash water resulting from spray rig cleanup, for example, would only be considered a hazardous waste if the EPA specifically listed it as such, but Skinner says the agency currently does not make such a distinction.

Although RCRA does not regulate wash water, this material may come under regulation by state and/or local

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statutes. If the wash water enters any waterway, that is a violation of the Clean Water Act. Wash water entering municipal sewer systems may or may not be prohibited, depending upon the pre-treatment standards imposed upon businesses by each local government. Check with local and state regulatory agencies to find out where you stand.

Skinner notes there is no limitation on the length of time a pesticide in concentrate form can be stored. However, the EPA does have something to say about storing a tank-mixed pesticide. Bill Muno, chief of RCRA Enforcement Section, EPA Region Five Office, Chicago, IL says after August 5 no one may store 100 kilograms or more of a pesticide in solution over 90 days. Once again, this storage restriction can be satisfied by simply using all pesticide solutions in the spray mix.

Record keeping. It has not been worked out yet, but when the second half of the new RCRA requirements come into effect next March, lawn care operators who fall under the 100 kilogram or more provision may find they have new record keeping duties. Facilities generating over 1,000 kilograms of hazardous waste per month already operate under RCRA record keeping rules. "Basically," says Muno, "it requires a biannual report of where the waste was sent and how much was generated, as well as a requirement to keep copies of each manifest for every load of waste that is sent out."

The rules that currently apply to the 1,000 and over kilogram generators may not apply to the 100 to 1,000 kilogram generators since EPA has the option to develop a lesser set of standards for this group, according to Muno. On the other hand, if EPA does



not propose new standards between now and next March, the current record keeping rules for 1,000 kilogram generators will then apply to 100-plus kilogram generators.

Enforcement. The enforcement of all RCRA regulations is generally a cooperative effort between EPA regional offices and state EPA offices, according to Muno. "A lot of the state agencies are authorized to carry out the RCRA program in lieu of the federal program," says Muno. For example, in Muno's Region Five territory, five of the region's six states are authorized to enforce RCRA. Michigan is the only state in Region Five whose EPA enforcement comes from the regional office in Chicago. "By and large, the state agencies are the first point of contact with people who are regulated under RCRA," says Muno.

By reducing the quantity of hazardous waste a business can generate

from 100 kilograms to 1,000 kilograms per month, the EPA has added an additional 175,000 new generators to the RCRA program, according to Skinner. The EPA currently regulates only 15,000 generators under the "old" RCRA regulations. The 175,000 new generators coming into the RCRA fold produce less than 1 percent of all the hazardous waste produced in the United States. The sheer numbers of new RCRA generators and their relatively insignificant contribution to national hazardous waste production will mean these "small fry" probably are not high on the EPA's RCRA enforcement list.

"Obviously," says Skinner, "we are not going to be able to go out and do a lot of inspections." To enforce the new RCRA, Skinner says his office will monitor damage incidents, waste spill incidents where the waste was not manifested and tips from people who see waste not being manifested or shipped to the wrong facilities. EPA will also begin training state agencies and many local agencies, such as fire departments and health departments, in RCRA enforcement procedures. "There will be occasional spot checks and where we get indication there might be violations, we will follow up in those instances with inspections and enforcement," says Skinner.

Spot checks will also be a function of the regional EPA offices. "As a component of our compliance enforcement program, we have a select percentage of generators and transporters that the states try to inspect each year," says Muno. "It is likely that a number of facilities, if they come into the system, will be getting a generator compliance inspection." In other words, there simply are not enough EPA inspectors to go around, so spot checks will be made on a random basis to generators who comply with RCRA and on a regu-

(continued on page 24)

FIFRA BILL REINTRODUCED

Senator Tom Harkin (D-Iowa) has reintroduced the 1983 Harper's Ferry FIFRA Bill in the United States Senate, S.309, and a companion bill will be introduced in the House, according to the National Arborist's Association newsletter. The new bill is said to contain all the provisions that its predecessor possessed.

Anti-pesticide activists are proclaiming the need to protect the authority of states and local jurisdictions to regulate pesticide use and to obtain better training and enforcement requirements. The House Ag Sub-Committee that will hear the bill has a new Chairman, Repre-

sentative Bedell (D-Iowa), who replaces Representative Brown of California.

EPA's Steven Schatzow, director of the Office of Pesticide Programs, continues to manifest concern over pesticide applicators. In a recent speech, he pointed out that "pesticide applicators often bear the greatest risks and, more than any other part of the population, have a direct stake in pesticide safety." EPA will be emphasizing applicator safety, including introduction of worker protection requirements. Schatzow has also indicated his opposition to raising the preemption issue, stating that the states can handle the matter of control by local jurisdictions.

lar basis to generators who have been known to break the rules occasionally.

EPA will be keeping the closest watch on those the agency considers the largest of the new generators. Twenty-two industrial categories were isolated by EPA as being generators under the new RCRA, but vehicle maintenance facilities, metal manufacturers and finishers, printers, photographers and dry cleaners are considered the heaviest of the over-100 kilogram crowd. EPA says the most common hazardous waste is lead-acid batteries, of which 90 percent are now recycled or reclaimed. The next largest waste category is spent solvents, which are recycled or reused over 70 percent of the time.

Those who find themselves in violation of RCRA regulations will find EPA fairly lenient in handing down penalties — at least to first time offenders. "For a person who just came under the program," says Muno, "it would be likely they would get a warning letter." If the errant company gives the warning prompt attention and complies with the specific items spelled out in the warning, Muno says a penalty will most likely be waived. "Penalties for generators deal more with the recalcitrant facilities that were given an opportunity to comply voluntarily," says Muno. "When they don't comply after one maybe two voluntary attempts, generally some penalty is imposed."

Penalties are also determined by the nature and circumstances of the violation. "We have an enforcement policy which tailors the fine to the type of violation, severity of the violation and degree of risk," says Skinner. "It can be adjusted for repeated noncompliance." In certain instances there is no fine at all, according to Skinner. "If the violation is of an administrative nature and it doesn't have any environmental implications, then there is no fine, just a notice of violation in some instances. If they correct it within a reasonable period of time, there is no follow-up." However, Skinner is quick to note that potential fines are very great — as high as \$50,000 per day of the violation.

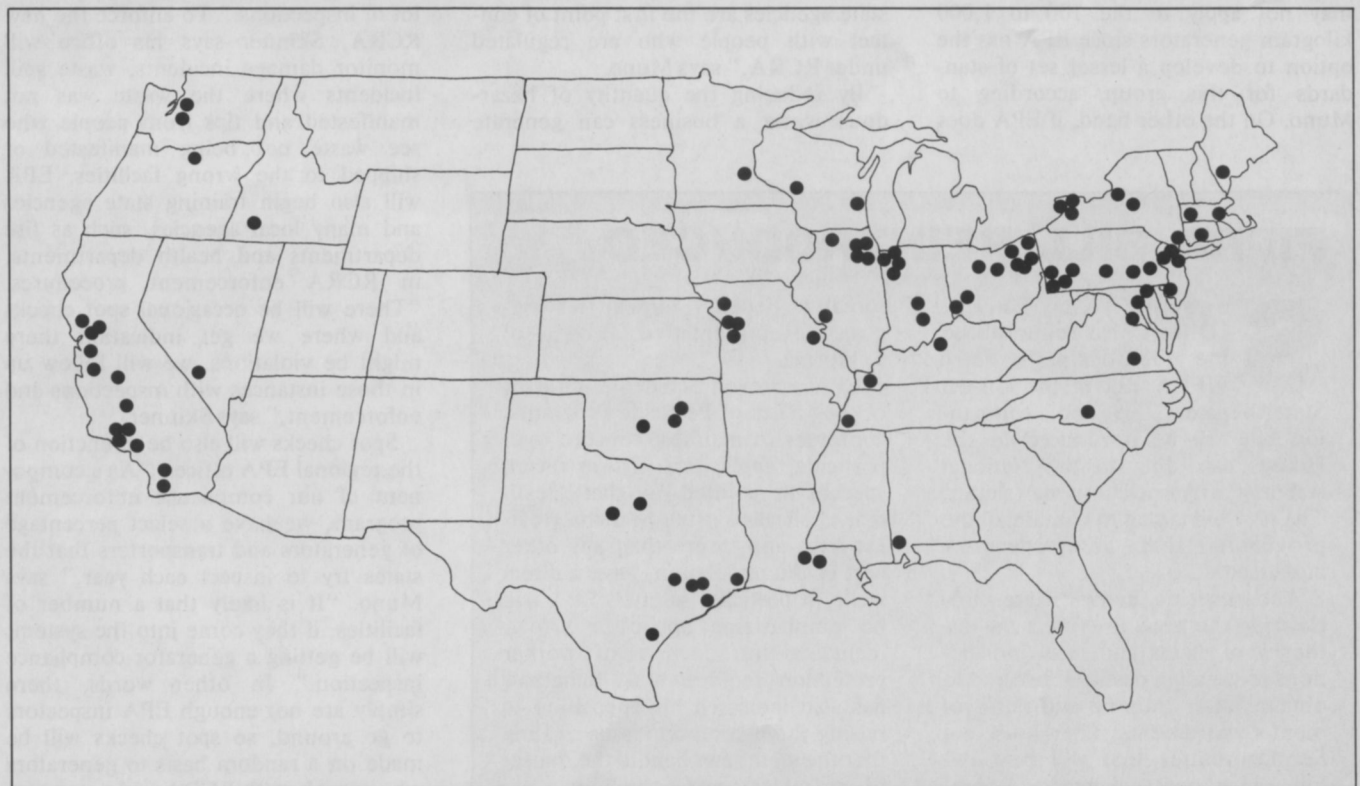
Generators should also know that it is their responsibility to test their wastes to determine whether or not they are hazardous, according to Skinner. A list of materials considered hazardous can be obtained from your state EPA office. In May of 1986, Skinner says EPA will probably require regulated businesses to obtain an EPA identification number as a means of associating a generator with the type and quantity of waste he generates. "Some may want to obtain EPA identification numbers come August because the haulers may not accept the manifest without the ID number on it," says Skinner. Obtaining an identification number is a simple registration process and no certification beyond that is required, according to Skinner.

EPA is preparing an ambitious publicity campaign for RCRA, in fact, the

agency has earmarked \$800,000 for this campaign. One of the major expenditures will be made on a series of industry-specific brochures explaining "what RCRA means to you." Skinner says he does not foresee any such brochures targeted specifically to the lawn care industry, but then he does not consider this industry to be one of the largest of the new generators. Lawn care operators may want to contact their state agency for a copy of the general information RCRA bulletins the EPA will also be publishing.

"I would be willing to have further discussions with members of the lawn care industry; if they feel further guidance is appropriate, we would be willing to work something up," says Skinner. If you would like the EPA to produce a brochure specific to this industry, you can contact John Skinner at the Environmental Protection Agency, Office of Solid Waste, 401 M Street SW, Washington, DC 20460.

RCRA opposition. As you might imagine, some industry people who will come under the provisions of the new RCRA program are not too happy about the situation. The National Agricultural Chemicals Association, headquartered in Washington, DC, has traditionally concentrated its lobbying efforts on the interests of its constituents, the agricultural market. But with the advent of the new RCRA program, the NACA now sees itself as an organ representing all pesticide users in favor of reasonable regulation of hazardous wastes.



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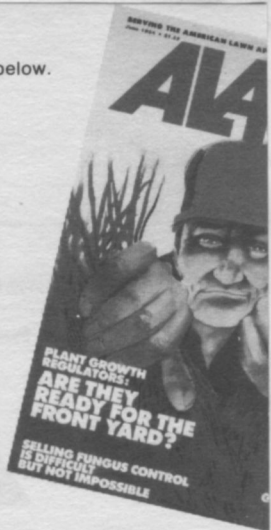
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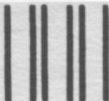
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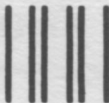
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"If something needs to be regulated, let's regulate it," says Thomas Gilding, director of NACA's Department of Environmental Affairs. Gilding believes detection of hazardous materials becomes ridiculous when reduced to a search for substances in the "parts per billion" range. "We would like to work with EPA to try to get things more realistic from a regulatory point of view," says Gilding.

Because the whole toxic chemical controversy has such a political posture right now, the NACA has had a difficult time approaching the hazardous waste issue directly. "As an association," says Gilding, "we are trying to put a lot of encouragement in this user group. We have government, industry and academia working together here to identify technology that is practical, reasonable and can be used even by a farmer." Gilding would like to see the EPA give their approval to such devices as biological pits where pesticides can degrade naturally.

The NACA would also prefer RCRA-related bodies of legislation to take greater precedence over the functions

If all rinsate from spray tanks and concentrate containers is reused on the job in the spray solution, there will be no liquid hazardous waste.

of the new RCRA. For instance, Gilding says the NACA is trying to get the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) squeeze RCRA off the books. "If that doesn't work, we will try to get RCRA to be more responsive to our types of waste," says Gilding. He would like EPA to hand down a set of guidelines for rendering a hazardous waste non-hazardous. "Let us know what we have to do and let us get on with it," says Gilding. He also supports uniform guidelines that apply to all 50 states.

Conclusions. The new RCRA regulations will no doubt encompass a good many members of the lawn care industry. Still, with a little attention to detail, you should be able to keep your production of hazardous waste below the proscribed 220 pounds (100 kilograms) per month. Remember, any form of pesticide that you can put back into your sprayer or spreader and use on the job cannot be considered hazardous waste. Sure, some types of hazardous waste are unavoidable, such as the paper bags most wettable powder and



EPA's logo

granular formulations are packaged in since they cannot be triple-rinsed like a liquid concentrate container. But it would take a virtual mountain of paper

bags to reach the 220-pound mark.

To find out whether or not your particular operation will be considered a hazardous waste generator under the new August 5 RCRA regulations, you should contact your state EPA office. Give them the specifics of your operation in regard to the types and amounts of materials you handle and they should be able to tell you where you stand. Or, when the EPA comes knocking on your door you can pretend you never heard of RCRA and hope the EPA officials we interviewed didn't lie to us about the leniency of their agency toward first-time offenders!

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CONTROLLING MOLES WITH FUMIGATION

BY JEFFREY D. BENJAMIN

Every year, lawn care and pest control operators face the unique challenge of mole control. These professionals receive calls concerning damage being done to lawns and other turf areas, but most control measures have been largely ineffective. At last, thanks to the EPA, the little diggers can be controlled and/or eliminated with Phostoxin® fumigant from Degesch America, Inc. But first, let's get to know the mole.

General description. Knowing the pest is half the battle in any pest problem. Moles are mammals, in the animal order Insectivora. They are not to be confused with rodents. Moles feed on insect larvae such as beetle grubs, but the main food source of a mole is the earthworm. Their feet, nose and tail are pink. The nose of

the mole serves as a touch organ. Their eyes are sometimes concealed by fur, and can only distinguish light and the absence of light.

The front feet are broad with long "finger nail-like" claws which allow them to dig very rapidly. This is the eastern mole. The star-nosed mole is semi-aquatic with projections at the end of its nose. The star-nosed mole is usually found in the northern regions close to water.

Biology. Moles produce one litter a year in the spring, averaging three to four young. The young will stay with the female about one month and then start their own tunneling. The young will develop very quickly and are about the same

Moles feed on insect larvae such as beetle grubs, but the main food source of a mole is the earthworm. Their feet, nose and tail are pink. Their eyes are sometimes concealed by fur.

size as the adult in four to eight weeks. Mole populations fluctuate slowly, increasing when the habitat becomes favorable, decreasing when food becomes scarce. Young females will not breed until the following year.

Feeding habits. Moles feed on insects, grubs, earthworms and assorted arthropods found during their tunneling. Their appetite is constant, and they usually eat more than their weight in food every day. Their extremely active life creates this very large need for food.

Although most of their feeding is on grubs or worms, some western species have been known to include plant material in their diet. However, it is generally felt that damage to plant life is from the tunneling and not from choosing vegetation as a food source.

Tunneling. Moles build an extensive complex of both deep and surface tunnels. The deep tunnels are not visible. The moles use these tunnels as a living quarters where they retreat from winter or from drought, heat or other adverse conditions. They also use the deep tunnels for rearing young. A mole hill is pushed up from these deep tunnels. Depending on the species, the deep tunnel may be from six to 24 inches below the surface.

Moles are very active tunnelers and can tunnel at a rate of 12 to 15 feet per hour. In favorable conditions, surface tunnels can be



Surface tunnels are only a fraction of the mole's tunnel system.



built at a rate of one foot per minute. Some deeper tunneling will even go on during the winter months below the frost line.

Feeding tunnels are usually shallow and the ground will be raised over these tunnels. These tunnels are usually used once and abandoned. The number of tunnels may not be indicative of the number of moles present. Moles can be active any time of the day and, depending on geographic location, can be active year-round.

Moles usually do not share with other moles, although some species will tolerate other moles of the same species. However, tunnels may be invaded by other small animals such as shrews, voles or meadow mice and sometimes rats, mice, gophers or snakes. Moles have been known to viciously attack these intruders.

Phostoxin treatments. 1. *Prior to application.* Inspect all visible burrows that can be treated. Inspect all mounds and burrows to determine the active burrows. Active burrows tend to run straighter than foraging burrows and show signs of freshly excavated soil. Foraging burrows tend to turn constantly, often turning back onto themselves. Abandoned burrows often end abruptly, show no signs of recent use and are collapsed along much of their length. If large portions of the system lie on properties that cannot be treated or are too close (15 feet) to occupied structures to be treated safely, the application may not be effective.

2. *Application.* Carefully make a hole in the top of the burrow without collapsing it. Place two phostoxin tablets every five to 10 feet in the active burrows. If the burrow is deep or goes under a tree or rock, more tablets may be needed. The drier soil may also need more tablets. Following a warm rain is a good time to treat, but never place fumigant tablets in standing water. After placing the phostoxin, put wadded paper in the hole with a little loose soil over it to make a seal.

Tablets should be lying in the burrow with neither the paper nor loose soil touching the tablet. Over-treating does not make the treat-



When making a treatment, it is important to locate active tunnels.

ment any more effective. *Never use phostoxin fumigant in a manner inconsistent with its labeling.* A supplemental label is available for this restricted use product. Always follow directions when using any pesticide.

3. *New activity.* Mole control is not always 100 percent effective on the first application. Give your first treatment three days to work. After three days, ask the homeowner to roll or stomp down the burrows so new activity may be noticed. When and if new activity is noticed, treat the new activity in the same manner. This time you will know exactly where the mole is working and have a better chance for control. On large areas, rolling of the mounds before the first treatment may be wise to save on fumigant.

4. *Problem areas.* Some areas that have a river, creek or wooded area may have a constant prob-

(continued on page 32)

lem with moles invading over and over again. These areas may need a monthly service. After the initial treatment, you might find an occasional invader from outside the treated area.

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estimate over the phone is possible.

Certification. Most states turf certification license is acceptable to purchase this restricted use fumigant. However, one should check with his state lead agency. For more information about how mole control can successfully enhance your business, contact Jeffrey D. Benjamin at 317/846-5444.

Jeffrey D. Benjamin is service manager at Fumigation Service and Supply, Inc., Indianapolis, IN.

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MOLE FUMIGATION: OTHER VIEWS

While the makers and distributors of Phostoxin® report excellent results with their product, some mixed reviews are coming in from the field. Some mole experts believe there are far more phostoxin failures than success stories. Bobby Corrigan, animal damage specialist at Purdue University, West Lafayette, IN, says fumigation with phostoxin for mole control is pretty much a hit or miss proposition.

"The mole tunnel system is so complex and extensive, depending on the age of the mole, that if you're lucky you might get those tablets in the right spot at the right time and get the mole," says Corrigan. He reports dismal results from his work with the product last year. "I spent the whole summer working with that product and I only had success once. That was when we could get tablets very deep into the burrow system where we suspected nests were located."

It may even be difficult to tell whether or not the moles were killed by the treatment or simply repelled. The activity may stop for awhile, according to Corrigan, but in a couple of days the mole could return.

Corrigan is also wondering if the makers of phostoxin can supply efficacy data upon request to support their claims about the product. "They have efficacy data from other countries, with other species of moles, with different formulations," says Corrigan. "As of yet, they have not been able to give any efficacy data done by research people here in the United States." Degesch America, Inc., manufacturers of phostoxin, will have to provide such efficacy data to



Eastern mole

the Indiana state chemist's office by the fall of this year to maintain their registration in that state, according to Corrigan.

When it comes to mole control, Corrigan falls back on an old standby — traps. "If you know what you are doing, you will have that mole in two or three days." Besides, says Corrigan, traps provide concrete evidence of mole control and are cost effective.

Despite Corrigan's reservations about phostoxin, the product does have supporters other than the people who make it and distribute it. Glenn Dudderar, extension specialist, Michigan State University, East Lansing, MI, claims he has been "very successful" with phostoxin. In fact, he has trained several pest control operators who are currently offering successful phostoxin mole control to their customers.

However, Dudderar has received at least three letters over the past year from people who have had poor results with the fumigant. But of the three, one person had used an insufficient quantity of the phostoxin tablets and another had used the product on an unknown mole species in Calgary, Canada, according to Dudderar. "I make no claims on moles other than the eastern mole and the star-nosed

mole," says Dudderar.

Though Dudderar has obtained good mole control with phostoxin, he cautions that it is not simply a matter of dropping a few tablets down a hole in the ground. The applicator must be cognizant of the product's limitations before making a treatment. For instance, Dudderar says it is futile to attempt control of male moles in the early spring because they construct lengthy burrows in an attempt to intercept females and it would be nearly impossible to place enough tablets in these vast burrows to reach the mole.

Applicators must also be prepared to treat the mole's entire tunnel system, which usually entails signing up several neighbors surrounding the initial customer because moles have little regard for property lines. It is also important to keep in mind that the surface tunnels you can see are only the tip of the iceberg. "That means a rather thorough treatment of surface tunnels to ensure that you are pushing some gas down into the deeper tunnels," says Dudderar. He also advises placement of tablets at all intersections of surface tunnels and wherever a "traveling" tunnel enters a maze of foraging tunnels.

"I end up using lots of tablets per burrow in experimental applications, a lot more than the label recommends," says Dudderar. "The label says four tablets per mole burrow. That is not nearly sufficient, at least not for the eastern mole, for the star-nosed it may be enough."

Applicators must also be willing to invest some time in a mole control job. Dudderar spends between one to

(continued on page 64)

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ALTERNATIVES TO TURF IN SHADE

BY ELTON M. SMITH

From a very practical standpoint, the best ground cover is fine turf, however, there are certain situations where turf should not or cannot be grown. Shade can create such a situation, particularly dense shade. There are several alternatives you may want to consider to provide utility, color and erosion control in the landscape.

The alternatives include ground covers, perennials and native wild flowers tolerant of shade. The best alternative in the most heavily shaded areas would be an attractive mulch. Shade from deciduous trees would offer the possibility of planting hardy spring flowering bulbs which bloom prior to full leaf emergence and add a significant degree of color to either a mulched area or a ground cover planting. The following plants are examples of ground covers for shady areas.

Deciduous. *Aegopodium podagraria variegatum* grows to eight inches and is commonly called goutweed. Goutweed is effectively used under trees or in other shaded and moist areas. This plant will grow in sun; however, the white portions of the attractive leaves may turn somewhat brown. Flat, white flower clusters appear in June. Goutweed spreads rapidly and may become a weed if not confined. The foliage dies with the first hard frost.

Galium odoratum attains a maximum height of six to eight inches and is known as sweet woodruff. A most useful ground cover in shaded, moist areas, particularly under trees and shrubs. Sweet woodruff is one of the few plants that flourishes under rhododendrons, which are shallow rooted. Its dainty texture, dense growth and even height lends itself to use as an underplanting near broadleaved evergreens.

Cerastostigma plumbaginoides grows to six to 12 inches tall and its common name is blue leadwort. Blue leadwort is used successfully on



slopes or as an underplanting for shrubs. Often used in large rock gardens, this ground cover makes a vigorous carpet of even height.

The glossy green foliage turns reddish bronze in autumn. Outstanding deep blue flowers of late summer last until frost. In a location where blue flowers are needed in late summer and fall, this plant is an excellent choice. One disadvantage to blue leadwort is that the foliage is late to emerge in spring, leaving a barren area. Blue leadwort will thrive in sun or shade in average soils.

Convallaria majalis will reach six inches in height and is commonly called lily-of-the-valley. Planted in full or partial shade, lily-of-the-valley produces a dense mat of foliage in summer and underground roots to hold the soil in winter. This plant is particularly useful under trees and shrubs where little else will grow or where fragrance is desired in the landscape. The white bell-shaped raceme flowers which occur in May are quite fragrant. Occasionally, red berries develop in autumn.

The major fault of lily-of-the-valley is that the foliage begins to fade to yellow and brown by





(left) Planting of *Liriope spicata* at a church. (below and facing page) Variegated hosta surrounded by mulch.



late summer or early fall. This ground cover should have yearly applications of fertilizer for best growth.

Epimedium species grow six to 10 inches tall and is called Epimedium or barrenwort. Epimedium is a perennial ground cover for use in

Generally unfamiliar to the gardening public, Epimedium has dense foliage of an even height with compound leaves.

shade, particularly under trees and shrubs. Generally unfamiliar to the gardening public, Epimedium has dense foliage of an even height with compound leaves remaining effective until early winter. In spring, the leaves are yellow-green tinged with red, turning green in summer

and crimson in autumn. Small spurred flowers in loose sprays or panicles appearing in April and May are red, yellow or white. Epimedium grows best in sandy loam soils well fortified with organic matter in partial to deep shade.

Liriope spicata reaches a height of eight to 18 inches and is commonly referred to as lily turf. Lily turf grows well under trees and shrubs and can be used on slopes, as an edging plant or wherever soil cover is required in the shade. The green grass-like foliage of lily turf makes an excellent dense mass until well into the winter when it begins to turn yellow. The blue or white flowers are borne on a spike slightly taller than the leaves. Flowers occur in July and August and are followed by blue-black berries in fall.

Adequate moisture and shade are the only essentials to success with this plant. A number of species and cultivars are known in the south, but are not readily available in the nursery trade. Similar to *Liriope* in appearance is *Ophiopogon*, commonly referred to as mondo. *Liriope* and, to a lesser extent, *Ophiopogon* may be used more in

(continued on page 38)

SHADE ALTERNATIVES

(continued from page 37)

the future due to their textured appearance and late summer flowering.

Xanthorhiza simplicissima grows to two feet tall and is known as yellowroot. This plant is well suited to moist soils, along stream banks. A rather tall-growing ground cover, yellowroot is little known to home gardeners.

The purplish flowers in pendulous sprays or racemes appear before the leaves emerge in early May. The leaves are compound in whorls at the tips of the stems and turn yellow and orange in fall. The stems are usually all the same length, giving a uniform height. The bark and root are yellow. Plant yellowroot in sun or shade, near a pond or stream, or where there is ample moisture.

Evergreen. *Ajuga* species reach four to 12

Pachysandra can be used in practically any shaded area where it is difficult to maintain grass. An excellent choice for the location of this plant would be under Norway maple or other trees where it is difficult to grow anything else.

inches in height and are commonly referred to as bugleweed. Bugleweed or carpet bugle is used as an underplanting for trees and shrubs, in narrow strips among rocks, on terraces and in numerous other ways. This plant grows rapidly in the shade with little care, provided ample moisture is available.

The rosettes of foliage lie flat and it spreads by runners from three to 10 inches in length. The flowers, usually blue, with pink and white flowering types available, occur on spikes three to nine inches tall in May and June.

Euonymus fortunei attains a height of two to 12

inches and is commonly known as wintercreeper. *Euonymus fortunei* and its cultivars are used in sun or shade to cover slopes due to their deep-rooting habit. Wintercreeper is vigorous and therefore used in medium to large areas, under trees, or as a connecting plant in the foundation planting, depending on cultivar. This species seldom bears flowers or fruits which are characteristic of the shrub and tree *Euonymus*. Some cultivars are valued for variegated foliage and others for good fall color.

Hedera helix reaches four to eight inches in height. Its common name is English ivy. English ivy is one of the choicest of ground covers, growing best in shady locations. With its long trailing stems, English ivy is ideal for northern exposures on banks, slopes or level ground where an evergreen is desired. This plant is lustrous dark green and has a permanent quality possessed by few creeping plants. These features, plus its rapid growth rate, makes it suited for use as an under-planting beneath trees and shrubs, a connecting plant in the foundation planting, a setting for flowering bulbs, or in other areas of the landscape where year-round color is needed. Avoid placing English ivy in a location exposed to continuous winter sun since the leaves will desiccate and turn brown.

Mahonia repens reaches a height of 10 inches and is called dwarf holly grape. This plant is a low-growing, semi-evergreen for use in shady areas. Similar in appearance to Oregon holly grape, except it is smaller and the leaves are dull.

Dwarf holly grape requires a well-drained soil in shade and must be planted away from winter sun because it browns severely some seasons. The yellow flower spikes in May are one to three inches long at the ends of the branches. The bluish green compound leaves are spiny on the margins, similar to Holly.

Pachistima canbyi grows to a foot tall and is commonly called canby pachistima. If a trim year-round appearance is desired in the foundation planting, use this plant. This evergreen spreads along the ground to about 18 inches. It should be used more than it is at present. The leaves are less than one-inch long, narrow and turn slightly bronze colored in autumn.

It will survive in full sun or shade, however, the soil should be well drained, slightly acid and have sufficient moisture. The plant tends to layer naturally or can be induced to do so by fastening the branches to the soil. Once established, little attention is necessary to successfully grow pachistima.

Pachistima terminalis grows to six inches in height and is called pachysandra. Pachysandra can be used in practically any shaded area where it is difficult to maintain grass, such as along walks, steps or the side of the house. An excellent choice for the location of this plant would be under Norway maple or other trees where it is difficult to grow anything else. Interplanted among narrow or broadleaved evergreens, it gives a pleasing and finished effect. Pachysandra is one of the most popular ground covers in use today.

Easy to grow and propagate, this evergreen makes a superbly rich green carpet in shade or partial sun. If planted in sites exposed to winter sun and wind, the leaves will turn yellow brown. Creamy white flower spikes appear above the



Jonquils in a mulched bed.

foliage in May. The soil for pachysandra should be well-drained with sufficient organic material incorporated. A yearly application of fertilizer is a good practice as is a pruning back of the tops before growth starts in the spring. Pruned plants are denser and of a more uniform height.

Vinca minor grows to six inches in height. The common name is myrtle or periwinkle. One of the best evergreen ground covers, myrtle is planted in large areas such as parks, cemeteries and around public buildings, in addition to areas in the home landscape. Myrtle is used under trees and shrubs and on banks in sun or shade. In shade, the leaves are glossier and richer. Myrtle will survive in sun if there is adequate organic matter in the soil and sufficient moisture.

The flowers are an attractive blue about one inch in diameter. They bloom in late April and flowering will continue for a long period of time. Plant in a well-prepared soil in shade or sun. Light shearing once a year promotes bushier plants and an annual application of fertilizer retains health and vigor.

Perennials. *Asarum europaeum* grows to six inches tall and is known as European wild ginger. For deep shade, the European wild ginger is an excellent choice used as an edging or in mass. The leathery, kidney-shaped foliage, which persists over winter, is a glossy deep green. The flowers which occur just above the soil line are usually hidden by the leaves. Ginger does best in moist soils with ample humus and shade. If in greater supply, this plant would be extensively utilized in shaded areas in the landscape.

Helleborus niger reaches a height of 15 inches and is called the Christmas rose. Flowering can occur anytime between November and April if the ground is free of snow and not frozen. Typically, flowering occurs in March or April. Plant where it will receive shade in summer and sun in winter in a site amended with organic matter. The off-season flowering and evergreen foliage are reasons enough to utilize this plant. The flowers are white with pink shading 1-1/2 to 2-1/2 inches across.

Hosta species will grow one to three feet tall and are known as plantain-lilies. Plantain-lilies are a fine ground cover under trees and shrubs

Myrtle is used under trees and shrubs and on banks in sun or shade. In shade, the leaves are glossier and richer. Myrtle will survive in sun if there is adequate organic matter in the soil and sufficient moisture. The flowers are an attractive blue color.

or as edging for perennial beds and shrub borders. For textured effects, for accent, or for striking contrast with smaller-leaved plants, these plants have value. The flowers are blue, lavender, purple or white and appear from July to September. The foliage is the most outstanding



A planting of *Helleborus niger*, commonly called Christmas rose.

characteristic. The foliage is lustrous dark green, blue or yellow-green, some green with white margins and others have variegated markings.

Plantain lilies grow best in semi-shade and in soils with ample organic content for water retention. Grown in deep shade, foliage will be luxuriant and flowers sparse, but in full sun, "burning" of leaves may occur, particularly on the variegated forms. Frost kills *Hosta* species to the ground; thus the area is bare and unattractive until growth starts late in the spring.

Hypericum calycinum's common name is Aaronsbeard St. Johnswort. This semi-evergreen reaches 12 to 18 inches in height and is used as a foreground for taller shrubs and to cover large areas of ground. Grown in sun or semi-shade in sandy soils, the underground stolons are produced abundantly and a cover can be established quickly. This plant is most outstanding in July and August when the bright yellow three-inch diameter flowers appear. Flowers will often last until frost.

Mertensia virginica grows to 12 to 14 inches in height and its common name is Virginia bluebells. Bluebells are most effectively used in the shaded rock garden or perennial border. They should not be massed because the foliage dies down by July, leaving a void. They should be in-

(continued on page 42)



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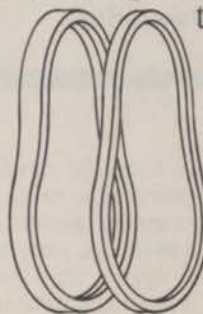
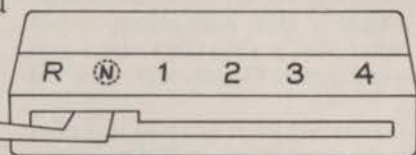
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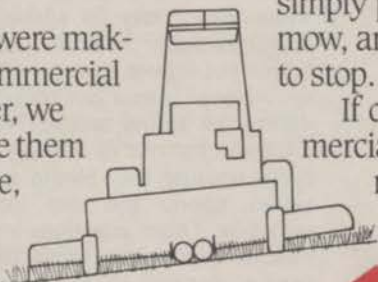
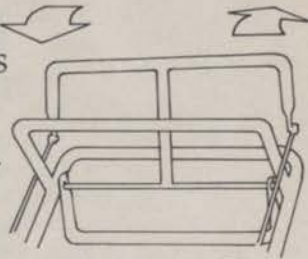
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SHADE ALTERNATIVES

(continued from page 39)

terplanted among plants with spreading summer foliage such as Hosta, so the holes in the planting will not be obvious. Mertensia grows best in shaded areas where the soil is cool and amply supplied with organic matter and water. The flowers borne in April and May in nodding clusters are a mixture of blue and purple about one inch in length.

Pulmonaria saccharata reaches a height of eight to 12 inches. This plant is commonly known as Bethlehem sage. The dark green leaves are conspicuously flecked with white spots. The reddish-violet or whitish flowers are borne in terminal, branched cymes on 12-inch stems. Use in mass to create a ground cover effect. Grow in full to partial shade in moist and cool soil of average fertility.

Wildflowers. *Viola odorata* grows six to eight inches tall. The common name is garden violet. Violets can be used for edging, for limited massing and as a wildflower in a naturalized site. In moist, fertile sites, the plants will spread rapidly and may become weedy. Moisture is important for maximum growth.

Bloodroot derives its name from the reddish-orange juice which Indians used as dye.

The fragrant flowers are 3/4-inch in width and are a violet color although pink and white cultivars are available. Flowering occurs in April and May.

Gaultheria procumbens attains a height of three inches and is commonly known as wintergreen. This plant is an excellent choice for woodlands or heavily-shaded areas. Any area in which moss survives will usually be satisfactory for this plant. Cultural requirements are an acid soil, ample moisture and shade.

The leaves of this evergreen are 1/2 to 1-1/2 inches long and shiny. The flowers bloom in May and are bell-shaped. The white and scarlet berries which develop in autumn and winter are attractive and edible. An extract, wintergreen, is made from this plant and used widely as a flavoring agent.

Mitchella repens grows only two inches high and its common name is partridge berry. Partridge berry is extremely attractive in woodland plantings in combination with mosses or near embedded rocks. The evergreen leaves are white-veined and the fragrant white, pinkish flowers are borne in pairs followed by attractive red berries 1/4-inch in diameter. The fruited plant is often seen indoors in terrariums in winter.

Partridge berry spreads into dense mats, since it roots along its stems. An acidic, organic soil, plus shade, are a must for success under cultivation. It is best moved in clumps of sod to remove as much soil as possible.

Lobelia cardinalis reaches three to four inches

in height and is commonly known as cardinal flower. Light to medium shade and slightly moist soil are the requirements for optimum growth of cardinal flower. Native lobelia is found along streams or in damp meadows. Mulching is desirable in summer and winter. The scarlet flowers, which are very attractive, extend from July to September.

Sanquinaria canadensis grows to a foot in height and is known as bloodroot. Bloodroot derives its name from the reddish-orange juice which Indians used as dye. The juice is found throughout the plant, but is most abundant in the rootstock. One of the first wildflowers to bloom in early spring with its showy creamy-white flowers. Usually found in deciduous woody areas, it requires shade, adequate drainage and organic soils.

Trillium grandiflorum reaches a height of 12 to 18 inches. The plant's common name is trillium. Trillium flowers in May when there is ample shade under the trees. Like most wildflowers that require shade, organic matter and good drainage are also required. All above-ground parts of trillium are assembled in threes: three leaves, three sepals, three petals (red, white, pink) six stamens and three ribs on each berry. The bloom period extends for two weeks.

Many other fine native wildflowers can be planted in shaded areas, such as spring beauty, jack-in-the-pulpit, lady's slippers, anemone, trailing arbutus and jacob's ladder, to name a few. Availability in the commercial nursery trade is limited with many selections, so watch the advertisements in gardening magazines.

Mulching. In certain landscape situations where shade is particularly dense and ground covers and perennials will not thrive and wild flowers would not be appropriate, the best solution may be to mulch the area. Needless-to-say, many selections of mulches are available, but the most effective and pleasing are the organic types.

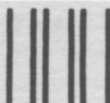
Examples of organic mulches would be hardwood, pine or cypress bark, peat moss, hulls, composts and utility wood chips among others. Shredded hardwood and pinebark chips or nuggets have proven the most popular selections in the Northeast in recent years.

To add color in spring to these areas, in some situations, it may be advisable to plant spring flowering bulbs. Typically, many of these bloom before the leaves emerge, cast dense shade and the bulbous plants can complete their life cycle during the spring season. Numerous bulbs are available, but one of the very best would be narcissus because they bloom early with large individual blooms and they increase in numbers each year. Other selections include tulips, with a wide array of bright colors. Unfortunately, tulips have a relatively short life cycle, like hyacinths, crocus, bulbous iris, scilla and anemone among others.

Ground covers, perennials and bulbs are readily available from wholesale nurseries and garden centers. Most any landscape with shade can be improved with the proper selection of shade-tolerant ground covers, perennials, wild flowers and bulbs.

Elton M. Smith is professor of Horticulture at Ohio State University, Columbus, OH.

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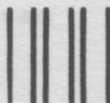
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BY TIM WEIDNER

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(continued on page 48)

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TURFSEED REPORT

(continued from page 46)

which will hit the market over the next two years. International's President Jim Carnes also predicts there will be new releases of turf-type tall fescues with finer leaves and darker green color. These new tall fescues will be more compatible with Kentucky bluegrasses and perennial ryegrasses. International is also working with Rutgers University on a new creeping bentgrass.

Carnes is excited about one of his company's latest perennial ryegrasses — 'Elka.' He says it is a low-growing, dense, fine-leaf turf-type perennial ryegrass. "It is the lowest growing and finest-leaved of all the perennial ryegrasses on the commercial market," boasts Carnes. "The supplies will be increased, but it will still be in limited stock." There should be adequate supplies of the company's other perennial ryegrasses — 'Derby,' 'Regal' and 'Gator' — provided there is a normal harvest a couple months from now, according to Carnes.

Although new varieties are coming on the market, Carnes says turf managers tend to stick with older varieties they have had success with. "They are reluctant to change to newer products," says Carnes. "They are getting a good job done with what they are using." At the same time, he says buyers are becoming more attracted to blends rather than specific varieties.

Many of the turfseed producers are responding to this demand with special blended product lines. "This is good for the consumer because he is getting genetic diversity," says Carnes. Be-

Turf managers can say goodbye to the steadily decreasing prices the market has enjoyed for the last three years. "This year I don't see any downward trend in price." — Jim Carnes

cause no single turf variety is perfect, in a combination of varieties, the strengths of one variety can compensate for the weaknesses of another. "The marketing of blends is really becoming a big factor in the marketplace," says Carnes. "Almost 50 percent of the varieties we produce are now going out in blends, or are being used in blends by other major companies."

Carnes also sees a trend toward increased utilization of the "shady" bluegrass *Poa trivialis*. He says his company never has enough of their



Dr. Gerry Pepin, director of research, Pickseed West, Tangent, OR, inspects a field of creeping red fescue. This photo, taken in August, shows a spring-planted field that is well established by late summer.

variety, called 'Sabre.' "We are usually sold out of it by October/November," says Carnes. "While most of it is used for overseeding in the South, there has been a good deal of interest in the transition zone, particularly in the Washington, DC area."

Many turf varieties will be in short supply again this year, according to Carnes. Turf-type tall fescue will fall short of the market's demands again this year. Because of some poor growing conditions in eastern Washington, the bluegrasses will also be short. Improved varieties of Kentucky bluegrass are still going to be in "restricted supply" for the 1985 crop year. "There is an indication that more is being planted," says Carnes, "but it will not come off until 1986."

While there has been a surplus carry-over of perennial ryegrasses over the past three to four years, Carnes predicts a more limited supply this year. "There should be enough to take care of the market," says Carnes, "but there will not be the inventory to supply the market going into the new year of August/September we have had in the past." He says the demand for quality turf-type perennial ryegrasses will continue to increase.

Turf managers can say goodbye to the steadily decreasing prices the market has enjoyed for the last three years. "This year I don't see any downward trend in price," says Carnes. "In fact, at this point the price has stabilized. There is a good chance that in the fall the price could increase."

Lofts Seed. Dr. Rich Hurley, product manager at Lofts Seed, Inc., Bound Brook, NJ, agrees with Carnes that turfseed prices have stabilized. Hurley says



This photo of 'Fiesta' perennial ryegrass was taken in November. There is excellent establishment after a September charcoal planting. (photo, Pickseed West)

we can expect the price of tall fescues and perennial ryegrasses to remain stable. "The bluegrasses will see a little bit of upward pressure on price," says Hurley.

Increasing bluegrass prices are reflective of the limited supplies currently experienced in most popular varieties until the new crop comes on, according to Hurley. The new crop will not come on until early September. "With bluegrasses, there are only a few varieties available, most of the popular varieties are sold out," says Hurley. There are, however, fair amounts of certain varieties like 'Baron,' 'Nassau' and 'Merit,' but Hurley says it will be difficult to locate all other varieties.

Perennial ryegrasses and fine fescues are in adequate supply, but Hurley says most varieties of turf-type tall fescues are in very short supply now. The tall fescues will remain short until the new crop is harvested in early September.

Normark. Joe Jacob, president, Normark, Inc., Tangent, OR, predicts turf-



'America' Kentucky bluegrass in June. Plants are "headed-out" and pollinating. This is a very nice, clean field which is crop- and weed-free. (photo, Pickseed West)

seed prices will increase moderately, if at all. "People will be content to let the market build on itself now that it has become established," says Jacob.

Jacob predicts the turf-type tall fescues and turf-type perennial ryegrasses will be in short supply because the demand was better than anticipated. "Fine-leaf fescue acreage was cut back because there was a little carryover previously," says Jacob. "Now that has been worked off, but it takes a year or two to get the acreage worked back up." Supplies will probably remain short through the spring of 1986, but Jacob expects supplies will be a little more free by the fall 1986 harvest.

"We expect supplies to be quite tight for fine-leaf tall fescue and fine-leaf perennial ryegrass through 1985 and the first half of 1986," says Jacob. "We anticipate a continuing shortage on the bluegrass. While we will have a little better crop than in 1984, we still will have no carryover."

Ryegrass Commission. Wally Hunter, executive secretary of the Oregon Ryegrass Commission, Salem, OR, says it is just a little too early to speculate on this year's turfgrass crop. However, the growers he has talked with have told him there is adequate moisture in non-irrigated fields because of the mild winter. Consulting with growers is one of Hunter's major duties since the Oregon Ryegrass Commission serves ryegrass growers by promoting their products generically to the public as well as supporting ryegrass research.

In an average year, 255,000,000 pounds of ryegrass will move into the marketplace, according to Hunter. The largest percentage of that amount comes from public variety production, of which most is common annual ryegrass and golf annual ryegrass. Proprietary varieties account for 35,000,000 to 40,000,000 pounds of the total 255,000,000 pounds.

"Ryegrass is the world's most widely-used grass and is also the biggest of the grass seed crops," says Hunter. He says ryegrass is so popular because it germinates quicker than any other turfgrass,

has a wide range of color and is compatible with bluegrasses and other turfgrasses.

J&L Adikes. Obviously, Hunter has a vested interest in the success of ryegrass varieties, but there is someone else with a similar interest who would also agree. "Of course I am a proponent of ryegrass, that all started right here on Long Island," says Bob Russell, president, J&L Adikes, Inc., Jamaica, NY. "I think you will see a tremendous increase in the usage of the improved turf-type perennial ryegrasses, particularly on the lawn applicators' part."

Because the demand for perennial

ryegrasses is increasing each year, Russell says a tightening in supply was apparent near the end of the last crop year for some of the proprietary varieties. However, he looks for good crops of both ryegrasses and bluegrasses this summer, at least for the proprietary varieties. Since the common varieties are grown on non-irrigated land, supplies of that seed are questionable.

While current bluegrass crops look good, the market is in the grips of the "most extreme shortage we have experienced in years," according to Russell. This spring, Russell says he could have

(continued on page 50)



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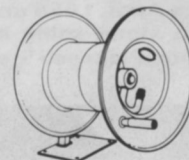
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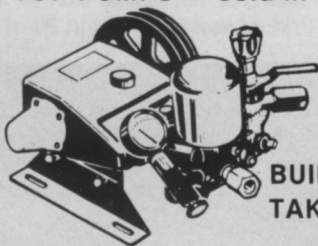
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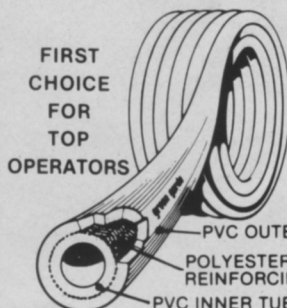
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TURFSEED REPORT

(continued from page 49)

sold 10 to 20 times as much 'Adelphi' Kentucky bluegrass if he had it on hand. "There is going to be almost a complete depletion of all the carryover of the proprietary bluegrass," says Russell. "If you look at the price sheets at this time, many of the varieties are indicating they are sold out already." Several factors have contributed to this shortage, but most important is last fall's bad crop caused by drought and ergot fungus attack.

The shortage of bluegrass will prevent any short-term stability in this seed. Russell predicts a "little tightening up" of perennial ryegrass prices. "There was a glut of ryegrass by July of last year, that was an anticipated carry-over and is being used up," says Russell. "Prices will be relatively stable with a possible increase later in the year for the proprietary perennial

ryegrasses."

The marketplace is currently buzzing about endophytes and what they can do for insect resistance in turfgrasses, but Russell is not convinced that endophytes will remain viable in storage. "If we claim it, we have to label it," says Russell. "If we are going to label it, we had better know how long it is going to stay stable. We don't know what causes it to lose its viability."

It sounds as though we should not expect any new varieties containing advertised endophytes from J&L Adikes until the storage problem is worked out, but we can expect a new shade tolerant variety from Adikes that Russell refers to as a "hot one." The new variety has no name as yet, but it will probably hit the market in two to three years. "This is probably the first grass that has been bred and developed for shade conditions," says Russell. The fledgling turfgrass is currently undergoing production trials.

Jacklin Seed. About a half-dozen new proprietary bluegrasses will hit the market in 1986 from Jacklin Seed, Inc. in Post Falls, ID, but because they are proprietaries, the company is leery about showing the competition their hand so early. Jacklin's vice president of Marketing, Harry Butler, can talk about some new varieties that will be coming out this fall.

Turf managers can look forward to four new proprietary bluegrass varieties from Jacklin — 'Classic,' 'Liberty,' 'Destiny' and 'Spirit' — to be released by various companies around the country. Butler is most excited about 'Arid,' a new turf-type tall fescue that he says ranks first or second in about 20 of the

25 categories in the Kentucky National Turfgrass Evaluation trials for turf-type tall fescues.

Butler says this season's turfgrass crop looks fine. "We survived a long, snowy winter this past year," says Butler. "In fact, eastern Washington and northern Idaho probably set a record with 123 consecutive days of measureable snow on the ground." The enduring snow cover helped the proprietary fields by acting like a blanket during the sub-zero temperatures the region experienced in December and January, according to Butler.

The proprietary Kentucky bluegrass fields look excellent. "I would imagine it appears to be a better than average crop for 1985," Butler cites excellent field burns last fall, followed by adequate irrigation, which produced good fall regrowth. Assuming a successful pollination in June, there should be a good bluegrass harvest in late summer.

If there is a shortage, it will be in the popular, mid-priced varieties in December, 1985 and January, 1986, according to Butler. "Mainly because there is no seed around today, so people will need it as early as possible to cover work they haven't been able to complete because of not having varieties available," says Butler.

At least the prices at Jacklin will not be up over last year's prices. "They will probably remain around the same levels with isolated decreases in some varietal prices," says Butler.

Northrup King. The experts at Northrup King Company in Minneapolis, MN, predict their prices will not change if the 1985 crop comes in the way they anticipate it will. "Prices are up slightly from where they were a year ago, strictly reflecting the limited supply," says Larry Vetter, sales manager of Northrup's Medalist Turf-products Division.

"Ryegrass prices are lower this year than they ever have been," says Vetter. "I don't see that changing." If the ryegrass prices do move, Vetter predicts they will only move up slightly. "As more tall fescues come on the market," says Vetter, "we are going to see more price pressure downward. Fine fescues are fairly stable in many respects, in that our production costs are so high on some of those that the price won't come down, although they are in ample supply."

To rank the market's demand for turfseed types, Vetter says ryegrasses are first, bluegrasses second, tall fescues third and fine fescues fourth in overall sales. Striking a balance between supply and demand in the turfseed market is no easy matter. The idea is to dovetail supply and demand so the company does not run out of any varieties, while avoiding tremendous quanti-

(continued on page 52)



Photo of 'Blazer' perennial ryegrass was taken in April, 1985 and shows an excellent stand going into mid-spring. (photo, Pickseed West)



Photo of 'Banff' Kentucky bluegrass taken June, 1984. (Pickseed West)

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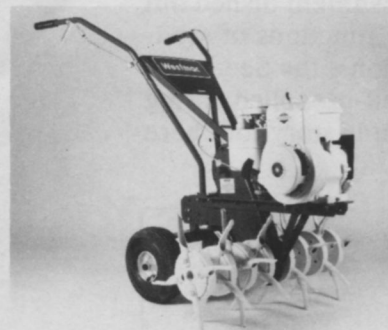
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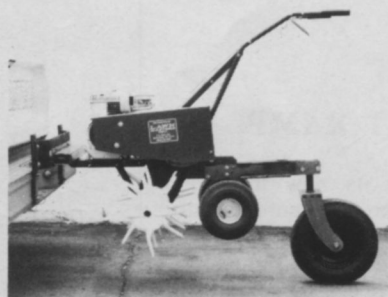
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TURFSEED REPORT

(continued from page 50)

ties of carryover inventory.

First, Vetter tries to determine what Northrup's sales emphasis might be at any given time in the future. Next, the company's experts try to guess the state of the nation's economy in the future. "Then you compound that with really not knowing what mother nature is going to do to you on the yield side," says Vetter. Given the nebulous nature of those factors, it is a wonder turfseed producers ever balance supply and demand!

E.F. Burlingham. At E.F. Burlingham and Sons in Forest Grove, OR, owner George Burlingham lets the largest consumers of his turfseed help him balance supply and demand. Burlingham tries to get pre-commitments from such large turfseed consumers as lawn care companies, wholesalers and golf courses. He then plans his seed yields based on orders from these consumers.

Burlingham says all of his proprietary varieties of bluegrass, ryegrass and fine-leaf tall fescue are sold out until after the harvest in July. That means Burlingham's 'Sydsport' and 'Hauga' bluegrass varieties will probably be available in early August. 'Pennant' and 'Belle' perennial ryegrasses and 'Falcon' tall fescue will also be available in August, according to Burlingham.

"We expect the supply of perennial ryegrasses will be very limited, not only of our varieties, but all the varieties, because production is down in Oregon," says Burlingham. "The availability of the fine-leaf tall fescues, both our varieties and others, will be somewhat limited in 1986 because so much of it is pre-sold." He says the proprietary bluegrass supply looks fairly good because many new fields are coming on strong.

Burlingham predicts price increases for some varieties, especially the perennial ryegrasses. "In September, October and November, those prices will go up maybe \$10 to \$15 a hundred," says Burlingham. "You already have high prices on bluegrasses and I think they will maintain." He does not anticipate any price increases for his own bluegrass varieties, 'Sydsport' and 'Hauga.'

At Burlingham, work is underway to develop grass varieties with and without endophyte. "We are developing varieties that are very high in endophyte for lawn purposes and we are developing varieties with no endophyte for forage purposes," says Burlingham. Endophytic fungi in grass plants are desirable in turf because they impart insect resistance, but in forage grass the endophyte causes weight loss and even death in livestock.

Turf Seed. All new varieties coming

out of Turf Seed, Inc. in Hubbard, OR contain a certain percentage of endophyte. "Some are higher than others," says General Manager Jay Glatt, "but that is certainly a consideration in our breeding program." Endophyte content was one factor considered in the development of Turf Seed's new "2 Series" proprietary perennial ryegrass varieties.

"We have selectively replaced all of our old varieties with what we call our 2 Series — 'Omega,' 'Citation,' 'Birdy' and 'Manhattan,'" says Glatt. All of the old fields were replanted with the new 2 Series last fall. "We reselected all our old varieties primarily for rust resistance," says Glatt. "At the same time we selected for better density and color." Stem rust is a major problem in turfseed production fields.

Glatt says the new turf-type tall fescues are in the biggest demand right now. Species have been selected from the old forage-type tall fescues for narrow leaves, better color and better density. "They are the most popular right now," says Glatt. "They are not the ones in greatest use, simply because the demand exceeds the supply."

Other than the turf-type tall fescues, Glatt foresees adequate supplies of all types of turf grasses. But even the turf-type tall fescues will be better off this year than they were last year. "They will be in greater supply than they were last year, just because there were more

"We expect the supply of all perennial ryegrasses will be very limited, not only of our varieties, because production is down in Oregon," says Burlingham. "The availability of the fine-leaf tall fescues, both our varieties and others, will be somewhat limited in 1986 because so much of it is pre-sold."

acres planted," says Glatt. He says there will be an ample supply of turf-type perennial ryegrasses this year and there will not be a surplus, as was the case last year. "Bluegrasses were terribly short last year, but at least at our company, they will be in adequate supply."

Price increases will pretty much follow the supply picture. "We anticipate a price increase in perennial ryegrasses over 1984, for the fall of 1985," says Glatt. "There was a surplus to the 1984 crop and the prices lowered to move the product. It is just coming back up to regular price."



Combining turf-type perennial ryegrass in late July. (photo, Pickseed West)

Pickseed West. Dr. Gerry Pepin, director of research at Pickseed West, Tangent, OR, agrees with Glatt about a price increase for perennial ryegrasses. But Pepin predicts turf-type tall fescue prices will remain about the same as last year.

Pepin says perennial ryegrasses and tall fescues are also in greatest demand today. "The perennial ryegrasses are so much easier to use than the bluegrasses," says Pepin. "They do almost as good a job, yet they come out much more quickly."

Pickseed West will introduce a new perennial ryegrass variety this year called 'Jazz.' This new variety contains high endophyte, is early maturing, is a good seed producer and has dark color. Pepin says endophyte content is not the most important objective at Pickseed, but "it is important to have it in there." Another new proprietary variety from Pickseed is 'Spartan' hard fescue, a drought-tolerant, low-maintenance variety. Also from Pickseed is 'Azay,' a sheep fescue that is a very drought-tolerant, cool-season grass, according to Pepin.

As many turfseed producers have said, Pepin sees a continuation of the bluegrass shortage for this year. "Next year will be better, but some of the good varieties will probably be short, but it should be better, much better," says Pepin. He says creeping bentgrass will be short and turf-type tall fescues will sell out again.

"A lot of the Kentucky 31 is being replaced by the new turf-type tall fescues," says Pepin. "We can't hardly produce enough of them to satisfy the market. They are better than the old Kentucky 31 for turf." He says customers actually ask for the tall fescues over Kentucky 31. "It was anticipated about five years ago when these things first came out that they would replace Kentucky 31 and it is actually happening," says Pepin.

Conclusions. Like every year, some types of turf grasses are in short supply and some prices will be going up. Most producers agree that the bluegrass shortage will continue and many also express doubts about supplies of perennial ryegrasses. A couple are worried about the tall fescue supply.

It is important to note, however, that if you examine the comments from each of the turfseed growers, you will find predictions of shortages and price increases that are not at all uniform. Unless specified otherwise, each grower is referring to his own particular turfseed crop. The weather in the Pacific Northwest affects all growers equally, but each grower has planned his yields a little differently, based on his personal market outlook. For example, a couple growers claim they can get their bluegrass production back on line sometime this year, while the rest predict an on-going shortage. You should now be able to fill your shopping list by identifying the haves from the have-nots for the particular varieties you need!



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TREATING ECTOPARASITES OUTDOORS

BY VIVIAN FOTOS

Most lawn care operators don't concern themselves with fleas, ticks, or mosquitoes. The main thrust of lawn care has been to keep turf viable and green, getting rid of fungus, chinch bugs, sod webworms and the like, and leaving ectoparasites for the pest control operator. But why? When fleas, ticks, and mosquitoes become a problem outdoors in grass, shrubs and trees, wouldn't it be advantageous for the lawn service professional to delve into this arena and enjoy some of the business like his indoor counterpart?

According to Dr. Stanley Green, associate professor of entomology at Penn State University, Philadelphia, PA, the situation as such "probably just evolved that way" since pest control has been around longer than lawn care. "The lawn care people are relatively new to the business," he says, adding that he believes turf and ornamental businessmen ultimately will get involved in treating ectoparasites outdoors, at least fleas and ticks. "There's no reason why they shouldn't be taking care of fleas if there are fleas (outdoors)."

In light of the recent trend toward diversification in the lawn care industry, many lawn care operators may want to weigh the pros and cons of expanding into flea, tick, and/or mosquito control. For Phillip VanDam, president of Fulton Company, Inc., North Miami Beach, FL, flea control has become a major part of his business, accounting for about \$150,000 in additional revenue each year.

"I don't know if everybody is capitalizing on it, but if they made the service available and were willing to use the products necessary, it's an avenue for profits," he says.

Fulton Company sprays for flea control with Dursban® and Vapona®, and gets "excellent" results. "We don't guarantee they (customers) won't get fleas," VanDam explains. "We just guarantee that if they have a recurring



problem, we will come back again and spray it at no additional charge."

Fleas are a major problem in the South, particularly in Florida. Yet, all lawn care operators do not view the abundance of fleas as a business opportunity. "You cannot eliminate fleas from the lawn in Florida," says Ed McKenzie, co-owner of Apex Pest Control and Lawn Care, Inc., Bradenton, FL. "However, you can hold down major infestations."

The only way a lawn care operator has any chance of completely eradicating fleas would be if pesticide applications could be made very frequently, he says. "Like once every two weeks or once a month — minimum. And most people are not willing to pay for that kind of a program."

That's part of the reason why Apex does not do applications for fleas and ticks *only*. "Flea and tick control is not sold separately. If customers are on a lawn contract, we're not adding any special product to kill fleas," McKenzie explains. "We're spraying it with an insecticide for the insects in the ground, which is naturally going to kill fleas, too. Occasionally we might make a respray or an inbetween spray if it's a real problem."

He, along with an industry colleague from Atlanta, William Moore, president of Green Lawn of Georgia, believes the most effective flea control is done from the inside. According to Moore, "The best flea control is to rid your house of them and keep your dog covered with flea powder."

"If you're going after fleas and ticks,

you really have to go through all the shrubbery and all around the perimeter (of the landscape and house), probably more so than on the lawn itself," he says. In addition, Moore is concerned about the longevity of effectiveness, "because all the pesticides we have will break down very quickly, especially in the summertime. To give control, you'd have to come back every week."

Callbacks are a problem, according to Nick Dennis, president of Pro-Lawn Plus, Jacksonville, FL. "A stray dog going across the lawn a week after you've been there can scratch off all kinds of fleas." Not to mention what can be brought in by other wandering critters, such as squirrels, armadillos, opossums, and raccoons.

Despite the need for repeat visits at times, Dennis says that flea and tick control can be profitable for the lawn care operator if he's careful. The first area of concern, he says, is the choice of products and the type of guarantee. Like most other lawn servicemen, Dennis will not guarantee flea control outdoors, primarily because of the difficulty in controlling the pupa stage.

"The pupa stage is the hard one to control," he says. "It will remain dormant for weeks, then boom! If someone steps on the case or goes near it, the pupa reacts to the vibration and the pressure, and it jumps out."

As far as products go, Dennis uses a mixture of Dursban® and Vaponite®, as well as Deltic®, for outdoor flea control. Indoors, he prefers Safrotin® and Precor®, but he also applies Ficam® or Ficam® Plus and Precor®.

Dennis, like many of his southern and western counterparts, is able to treat structural areas as well as turf and ornamentals since he is licensed in lawn care *and* household pest control. However, most lawn professionals are not, so indoor control becomes a critical issue. "Who's going to handle the inside?" Dennis asks. "If the lawn operator doesn't do something with the dog, doesn't do something with the inside, there's no sense in trying to step on the lawn to do something."

Coordination of outdoor flea and tick control with indoor treatments and

(continued on page 56)

TREATING ECTOPARASITES

(continued from page 55)

pet applications is vital to any success at all. Lawn operators who are not licensed to treat ectoparasites indoors will be limited to applying general-use pesticides inside the home.

This could be a reason why more pest control operators vie for outdoor ectoparasite work than lawn professionals. "We are in head to head competition for this market with the pest control companies," Dennis explains. "We have found that when people are looking for a specific flea spray, they will not call us. They'll call a pest control company. Down here," he says, "as soon as you stick 'lawn' in your name, they don't call you for stuff like fleas."

What's interesting, he says, is that pest control operators do not have to be licensed in lawn care to make a pesticide application for fleas or ticks on turf. "The logic is that they're doing pest control; they're not doing lawn and ornamental control," notes Dennis. "Don't ask me how you can see the difference there. If you're spraying a lawn, you're spraying a lawn."

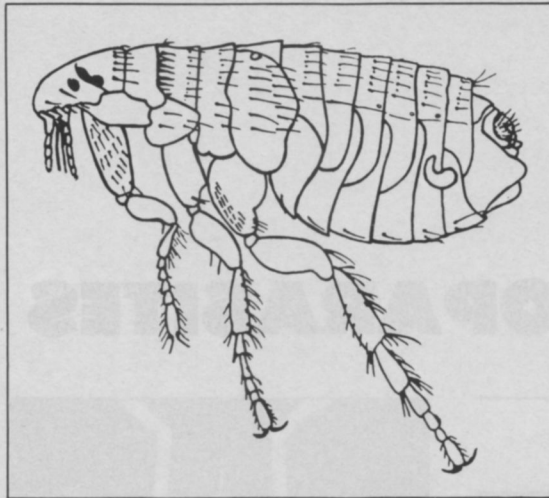
The added competition probably doesn't seem to be as disturbing to Dennis as the price low-balling. "We've found guys who will go out for \$30 on 5,000 or 6,000 square feet and spray the yard for fleas," he explains. "They think they're doing big bucks, but to me it's insulting."

When it comes to calculating ectoparasite work outdoors, lawn care operators price a job per square foot, just as they price their regular fertilizer applications. According to Gordon Crenshaw, director of Orkin Lawn Care, a typical flea or tick program costs approximately \$100 to \$125 for two treatments on a property of about 7,200 square feet. But it will vary depending on the lawn and infestation, he says.

"It's a good additional service just like deep root feeding, aeration, and some of the other things lawn operators do. But they have to charge accordingly," Crenshaw advises. "They just can't give it to customers and expect to make any profit."

Outdoor flea and tick control does not require a lot of sophisticated equipment, Crenshaw explains. In fact, most lawn care operators already are equipped with the necessary tanks. The drop tank is perfectly acceptable to use, says Crenshaw, cautioning that the lawn operator must make sure the tank is clean, flushed out, and free of any other chemicals. Other experts suggest separate tanks always be used for pesticides and herbicides, no matter how thoroughly cleaned, to avoid the risk of damaging non-target plants or animals.

The use of separate tanks will also avoid any disruptions in your regular



(Above) Adult cat flea. (Right, top and bottom respectively) Female and male American dog tick.



lawn service route. You won't have to dump out fertilizer from your tank and refill it with pesticide for servicing a flea job scheduled between regular service calls.

If a lawn care operator is serious about breaking into the ectoparasite field, he needs to start studying the biologies of fleas, ticks, mosquitoes, etc. Of course, identification is key, says Norm Ehmann, vice president of Van Waters and Rogers, San Mateo, CA. But beyond that the lawn care operator needs to be very familiar with each insect's and pest's life cycle so he can apply his chemicals properly.

"He needs to know where fleas lay their eggs, in what state the eggs are laid, and how the eggs get dispersed around," Ehmann explains. "He needs to know how all that differs from ticks. He has to know a tick is not an insect, and he has to be able to identify which tick he's working with, whether it's a brown dog tick or one of the many other ticks, because it makes a difference as to where he'll find the

"We are in head to head competition for this market with the pest control companies." — Nick Dennis, Pro-Lawn Plus, Jacksonville, FL

source (of infestation)."

"With mosquitoes," Ehmann says, "lawn care operators need to know what species of mosquito they're working with, because different species have different places to breed."

Very few opportunities are available in mosquito control for turf managers, because most municipalities employ government programs. However, that

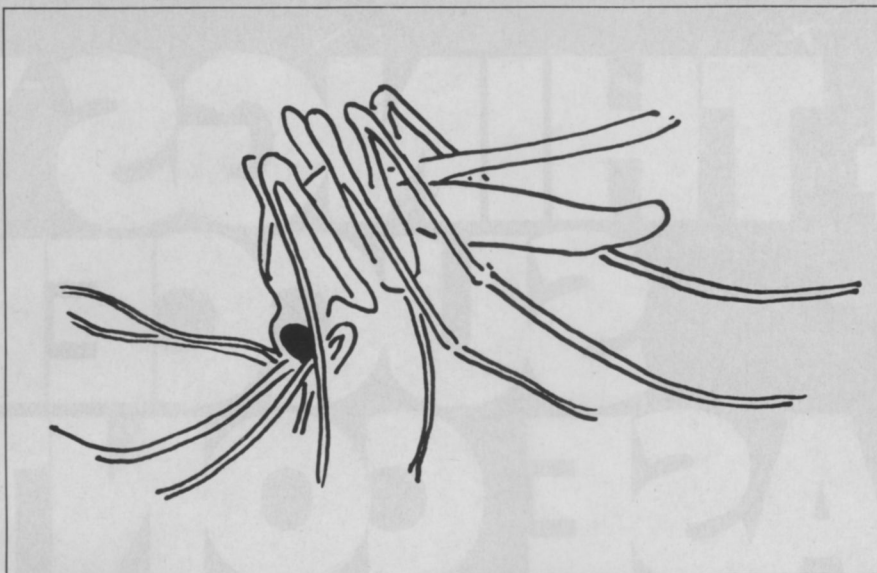
doesn't necessarily mean every city or county coordinates its own mosquito commission. Some do accept bids from local companies.

But treating mosquitoes is not an easy task. "One of the difficulties of mosquito control is that a private operator really doesn't have the right to get on all the properties he needs to get on to do the job," Ehmann explains. "A health department or a mosquito abatement district has the legal right for inspection through a neighborhood to get the sources eliminated. A private operator only has the right to do the job on the property that belongs to the people that hired him. And all mosquitoes have wings; they can fly from one property to another. Therein lies the difficulty of mosquito control," he adds.

But fortunately, the development of insect growth regulators and other biorational products have made it possible to eliminate mosquito larvae before they are able to emerge as adults and fly around. Materials such as Zoecon's Altosid®, a mosquito growth regulator which disrupts physiology at the larval stage, and *Bacillus thuringiensis* var. *israelensis* (Bti), a bacteria that paralyzes mosquito larvae upon ingestion and causes them to drown, are becoming more popular than adulticides since they are non-toxic to humans.

Of course, getting rid of standing water is the first step in mosquito control. But that's not always possible, says Sandra Kraft, vice president of Pinto & Associates, an urban pest management consulting firm. Prior to joining Pinto, Kraft successfully designed and implemented a mosquito control program for Fairfax County, VA. And a lot of her work involved larviciding with biorational compounds.

"I think the general consensus from people involved in mosquito control is



Mosquito

that ultra low volume (ULV) spraying (adulticiding) is the least effective alternative that you have," says Kraft. "I think the emphasis across the country now has been going more toward larviciding."

A definite advantage of larvicides, such as Altosid and Bti, is that they are long-lasting. "If you get them in briquette form, you throw the briquette in and it's supposed to last for up to 30 days before you have to repeat it," Kraft says. "If you have a body of standing water that's breeding mosquitoes and you're using standard pesticides in the water, usually you have to repeat it every week."

"It's expensive to adulticide and it's just not that effective," she adds. "If you can larvicide, you're so much better off. You get long-term control and you're getting rid of the adults before they ever emerge and disperse. Once they've dispersed," Kraft warns, "then it's real difficult to control them. Anything you do you're only going to have limited success, so it makes more sense to put all your eggs in the larviciding basket."

However, larvicides do have drawbacks, particularly the mosquito growth regulators. Since larvae will pupate before they die, Kraft explains, "The problem is you put the briquette in one week, you come back a week later, and you're still going to see all the mosquito larvae there because they're going to continue to develop. The product doesn't kill them right off and that makes a lot of people nervous."

"But I think once you get used to how the product works and you realize that even though you're still seeing all these larvae in the water, that they are not going to turn into adult mosquitoes, then I think people who have used it for awhile have found that they like it a

lot," Kraft says.

Another control method is to stock standing water with mosquito fish called gambusia. Gambusia are small, colorless, guppy-like fish that surface feed on mosquito larvae.

As mentioned earlier, most lawn care operators are not grabbing for a piece of the mosquito control market. However, one prominent company in the green industry did offer the service until last year. Their story is worth hearing.

In 1984, Davey Lawnscape of Kent, OH ended a mosquito program (ULV applications) it had offered for seven years. Part of the reason for its fold was due to the fact that corporate management decided to phase out the Environmental Services Division, which mosquito control fell under, says Ward Peterson. The other reason was because of difficulties in providing the service.

"It's a very short season and it's very intense," explains Peterson. "There

When it comes to calculating ectoparasite work outdoors, lawn care operators price a job per square foot, just as they price their regular fertilizer applications.

are a large number of variables for control, such as the weather. And it's a complaint-intense service from two ends. First of all, there's a concern over pesticides. And even though the modern methods and techniques are extremely safe, especially in comparison with anything else that is done on outside ornamentals, it's still very visible and it takes a lot of shots," he says.

"From the other end, the problems with control are immediately noticeable. If something happens and you miss a week, you know about it."

In addition to dealing with anti-pesticide sentiment and competing with government-controlled programs, Davey was limited to doing all the work at night. Aside from being the best time to get control, it was the only time when honey bees were not out — an insect to be concerned about since it is protected by law. "And anything that will effectively control mosquitoes," Peterson explains, "very effectively controls honey bees. You can get in some big trouble with that so you have to be careful."

But an even bigger problem for Davey was maintaining good management and supporting a staff over a year when the mosquito season only lasted three or four months. Personnel, trucks, and equipment had to be in use year-round, not just when the mosquitoes swarmed.

"I have some real questions whether mosquito control could support itself. I think you need some other services for off seasons," Peterson suggests. "If somebody had a multi-service organization, if they're plowing snow in the winter, selling firewood, and getting more time on their equipment, it would help a lot. As an adjunct," he says, "mosquito control is pretty good."

To make sure the service is profitable, lawn care operators must determine their prices accordingly, making sure they include costs incurred while not providing the service. "If they look at just their cost while they're doing the job in the middle of the season, they can offer it reasonably," Peterson says. "If they serviced a neighborhood, for instance, they may be able to offer mosquito control for \$15 to \$20 per year per homeowner."

"So the actual cost when doing it isn't much, but be sure that you realize that costs continue on throughout the year, so that will bring the cost up." A more reasonable figure, he suggests, might be \$30 to \$50 per homeowner.

Mosquito control might not be as viable of an add-on service as treating fleas and ticks, but it's certainly something to consider as more and more lawn service companies branch into related fields. As you probe the opportunities in treating ectoparasites outdoors, remember you'll have to do a lot of studying to learn new biologies and control techniques. A state exam will probably be required to become licensed in a new area of pest control, which is especially important when treating for fleas. And always remember to remain price proud. Your new profit center will quickly diminish if you're giving any service away.

4 THINGS YOU SUCCEED DISEASE CONTROL

1 THE RIGHT STRATEGY.

Every year, more lawncare companies discover new profits in turf disease control. If yours isn't one of them, we'd like to show you the way by sending you our free CHIPCO® 26019 fungicide *Healthy Business Package*.

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to establish a long-term customer relationship. In short, how it can improve your profitability by adding value to your existing customer base.

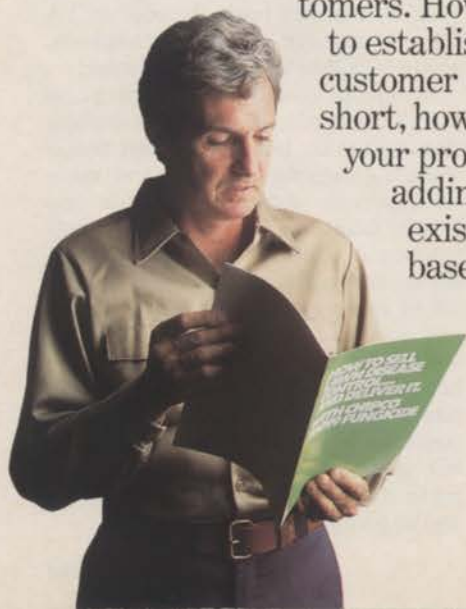
2 THE RIGHT TACTICS.

Coming up with an effective disease control sales strategy is one thing. Carrying it out is something else. Our *Healthy Business Package* shows you how.

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One reason lawn disease treatment is an excellent business opportunity is that many homeowners don't even know that turf diseases exist. If you make them aware of the problem—and offer the solution—in your advertising, promotions and sales calls, you'll capture more than your share of this growing market. We can help.



YOU NEED TO D IN THE ROL BUSINESS.

3 THE RIGHT TRAINING.

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We'll take care of that, too. In your *Healthy Business Package*, you'll find training aids you can use to teach your workers how to spot, identify and treat all the major turf diseases they're likely to encounter.

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Write 9 on reader service card

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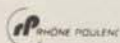
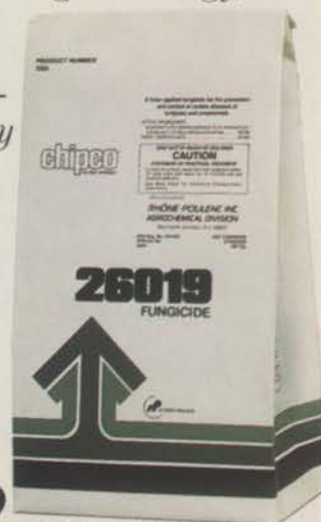
It controls the major turf diseases, including Leaf Spot, Red Thread Dollar Spot, Fusarium Blight and Brown Patch. So it's the only fungicide you need.

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As a foliar spray, you can begin your application when the disease first appears and repeat at 10- to 14-day intervals throughout the growing season. Shorten application interval during humid, rainy weather.

Apply one-half pound per 100 gallons of water (one tablespoonful per two gallons). For powdery mildew and botrytis gray mold, use one pound per 100 gallons of water. And for anthracnose for shade trees and woody ornamentals, begin at bud break and make two or three additional applications at 10- to 14-day intervals. Consult label on use of spreader-sticker.

Benlate can also be applied by drench or preplant dip treatment for control of botrytis, fusarium, rhizoctonia and sclerotinia stem, crown and root rots on herbaceous annuals, perennials and bedding plants; Cylindrocladium and Thielaviopsis rots on woody ornamentals such as azaleas, rhododendrons, conifers and poinsettias.

Write 116 on reader card

A new grasscatching system is now available from **Grasshopper**. The Quik-D-Tatch unit will increase the overall versatility of Grasshopper mowers, according to the company. Three fast and simple steps will remove or re-attach the Vac unit. This lets the

operator conveniently go from areas that require a grasscatcher to areas that do not. Quik-D-Tatch will be standard equipment and available for the 44-inch, 52-inch and 61-inch Grasshopper mower widths.

Write 117 on reader card

Betasan® from **Stauffer Chemical Company** can be safely used to prevent infestations of crabgrass and other weeds on established turf without harming desirable grasses. On turf containing older varieties of bentgrass, for instance, this selective herbicide offers excellent control where other herbicides might cause burning, according to the company. Betasan is the only herbicide labeled for the control of crabgrass and other weeds in bentgrass. It is labeled for use on the following turfgrass species: perennial bluegrass spp., fescue spp., bentgrass spp., bermudagrass spp., perennial ryegrass, *Poa trivialis*, St. Augustinegrass, bahia grass, centipedegrass, zoysiagrass and redtop.

Write 132 on reader card

W.A. Cleary Chemical Corporation offers Weedone® DPC herbicide for controlling annual and perennial broadleaf weeds in lawns and other ornamental turf areas. The product should be applied any time broadleaf weeds are growing actively. Dandelion, plantain, ground ivy and clovers respond best to treatment in fall or spring before flower heads develop. To control wild garlic, spray it in early spring and late fall for two consecutive treatments. Winter weeds such as chickweed and henbit should be treated in very early spring.

Summer weeds such as knotweed and spotted spurge are most easily controlled while they are small. In areas with extended growing seasons, treatment in both spring and fall may be needed to control more resistant species.

W.A. Cleary also has several other turf specialty products, such as All



Wet, a non-ionic wetting agent for use with pesticides and for use as a turf penetrant. Spotrete 75 percent WP is a contact fungicide (Thiram) for the control of dollar spot, brown patch and snow mold. Cleary's Dursban® 2E contains two pounds per gallon of Dursban for broad spectrum control of chinch bugs, sod web worms, ants, earwigs, etc.

Write 127 on reader card



Exmark Manufacturing Company introduces a 21-inch, walk-behind lawn mower with an adjustable cutting height of 1/2-inch to 3-1/2-inches. It is powered by a four hp Briggs and Stratton engine. Both the front and rear wheels feature greaseable roller bearings and both are easily replaced. The handle configuration includes a reinforced lower handle mounting system, and the large capacity, poly-material bag



can be removed easily by the operator. The 21-inch Exmark commercial mower is designed to offer close trimming edges for professionals, as well as an optional rear-bagging grass catcher.

Write 138 on reader card

Reveille gypsum from **American Pelletizing Corporation** supplies approximately 15 to 17 percent sulfur in the sulfate form — which means immediate availability; it also provides 22 percent calcium. Elemental sulfur requires extended time periods for complicated chemical reactions and also requires the interaction of soil bacteria, proper temperatures, soil moisture and aeration for conversion to the sulfate form.

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Western type alkali soils have high sodium levels which prevent turf production. Calcium will replace the sodium in the soil and soluble sodium compounds are formed which can be leached below root levels. Thus alkali soils can be returned to productivity.

Clay type "gumbo" soils often contain high magnesium levels and little organic matter. The soil particles seem to be glued together and air and water cannot penetrate. Calcium sulfate additions bring about an ion exchange which results in dramatically improved soil friability and tilth; thus greatly improving water and air penetration and permitting root growth where it was previously impossible.

American Pelletizing Corporation also offers pelletized limestone, gypsum and dolomitic limestone.

Write 126 on reader card

Estech, Incorporated's Professional Products Division has created a totally unique IBDU® slow-release nitrogen source. Although it is slow acting, IBDU is 100 percent available to the turf in a single growing season. Unlike ureaformaldehyde sources, IBDU is not substantially affected by variations in temperature or bacterial activity and depends almost entirely upon hydrolysis (water) for its release to the soil. IBDU is the

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PROFESSIONAL PRODUCTS

registered trademark of isobutylidene diurea, Estech's exclusive controlled release nitrogen source. It is manufactured by combining

isobutylidene and urea to yield the most effective source of water-insoluble-nitrogen available.

Write 129 on reader card

Dacthal WDG, a water-dispersible granule, is being manufactured and marketed by **UAP Special Products, Inc.**, Omaha, NE. Dacthal WDG is easy to mix, dust-free and provides the same excellent weed control applicators have come to expect from Dacthal.

Write 144 on reader card

Unitrac Equipment Company offers a unique combination of treatment features never before available in a single lawn care machine. The machine's features include four hoppers for dispensing granular material, a 20-gallon spray tank and hydraulically-operated aerator. The operator is assisted by power-articulated steering and hydrostatic drive for ease of operation. This piece of equipment is still



experimental and is being offered to those who wish to purchase all manufacturing rights.

Write 147 on reader card

J. Mollema and Son, Inc. of Grand Rapids, MI is pleased to introduce Valley Green brand custom-blended liquid fertilizer with Nitro-26 CRN. Nitro-26 CRN liquid controlled-release nitrogen fertilizer is a unique source of nitrogen, consisting of methylene diureas (UF Polymer), and a small percentage of free urea. Nitro-26 CRN provides a uniform growth and color pattern response. This is economical to use because of reduced leaching and volatilization and since the amount of free urea is very low, the salt index is extremely low. Nitro-26 CRN has the lowest salt content of all liquid methylene ureas on the market today!

Valley Green brand liquid blends are true solutions. Urea and Nitro-26 provide nitrogen, and Poly-N provides both nitrogen and phosphorus. Muriate is the primary potash source, and some blends carry a combination of muriate and another very low salt potash. J. Mollema and Son, Inc. has been a distributor of quality products for over 70 years. Mollema's also distributes

products as Liqui-Land liquid lawn food, Par Ex (IBDU) granular fertilizer, Shaws fertilizer, Vertagreen and herbicides from PBI Gordon and Elanco.

Write 146 on reader card

Nor-Am Chemical Company has an insecticide for lawn care operators who are interested in lawn ectoparasite control, namely ticks and fleas. Deltic® is a special formulation of Delnav®, an insecticide/acaricide for outdoor residual control of fleas, ticks, chiggers and mites. It is especially designed for control of these pests in parks and recreational areas. Deltic controls ticks, chiggers, fleas, ants, leafhoppers,

NOR-AM
NOR-AM CHEMICAL COMPANY

crickets, harvestmen, sod webworms and clover mites in lawns. The product is an emulsifiable liquid containing 2.4 pounds of active ingredient (dioxathion) per gallon. It is available in one gallon containers.

Nor-Am also has a 38-0-0 slow release sprayable nitroform nitrogen called Powder Blue®. This is the fine powder form of Nitroform® ureaform. Produced by combining urea and formaldehyde under controlled manufacturing conditions, its slow-release characteristics are predictable and dependable. Released by soil microorganisms, the nitrogen is available during plant growth cycles when organisms are also most active.

Write 114 on reader card

Powered by a heavy-duty, 3-cylinder, water-cooled, 4-cycle Mitsubishi diesel, the **Ransomes Diesel** is a quiet, trouble-free rotary rider. It features a 74-inch steel cutting deck, 10-gallon capacity, twin-saddle fuel tank, stamped disc wheels, 7-inch drum-type wheel brakes and Nelson muffler. Many options are available with the diesel, including steering brakes, roll bar, Peco Vacuum, winterized cab and various snow plow/blower accessories.

Two of Ransomes' other rotary riders, models T-18B and T-24N, are driven by power transmitted from the tractor PTO by drive shaft to a right angle spiral bevel gear box on the mower deck, via the belt system, and then to spindles which move the cutting blades. Stamped disc wheels are controlled by individual 7-inch, drum-type wheel brakes with hydrostats for maximum stopping power. The 7-gallon, high-impact, polyethylene fuel tank is located safely at the rear of the tractor.

Write 115 on reader card

TWO-LINED SPITTLEBUGS ON SOUTHERN TURF

BY PATRICIA P. COBB

Two-lined spittlebugs are sucking insects that belong to the insect family *Cercopidae*. Adult and nymphs have long been recognized as occasional pests on ornamental plantings. However, in the last few years in the deep south, two-lined spittlebug nymphs have become grass pests on home lawns.

Grass damage and hosts. Spittlebugs damage grass by piercing the plant tissue with their needle-like mouthparts and sucking out plant sap. Spittlebug nymphs are the stage which damages grass. The nymphs surround themselves with a mass of froth ("spittle") close to the soil. Grass that is damaged first looks wilted, then turns yellow, then browns and dies. These damaged areas may start out as wilted or yellowed patches two to four inches in diameter. Yellowed areas resemble grass affected by iron chlorosis. In heavily-infested turf, these small areas may blend so that the whole lawn appears off-color.

Plants commonly infested by adult spittlebugs are hollies (especially Japanese holly) wild grasses, aster, blackberry, pea and morning glory. Spittlebug nymphs have been reported as damaging a variety of ornamental plants, coastal bermudagrass and weedy grasses. Lawn grasses damaged by nymphs include, St. Augustinegrass,



zoysiagrass and bermudagrasses. Centipedegrass is also damaged, however, damage seems to be more severe than experienced in other grasses. Damage to lawn grasses usually begins to be seen in June and continues through August or early September.

Description and life cycle. Two-lined spittlebugs overwinter as eggs in hollow stems, behind leaf sheaths and in plant debris on the soil. Eggs require high humidity to develop and hatch. Nymphs hatch in May and early June in most of the South.

Newly-hatched nymphs move around and begin feeding in humid, sheltered places, usually deep in the turf. Soon each feeding nymph produces a frothy mass of "spittle" which protects it from drying and natural enemies. Each time the nymph molts, it may crawl to another feeding site and must develop a new spittle mass. These



(left) Spittlebug spittle mass in turf (right) Spittlebug nymph inside spittle mass



(left) Two-lined spittlebugs damage large patches of lawn which begin to turn yellow, then brown. (below) Two-lined spittlebug adult



wingless nymphs resemble adults in shape, but are a little smaller, and are off-white, orange or yellow with red eyes. After feeding for about a month and going through four nymphal periods, two-lined spittlebugs become adults.

Adults are most active in early morning and spend the warmer hours of the day deeper in turf or foliage. They live about a month and females deposit eggs during the last two weeks of this time. There are two generations a year, and there is usually some overlap between these generations. Eggs laid in mid-summer hatch about two weeks later; those laid in late summer or early fall go through the winter in this stage.

Spittlebug damage and humidity. The major factor for development of two-lined spittlebug populations on turf is humidity. Eggs and nymphs require a moist, humid environment for growth and development. The deposition of eggs deep in the turf and the development of the mass of spittle by the nymphs are both mechanisms through which high humidity can be conserved.

Humid weather conditions in the Southeastern United States during most of the period between May and September, as well as regular turf watering procedures also provide needed moisture. Under these humid, moist conditions, thick turf and thatch are a perfect combination for retaining this necessary moisture at a level deep within the turf where damaging spittlebug nymphs are located.

Diagnosis and control. An abundance of adult spittlebugs on ornamentals and lawns may result in the infestation of turf areas that meet the thatch and moisture requirements necessary for egg and nymph development. However, control of adults has not yet been shown to be effective. Lawns that are heavily infested with spittle-

bug nymphs may feel "squishy" when walked on, as if shaving foam were underneath. This sometimes occurs before yellow spots appear in the grass.

Examine these areas or wilted spots for nymphs. Remember, spittle masses are usually located deep within the grass or in the thatch. Open spittle masses to reveal the nymph, feeding head down. Be sure proper diagnosis is made before spittlebug control efforts are made.

Control of thatch is an important part of preventing and controlling spittlebug populations on lawns. Proper dethatching and fertilization practices can disrupt the humid conditions so essential for spittlebugs. When treatment is required, mowing prior to application may also aid in control. Clippings should be collected and destroyed. If possible, irrigate turf after mowing, several hours before insecticide application is made. Once treatment is done, mowing and watering should be delayed for several days.

Although no turf insecticide is specifically labeled for two-lined spittlebug control, lawn care professionals in the South have controlled infestations effectively with diazinon 25 % EC, eight fluid ounces per 1,000 square feet; and chlorpyrifos (in less thatchy turf) 22.4 % EC, 1.5 fluid ounces per 1,000 square feet. (Never apply pesticide for treatment of plants or sites not listed on the label.) Sprays should be applied in six to 10 gallons of water per 1,000 square feet, depending on the thickness of the turf. Reinfestation from surrounding lawns or other areas may occur. However, proper turf management may make annual retreatment unnecessary.

Dr. Patricia P. Cobb is an extension entomologist with the Alabama Cooperative Extension Service, Auburn University, Auburn, AL.

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CONTROLLING MOLES

(continued from page 32)

two hours treating an entire mole system. "In the common suburban neighborhood where you have lots bounded by streets on all sides and you treat the entire mole system, I find it to be very effective." But if the mole's system runs into an unmowed meadow or a wood lot it will be impossible to trace, and thus untreatable. Following successful treatments, Dudderar says dead moles will often be found above ground after they have attempted to escape the phostoxin gas.

He says star-nosed moles are easy to kill with phostoxin. "Anyone who is licensed to use it, but is not using it on star-nosed moles is missing the boat," says Dudderar. While making a treatment, Dudderar walks the mole's system and plugs any surface holes with newspaper to prevent escape of gas. He points to two reasons why many people may be getting poor results with phostoxin: they are treating single yards rather than whole mole systems and they are using too little material even though they are following the label instructions.

Dudderar sums up the phostoxin situation: "I am pleased with the results as I use it, but it certainly is not without controversy." — *Tim Weidner*

ADVERTISER'S INDEX

Biochem Products	22,27
Bulkem Corporation	19
Ciba-Geigy Corporation	7
Cushman/Ryan Turf Equip	66,67
Dow Chemical	34,35
Fortunate Enterprises	8
Fumigation Service & Supply	12
Graham Lawn Care	18
Green Garde	49
Hawkeye Chemical	15
Imler Industries, Inc.	16
Intl. Lawn Equipment Expo	54
Lawn Masters	52
LESCO	68
Liqui-Land	12
Mobay Chemical Corp.	2,3,4
Monsanto Company	10,11
Nice 'N Green Plant Foods	53
Nor-Am Chemical Co.	33
Parker Sweeper Company	45
Perma-Green Supreme	18
PLCAA	9
Practical Solutions	17
Professional Turf Equip.	18
Olathe Manufacturing	64
RGB Labs, Inc.	47
Rhone-Poulenc	58,59
Salsco, Inc.	51
Smithco	13
Terracore Products Co.	8
Toro	40,41
UAP	17
Union Carbide Ag. Prods. Co.	28,29

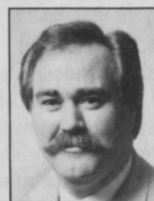
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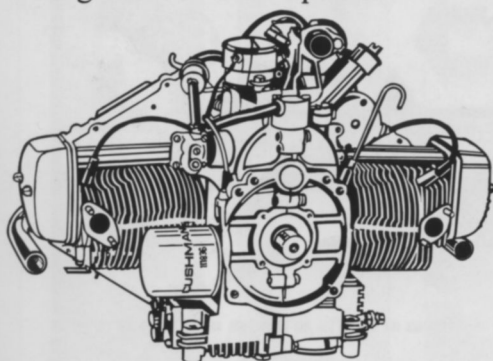
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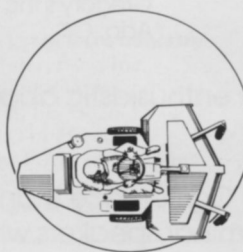
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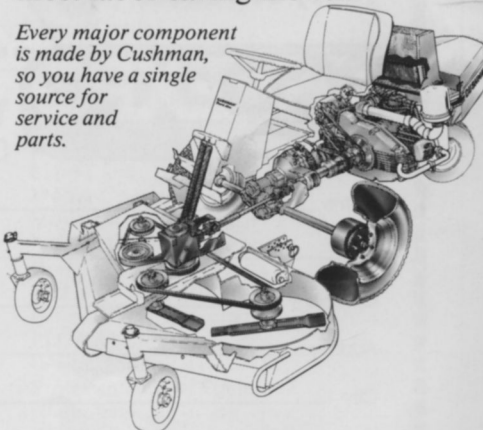
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