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AERATORS: A REPORT FROM THE FIELD



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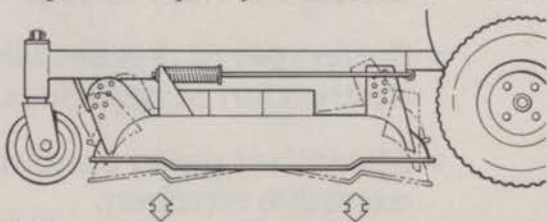
riding mowers and two *new* Commercial mid-size walk mowers. The

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COVER

Our cover photograph features examples of virtually every type of aerating tine: slicing tines from Feldmann Engineering and Manufacturing Company and Cushman/Ryan; closed and open coring tines from Cushman/Ryan, Perfco Corporation, Hahn, Inc., and LESCO, Inc.; and spoon tines from LESCO, Inc. and Hahn, Inc.
Photographer: Barney Taxel

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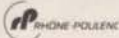
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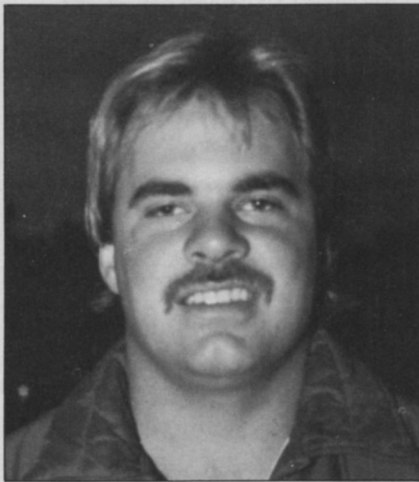
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VIEWS ACROSS THE LAWN CARE INDUSTRY

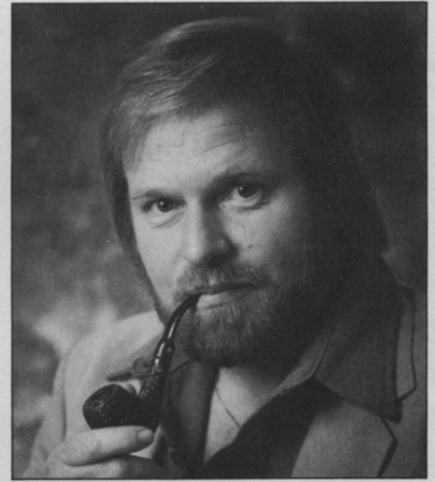
DO YOU THINK TURF CHEMICALS DO AN ADEQUATE JOB?



"You have to apply them correctly at the proper time. We've never had any problems, and we use both granular and spray on lawns. I understand that some people have had trouble getting a uniform application, but that's never been a difficulty with us. If you keep your equipment maintained and your applicators trained, the chemicals will do the job for you." — **Tom Zuecher, Three Z Inc., Valley View, Ohio**



"The chemicals do a good job if they are used properly by the applicator and then the proper precautions are followed up by the homeowner. We tested about 25 yards with LESCO's new pre-emergent, and 23 of them looked great. We know we put out the product just the same, but what did those two homeowners do differently?" — **Ron Zwiebel, Green Care Lawn Service, Birmingham, Alabama**



"The Canadian lawn applicator most definitely does have a more difficult time than his United States counterpart. A typical example is the chemical Oftanol® that is so badly needed for surface feeders and grubs in the Niagara, Canada area. But it is unavailable in Canada due to its lack of a Canadian PCP number." — **Gary Vanderheide, Bobby Lawn, Inc., Sarnia, Ontario, Canada**

CALENDAR

Dec. 2-5

New Jersey Turfgrass Expo '85, Resorts International Hotel, Atlantic City, New Jersey. Contact: Dr. Henry W. Indyk, Soils and Crops Department, Cook College — Rutgers University, New Brunswick, New Jersey 08903; 201/932-9453.

Dec. 2-5

1985 Ohio Turfgrass Conference and Show, Cincinnati Convention-Exposition Center, Cincinnati, Ohio. Contact: John Street, Ohio State University, Cooperative Extension Service, Agronomy Extension, 2021 Coffey Road, Columbus, Ohio 43210-1086; 614/422-2601.

Dec. 3

Western Turf Care Industry Conference and Trade Show for 1985, Adams County Fairgrounds, Henderson, Colorado. Contact: Tom McBride, Colorado State University Extension Service, 9755 Henderson Road, Brighton, Colorado 80601; 303/659-4150.

Dec. 9-12

1985 Convention and International Sympo-

sium, National Fertilizer Solutions Assn., Las Vegas, Nevada. Contact: Dennis Brown, National Fertilizer Solutions Association, 8823 North Industrial Road, Peoria, Illinois 61615; 309/691-2870.

Dec. 10-12

North Central Turfgrass Exposition, Peoria, Illinois. Contact: Thomas W. Fermanian, University of Illinois at Urbana-Champaign, College of Agriculture, 106 Horticulture Field Lab, 1707 S. Orchard Street, Urbana, Illinois 61801; 217/333-7847.

Dec. 19-20

Southern Nevada Conference on Desert Landscape Management: Turfgrass, Sahara Hotel, Las Vegas, Nevada. Contact: Robert Morris, Cooperative Extension Service, 953 East Sahara Avenue, S.T. & P. Building #207, Las Vegas, Nevada 89104; 702/731-3130.

Jan. 5-7

16th Annual Georgia Turfgrass Conference, Georgia Center for Continuing Education, University of Georgia, Athens, Georgia.

Contact: Dr. Gilbert Landry, Jr., Extension Agronomist - Turf, Extension Agronomy Department, University of Georgia, Athens, Georgia 30605; 404/542-5350.

Jan. 7-8

20th Annual Conference of the Tennessee Turfgrass Association, Music City Rodeway Inn, Nashville, Tennessee. Contact: Lloyd Callahan, University of Tennessee, Department of Ornamental Horticulture, P.O. Box 1071, Knoxville, Tennessee 37901-1071; 615/974-7324.

Jan. 22-24

Mid-Atlantic Nurserymen's Trade Show (MANTS), Baltimore Convention Center, Baltimore, Maryland. Contact: Mid-Atlantic Nurserymen's Trade Show, Inc., Perry Hall, Maryland 21128; 301/256-6474.

Jan. 28-29

1986 Horticulture Industries Show, Tulsa Convention Center, Tulsa, Oklahoma. Contact: Turf Extension Specialist, Oklahoma State University, Department of Horticulture and Landscape Architecture, 360 Ag Hall, Stillwater, Oklahoma 74078. ■

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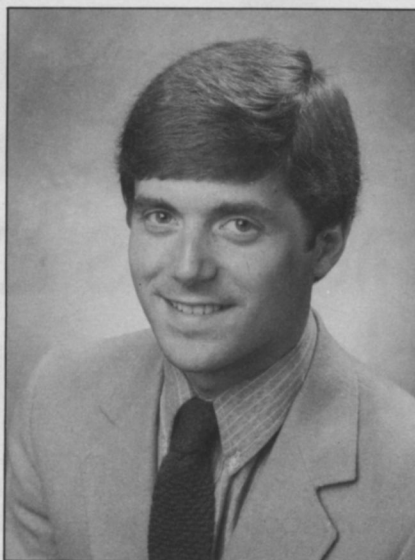
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INSIDE STORY

Aerating is probably the fastest growing lawn care add-on service. More lawn care businessmen have already incorporated, or have considered incorporating, this service into their service repertoire than any other auxilliary service. To discover the attraction for aerating, we first surveyed 500 of our readers to gauge their expectations of a "good" aerator, and then contacted those survey respondents who wrote their names and phone numbers on the survey forms. Their opinions about aerating appears in this month's cover story, "Aerators: A Report From The Field."

In conjunction with the cover story, we have a report on the results of the aforementioned survey compiled by Amy Sheldon, our Circulation Manager. As you will see from her report, in some respects lawn care operators know what they are looking for in an aerator, but in other respects their expectations are unrealistic. Turn to this article and compare your ideas about



aerators with your peers.

The centerpiece of this issue is three articles designed to give you a "sneak peek" at 1986 lawn care products. First, we have a preview of mowing

equipment for next year. Second, you will find a preview of 1986 spray rigs and spray rig components. Third, is an article outlining new formulations from the chemical companies that supply this industry. We hope you will find this "inside information" interesting and useful.

Also in this issue is a story about a very ambitious "persson," Gelorma "Chomie" Persson. Going beyond the confines of her role as co-owner of the Little Silver Repair Center, Inc., Mrs. Persson has probably done more to promote the interests of this industry than any other single person. We can only hope that her leadership will inspire others to follow her example.

And, as always, we have an interesting assortment of technical features. Read on!

Tim Weidner

Like horror stories? Here's a scary one. You're the victim.

Once upon a time, a powerful, well-financed coalition of special interest groups set out to severely limit the manufacture and use of pesticides. They used every means at their disposal, including fear and misinformation. They were wrong, and there was opposition, but the opposition was weak and disorganized and easily overcome. The result was an unmitigated disaster for our nation's health and economy. And if pesticides or herbicides were a part of your business, you were out of business.

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How do you fight back? Organize. Fight fear with the truth. That's the purpose of the Pesticide Policy Foundation (3PF). 3PF recognizes the value of pesticides to our health and well-being, and the need for a sane and reasoned pesticide public policy.

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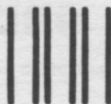
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EPA; CFR 40..263.20 (a)... A transporter may not accept hazardous waste from a generator unless it is accompanied by a manifest, signed by the generator in accordance with the provisions of 40 CFR.

CFR 40..265.315... Any empty container must be crushed flat, shredded or similarly reduced in volume before it can be buried in a land fill.

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NEWS IN BRIEF

MICHIGAN AND OHIO SPONSOR FIELD DAYS

September was a busy month for both the Michigan and Ohio turfgrass associations and state universities. In coordination with Michigan State University's Agricultural Experiment Station, Departments of Crop and Soil Sciences and Botany and Plant Pathology, and Cooperative Extension Service, the Michigan Turfgrass Foundation was first that month to hold a one-day program of educational seminars, research plot tours, and trade exhibits for industry professionals.

The subjects discussed at Michigan's Field Day (September 5) ranged from Management Programs for Greens and Modeling Summer Patch to Perennial Ryegrass Use in Michigan and Pre-emergent Herbicides and Cultivation. Dr. Joseph M. Vargas Jr. of the Department of Botany and Plant Pathology, Bruce Branham of the Department of Crop and Soil Sciences, and Dr. Paul E. Rieke of the Department of Crop and Soil Sciences presented their Irrigation-Disease Management Study, which is being conducted to determine the effects of irrigation on disease development and cultural practices. The three irrigation regimes consist of a daily irrigation treatment where .10-inch is applied daily; an 80 percent pan treatment where 80 percent of the water that evaporates from a pan is replaced; and there's no supplemental irrigation treatment where the only moisture supplied is from natural rain fall. Each treatment is replicated three times. Within each block, one half has been seeded to a Kentucky bluegrass blend and the other half has been sodded to the same blend to see if difference exists between



Attendees heard a wide variety of speakers at Michigan State's Field Day

seeded and sodded turfs to the various treatments.

Three years ago a similar study showed better quality turf in the daily irrigated plots than in the other irrigation treatments. A reduction in the amount of *Helminthosporium* melting out was noted, but there was an increase in the amount of dollar spot. In

addition to looking at these two diseases again, Summer Patch and Necrotic Ring Spot will also be studied.

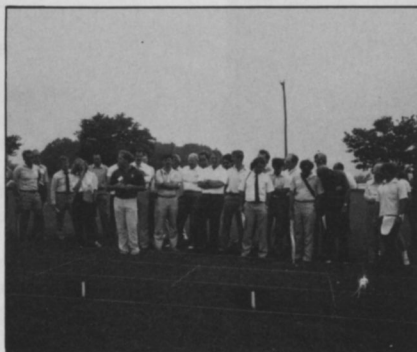
James A. Murphy presented a Core Cultivation Update. Considerable interest has arisen regarding the use of solid tine coring units on putting greens, he says. Supporters of this practice feel a shattering of soil occurs with this method, and because no soil cores have to be removed, reduced labor and less interference with play are advantages over the standard practice. Opponents are concerned about the potential for causing greater compaction, particularly at the bottom of the coring hole.

Murphy initiated research to evaluate the effectiveness of both hollow and solid tine coring on putting green soil when cored at two moisture levels with two compaction levels in May 1984. The study was performed on Penneagle creeping bentgrass maintained under golf green conditions and grown on a loamy sand soil. Conclusions of the research indicate that both hollow and solid tine coring appears to have a loosening effect on the soil surface, although data suggests the soil properties below the surface are being adversely affected. Some compaction is occurring at the deeper end of the cultivation zone, according to Murphy, and the severity of this compactive effect may be enhanced when coring during wet soil moisture conditions, particularly with solid tines.

Murphy does not think solid tines will replace hollow tine coring as a standard practice. He and his colleagues see it as a supplemental operation, with further research and field use proving the long-term value and/or detriment.

The Ohio Turfgrass Field Day's

(continued on page 18)



(Above) Attendees view turfgrass research plots. (Below) Brady Surrenta demonstrates the Spray Check by Accu Tech.





First things first, Ed. Sulfur-coated urea isn't new. Why should anyone consider Scotts? "We don't make ours with the old TVA process. That requires a coating of sulfur, followed by a waxy sealant, followed by a coating of conditioner. Other companies make that."

How is your SCU different? "We have a better way to apply the sulfur coating which eliminates the need for sealants and conditioners."

But what does that mean in terms of results? "The simplicity of our SCU means predictable performance, time after time, shipment after shipment. Because we don't use a waxy sealant, for example, there's one less variable to affect the release of the nitrogen."

How will it work on a customer's lawn? "Warm weather or cold weather, the nitrogen from our SCU will be released steadily, evenly, and safely over a predictable period of time. It will keep the lawn green, and the lawn will be ready for another treatment at the time you've scheduled that next treatment."

Are there any other differences between Scotts SCU and other SCU products? "Yes. Our SCU is made to specifications that meet the requirements of lawn service companies. It's different from the SCU that goes on farm fields or to nurseries."

Can I get Scotts SCU in bulk? "Bags or bulk, whichever way you want it. We can also supply it with or without phosphorus and potassium."

How does the price of Scotts SCU measure up against competitive products? "You'll find that the cost of this SCU compares very favorably with what you're used to paying. Because we have a unique computer-controlled manufacturing process that uses fewer raw materials, we're able to give you a more reliable product at competitive prices."

For more information on sulfur-coated urea, call Scotts Lawn Care Service Supply Division at 800-543-0006. In Ohio, call collect 513-644-2900.

"Scotts® SCU will deliver consistent and predictable performance on your customers' lawns."

Ed Scheiderer, Scotts quality engineering manager (SCU Products), talks about Scotts sulfur-coated urea.

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Now Low Odor.

We were helping LCOs stay ahead of the pack before there was a pack.

Back when you could count lawn care operators on one hand, Dow perfected a highly effective insecticide for use in turf. Research showed that this insecticide, called chlorpyrifos, gave immediate control over a broad spectrum of surface feeding insects. And it kept on controlling them for weeks.

That was the start of DURSBAN® insecticides. They were developed and registered for turf applications before any other use. And as the lawn care profession grew, the reputation of DURSBAN spread. LCOs across the country, looking for cost-effective insect control, have found the answer in DURSBAN.

They know that it stays where it's applied, because it bonds tightly to organic material in soil as soon as it dries. So it won't cause damage to non-target species. Won't wash away with rain or watering. And retains its control power for 6 to 8 weeks. They like its broad spectrum label for turf, ornamental and shade tree insects.

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DURSBAN effectiveness has been thoroughly researched and confirmed in decades of testing at leading universities. And DURSBAN is the *only* turf insecticide on which human toxicity testing has been conducted. So lawn care applicators can apply it with complete confidence, and customers need not worry about the safety of their pets and children after the treated surface has dried.

Dow's partnership with lawn care professionals and golf course managers goes far beyond supplying advanced products. We also conduct many types of market and product research, and share the results for your benefit. We produce helpful training materials for applicators, operators and others. In cooperation with the PLCAA, we have prepared materials to answer frequently asked consumer questions concerning the effect of chemicals on the environment.

DURSBAN insecticides. Developed for lawn care operators—preferred by lawn care operators. Available as emulsifiable concentrates or wettable powders. If you're not using DURSBAN, you could get left behind. Talk to your distributor today.



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NEWS

(continued from page 14)

educational line-up was equally as impressive as Michigan's. Topics ranged from Thatch Management and Natural Shade Performance to Pre-emergence and Post-emergence Control of Crabgrass and Dollar Spot Control. Tony Koski, John Street, and Karl Danneberger, all from Ohio State University's Department of Agronomy, presented their findings on Selective Control of Tall Fescue in Kentucky Bluegrass. According to the researchers, no herbicide is presently labeled to control this species selectively, so they evaluated three products for their ability to provide selective, post-emergence control of tall fescue — Glean (chlorsulfuron), E.I. DuPont de Nemours & Company; Hoelon (diclofop-methyl), American Hoechst Corporation; and EscortTM (no common name), E.I. DuPont de Nemours & Company.

Three plugs of Kentucky-31 tall fescue were placed in each plot in the Kentucky bluegrass range 75 days before the herbicide treatments were applied. The highest recommended rates of each herbicide were applied in single or split applications, with and without surfactant.

A single application of Hoelon at the highest recommended rate provided 98 percent control of tall fescue and 90 percent control was achieved before the second application of the split treatments was applied. The use of surfactant increased control only slightly. A high degree of phytotoxicity to the Kentucky bluegrass was associated with the single, full rate treatments beginning one week after application and lasting for six weeks, and some thinning of the turf was observed with all Hoelon treatments.

All Glean treatments provided 0 percent control of tall fescue. Some phytotoxicity to both tall fescue and Kentucky bluegrass occurred within a week after application, but disappeared within another week.

Escort provided 96 percent control within six weeks at the full, single application rate. The split rate provided 88 percent control and the use of surfactant did not improve control. No thinning of the turf was seen with any treatments, but some phytotoxicity was apparent with all treatments of Escort one week after application. However, it was noticeable only with the single, full rate treatment thereafter.

In their conclusions, the researchers stressed that none of the chemicals are currently labeled for tall fescue control in Kentucky bluegrass. Further research concerning proper rates and application timing, cultivar sensitivity,

and effects on root growth, disease incidence and stress tolerance must be conducted before these chemicals can be recommended for professional use.

Koski and Street also presented current research on late season nitrogen fertilization of 'Baron' Kentucky Bluegrass. Often termed "fall fertilization," proposed advantages include better winter color, quicker spring green-up, enhanced root growth, increased carbohydrate production and storage, and the production of a more drought- and disease-tolerant turf. According to Koski and Street, the first two claims have been proven through field studies; however, root growth stimulation has not been successfully demonstrated, they say. Thus, they began a study in October 1983 to compare the effects of five different nitrogen fertilization programs on the root growth of 'Baron' Kentucky bluegrass. They will also examine the production and storage of carbohydrates in the stems and leaves of the plant, since these carbohydrates may influence root production. They also plan to report on the degree of nitrate leaching occurring with these programs.

Future Field Day events will reveal the outcome of several research projects introduced at both the Michigan and Ohio turfgrass shows.

SURFLAN USERS GET SPRAYERS FREE

Free sprayers are available to users of Surflan[®] herbicide for landscape and nursery use. Lawn care operators can receive either a Solo backpack sprayer or a ChemLawn spray gun free with the purchase of 50 gallons of Surflan 4AS. Or, they can receive a Solo Hanjet compression sprayer free with the purchase of 15 gallons of Surflan 4AS.

This offer is available with either Surflan gallons or quarts bearing the white-

and-green Elanco label, purchased by August 31, 1986. An order form for the sprayers is available from distributors of Surflan for landscape and nursery use or from Elanco Specialty Products, Lilly Corporate Center, Indianapolis, Indiana 46285.

The Solo backpack sprayer is equipped with a pressure regulator and a two-nozzle spray boom. It holds 4 gallons of spray and is manually operated for complete mobility. The ChemLawn spray gun is available with a choice of nozzles, either providing 4 to 5 gallons-per-minute or 2 to 3 gallons-per-minute. The compression sprayer is a rugged hand-pump unit delivering 2.5 gallons of spray.

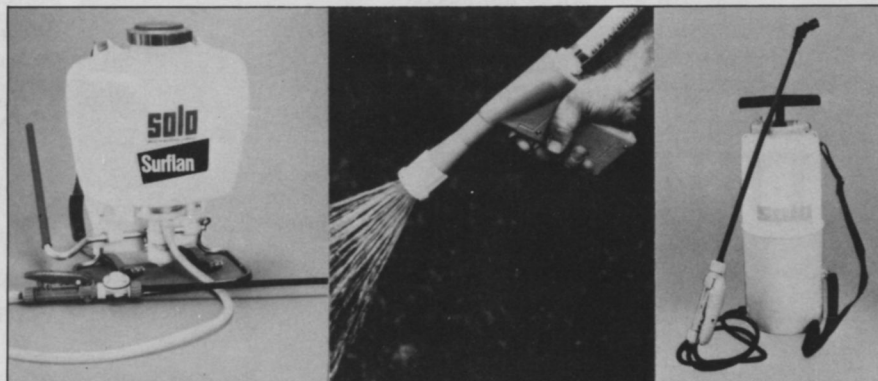
Surflan 4AS is a selective herbicide for use on ornamental plants, trees, shrubs, and many other plants. It keeps out a broad spectrum of weeds for up to eight months, with sufficient safety to be applied over the top of ornamental plants. It can be combined with Roundup[®] to kill existing growth and provide long-lasting weed control with one application. Surflan also can be used in established Bermudagrass turf as a pre-emergence control for crabgrass, goosegrass, *Poa annua*, and other annual grass weeds.

FOUNDATION ANNOUNCES DESIGN WINNERS

The Landscape Design Awards (LDA) Foundation has announced its 1985 national and statewide winners in the landscape design competition. This year the Foundation received 380 entries in both the professional and student divisions. The eight national and 17 statewide winners shared \$10,000 in cash, scholarships, and prizes.

First-place awards for the professional division were presented to James Hiss of Ohio State University, Colum-

(continued on page 20)



Free sprayers available with the purchase of Surflan for landscape and nursery use include a Solo backpack, a ChemLawn spray gun, and a Solo compression sprayer.



That's an exceptionally strong statement, Ray. But let's start with the product. Is it something new?

"We're talking about pre-emergent turf herbicide products using pendimethalin, and this is the first time they've been widely available to lawn service companies."

And you can back up that statement about Scotts pendimethalin products being the best? "I sure can... with over six years of extensive formulation and field research."

What makes pendimethalin so good? "Its broad-spectrum action. Look at all of the tough grassy weeds it controls—crabgrass, goosegrass, foxtail, barnyard-grass, fall panicum, and *Poa annua*."

What broadleaf weeds does it control? "Oxalis, prostrate spurge, chickweed, cudweed, hop clover, henbit, and eveningprimrose. And soon we may be able to add to that list."

That sounds good, but how long does it last? "It provides excellent residual activity... four to five months for most weeds when properly applied."

How many species of turfgrasses can I use pendimethalin on? "Right now, it's labeled for use on nine species of established cool and warm season turfgrasses."

What forms does it come in? "Four. In addition to water-dispersible granules, we also offer three exclusive ready-to-use dry-applied products—a fertilizer/pendimethalin combination and two straight pendimethalin products—one for cool-season grasses and one for warm-season grasses."

And how much does it cost? "On a square-foot basis, the price is very competitive. Factor in the broad-spectrum action and residual... which should reduce callbacks... and Scotts pendimethalin products become an unbeatable value."

For more information about pendimethalin turfgrass herbicide, call Scotts Lawn Care Service Supply Division at 800-543-0006. In Ohio, call collect 513-644-2900.

"You can't get better pre-emergent control of grassy and broadleaf weeds... or a better value."

Ray Huey, Scotts project leader (Herbicide Research and Development), talks about Scotts pendimethalin-based turf products.

Write 48 on reader service card



NEWS

(continued from page 18)

bus, Ohio — Small Lot; Elliott/Maloney of Riverside, California — Small Lot; Frank Bellomo of Kerry Blind Associates, Inc., Winter Park, Florida — Large Lot; and Patricia Bestor of Madison, Wisconsin — Backyard Environment. Student division first-place winners are Matthew Tsugawa of California State Polytechnic University at Pomona — Small Lot; and Clayton Pruitt of Purdue University, Lafayette, Indiana — Large Lot.

The competition is open to landscape architects, designers, landscape contractors, and students. Each entry is judged purely on design with three separate categories for the professional and student divisions. The basis for judging is 25 percent on creativity, 25 percent on use of materials, 25 percent on graphics, and 25 percent on sensitivity to the hypothetical client's lifestyle. Each entrant receives the same problem statement, scaled plot plan with elevations, and written instructions.

Full-size blueprints of this year's first-place national winners are available along with the judges' comments and critiques on audio cassette. The cost is

\$30 postage paid and may be ordered by credit card by calling toll-free: 1/800-352-1985. In Arizona, please call: 602/829-1361. Requests for information on the 1986 awards competition should be addressed to the LDA Foundation, P.O. Box 25277, Tempe, Arizona 85282.

TWO PRO-PESTICIDE GROUPS INCORPORATE

The fourth annual meeting of the Alliance for Environmental Concerns, Inc. (AEC) was a celebration of the organization's new incorporated status. It is now incorporated as a not-for-profit organization in the State of New Jersey. Speakers at the meeting included: Raymond Ferrarin, Chief of the Bureau of Pesticide Control in New Jersey; New Jersey State Senator C. William Haines; and Peter J. Furey, Secretary-Administrator of the New Jersey Farm Bureau.

In other news from AEC, New Jersey turf chemical applicators may find relief in a recent decision made by the state's Governor Kean. According to AEC Executive Director Ilona Gray, the governor was alarmed by the wave

of insurance cancellations for town, schools, and small businesses, and has announced regulations barring insurance companies from dropping such coverages.

"In this unusual emergency order, insurance companies are prohibited from raising premiums in the middle of a policy's department approval if it decides not to renew a liability policy," Gray writes in her monthly AEC newsletter. "The order is effective immediately, but is not retroactive." At least half of New Jersey's towns and a fourth of its school districts have been unable to obtain insurance against pollution liability. "With company like this," Gray says, "maybe now we can get some relief."

The Professional Pesticide Users of Connecticut (PPUC) also recently incorporated and has been receiving support from several sources, the first being the Connecticut Association of Golf Course Superintendents. Originally formed to combat proposed state ordinances regarding pre-notification, the pro-active group of professionals continues to be concerned with pesticide environmental issues and the impact of future legislation in their state. Pamphlets, applications, and

(continued on page 22)

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Introducing two outstanding additions to the Tuflex Family—the 1200C Fiberglass Tank and the 0100CL Torpedo Tank. Both add up to solve your toughest pest control and lawn care needs.

Start off with the big 1200C Fiberglass Tank. It holds a whopping 1130 gallons. And its attractive cylindrical shape makes for easy mounting on your flatbed truck, or conveniently mount it directly to your truck frame by using the mounting legs. Plus, the 1200C can be

compartmented. It features two sets of stainless steel hatch hardware, two double seal internal hatches, outlet fitting, and two calibrated gallonage indicators.

For the finishing touch Tuflex shines with the 0100CL Torpedo Tank. Add it to your existing main tank. Or, add it to your tough 1200C for an unbeatable uniform combination. The 0100CL (105 gal.) is easy to install and features two 12" fillwells with covers, outlet fitting, ball check vent and calibrated gallonage indicator.

Best of all, Tuflex is the only manufacturer to specialize in handcrafted, seamless fiberglass spray tanks—built specifically for your industry, so you know you're getting the best.

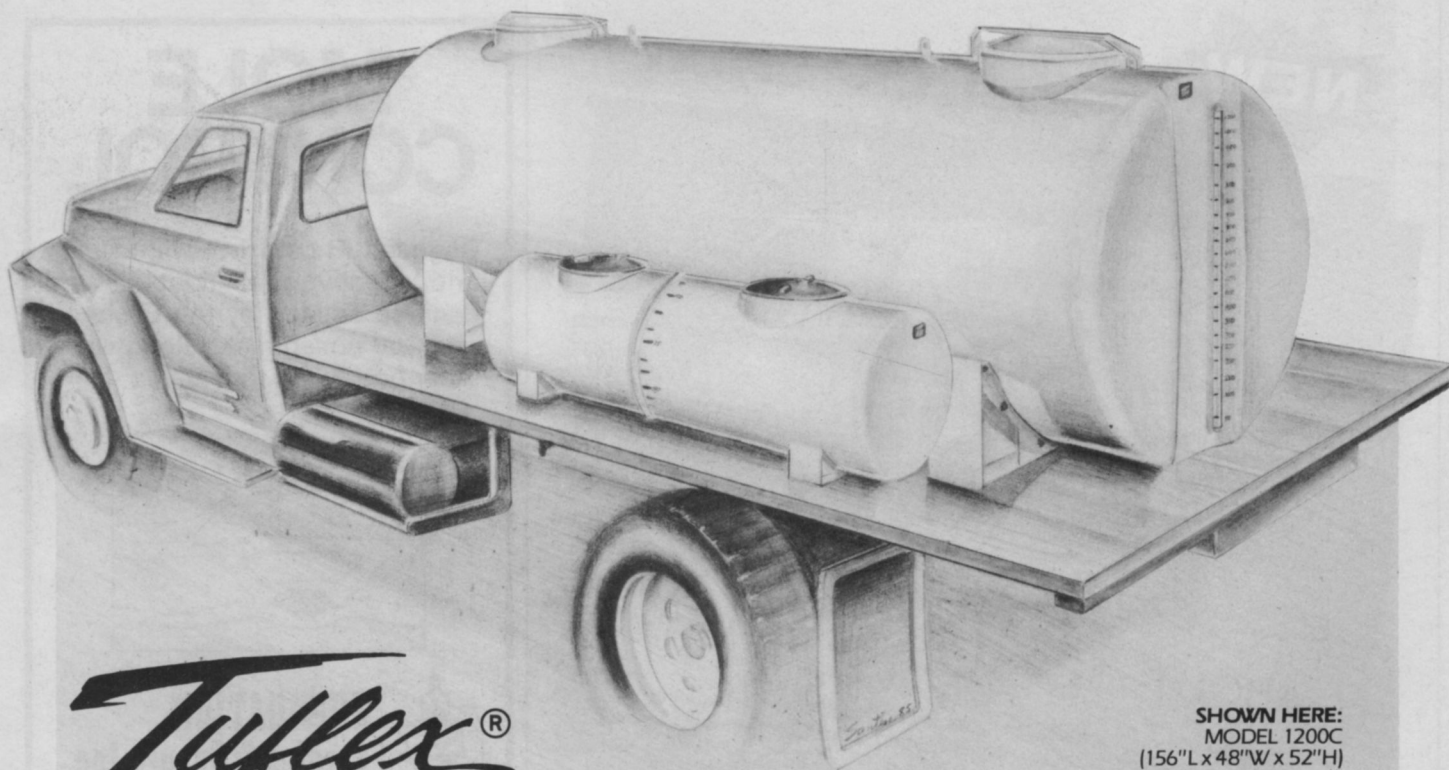
All Tuflex tanks are covered by the Tuflex five year warranty. Our personalized service includes professional assistance in determination of your specific tank needs.

Add all this up and you get approximately 1300 gallons of dependable, hard working tanks.

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For more information on our complete line of seamless fiberglass tanks, call toll-free 1-800-327-9005. in Florida call collect (305) 785-6402.

NEWS

(continued from page 20)

membership letters have been printed, and over 500 brochures were distributed at the Connecticut Tree Protection Association summer meeting.

TWO MANUFACTURERS MARK MILESTONES

Nearly 1,000 dealers recently met in New Orleans, Louisiana, to celebrate Kubota Tractor Corporation's 25th year of tractor manufacturing. In addition to the silver anniversary celebration, the event commemorated a milestone in the company's history — the sale of one million tractors.

In addition to exchanging successful sales techniques with each other to strengthen sales growth in 1986, dealers also were able to see the newest models of the Kubota line and meet with top executives from the firm's national headquarters in Compton, California.

The G6200HST, B9200, and B9200HST, as well as a new set of tractors in the M-Series agricultural line, were unveiled at the two-day meeting. The five new models in the M-Series



John Deere introduced nearly 50 new products at dealer meetings this fall.

are each being offered in utility and low-profile models. All have been designed with direct-injection engines to assure easy start-up, while also providing stingy fuel consumption. The models are available in two-wheel or four-wheel drive and are equipped with front differential lock with a new automatic system.

The 16-horsepower G6200HST will be Kubota's most powerful lawn and garden tractor. The new G-Series trac-

tor has one-speed front power take-off (PTO), with rear PTO optional. The diesel-powered, three-cylinder tractor is designed to accommodate a mid-mount mower, a front blade, a rotary tiller, and a snow blade. Kubota plans to introduce the G6200HST early in 1986.

The latest addition to the B-Series line is the 16.0 PTO horsepower B9200. Built specifically for landscape contractors, estate caretakers, nursery operators, sundowners, and farmers needing a small, yet durable, tractor, the B9200 utilizes a four-cylinder, water-cooled diesel engine. It comes equipped with nine forward and three reverse speeds. The B9200 is expected to hit the market next spring.

John Deere has also been celebrating recently. Deere & Company has marked its 23rd anniversary in the outdoor power equipment industry. To commemorate the event, the firm introduced nearly 50 homeowner and commercial products and models to more than 3,000 dealers and salespeople at a series of dealer meetings this fall.

Deere told dealers the company was moving forward on two sales fronts — adding features while reducing costs of

(continued on page 24)

NEW

SPREAD OR SPRAY



ABOUT \$340.⁰⁰ PER MONTH

Leases LV spray truck with fiberglass styling, hatchback compartment, locking spreader bracket, and Injection Gun. Other Models available.

Tom Jessen

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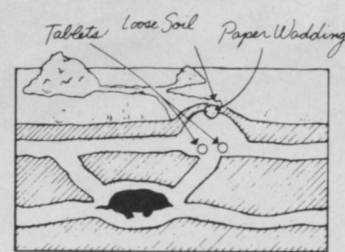
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- Annual Bluegrass Suppression
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- Fairway Renovation
- Computer and the Superintendent



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

NEWS

(continued from page 22)

homeowner products, and expanding the commercial product line for professional groundskeepers. At the meetings, Deere introduced two diesel-powered commercial front mowers and five implements for its gas and diesel front mowers.

"In late 1984 and early 1985 we began selling our first mowers designed specifically for professional groundskeepers — the gas-powered F910 and F930," says Mark Rostvold, Director of Consumer Products. "We are now following up on our commitment to the commercial market with two diesel front mowers and new implements to make them even more versatile. Our large network of servicing dealers is making a big impact in the commercial market," he says.

Deere also announced the development of a new series of hydrostatic compact utility tractors — the 16-horsepower 655, the 20-horsepower 755, and the 24-horsepower 855. Other new products introduced for commercial operators include three new skid-steer loaders, a high-clearance tractor with offset seat for truck gardeners and nurserymen, weather enclosures for

front mowers and tractors, two high-pressure washers, and two gasoline hedge trimmers.

LANDSCAPERS SERVICE McDONALD HOUSE

The San Antonio Chapter of the Texas Association of Landscape Contractors (TALC) recently completed the landscape and irrigation installation at the San Antonio Ronald McDonald House. The Ronald McDonald Houses are built with the help of local donations in various metropolitan areas to provide a homelike atmosphere where terminally ill children and their families can reside



The San Antonio Chapter of TALC recently landscaped the local Ronald McDonald House.

during medical treatment.

The San Antonio TALC felt that the house would be enhanced by professional, functional landscaping and volunteered their services. TALC member companies and their supporters donated all materials, landscape and irrigation designs, and installations. Over \$75,000 worth of voluntary contributions were amassed before the total landscape project was completed.

"In an industry that is highly competitive, it is satisfying to know that when the need for a community project is presented, would-be competitors can willingly function as a group in support of others," says Frank Suarez, the TALC Project Coordinator.

OPARR RECRUITS NEW MEMBERS

Ohio Pesticide Applicators for Responsible Regulation (OPARR) recently began distributing a new membership form which details the objectives of the organization and asks for industry support. "What Will They Do To Us Next?" the brochure boldly asks.

OPARR is an association of individu-

(continued on page 28)

CHAOS IN YOUR OFFICE LAST SPRING?

Last week you thought we only had 300 lawns to do. Now, crabgrass is germinating and you're telling me it's more like 500?!

We've got 250 estimates over two weeks old?

You lost that list of dandelion calls? Now what are we going to do?

Practical Solutions has some good ideas that can help next spring be a little "greener". Our computerized Lawn Care System equips your company with a software management tool that will control costs and improve productivity.* See a complete demonstration at the PLCAA Trade Show in Tampa, or the Ohio Turfgrass Conference in Cincinnati.



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Like
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Here's a scary one.
You're the victim.

Once upon a time, a powerful, well-financed coalition of special interest groups set out to severely limit the manufacture and use of pesticides. They used every means at their disposal, including fear and misinformation. They were wrong, and there was opposition, but the opposition was weak and disorganized and easily overcome. The result was an unmitigated disaster for our nation's health and economy. And if pesticides or herbicides were a part of your business, you were out of business.

True story? Only the first part. The ending has yet to be written. That's where you come in. **WE NEED YOUR HELP.** We are the Pesticide Public Policy Foundation (3PF).

We are asking you to stand up for your rights! The only way we are going to defend them is through cooperation and involvement. **Call us toll-free at 1-800-438-7773,** and we'll send you more information.



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Tuflex offers you a full line of tanks to solve your pest control problems, big or small. The experts at Tuflex carefully research and analyze your needs and assist you in designing and engineering the right tank and pump system to your specific requirements. Anything less would be a compromise solution.

Tuflex is the only manufacturer to specialize in seamless fiberglass spray tanks built specifically for the pest control and lawn care industry. The exclusive Tuflex process allows a full five-year warranty on all hand-crafted seamless fiberglass tanks.

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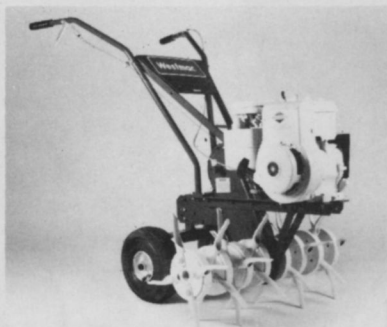
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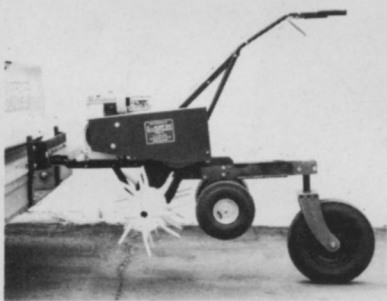


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the Westmac cores up to 4", depending upon soil conditions leaving 60 holes per sq. yd. so water, air and fertilizer can penetrate through thatch to reach the roots immediately, to help build and expand the root system.

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WESTMAC "TRAIL-HITCH" PACKAGE...

Also available is the Westmac "Trail-Hitch" that enables the Westmac to be plugged into the back bumper of any vehicle for towing plus backing up without jack-knifing. Once plugged into a vehicle, a high speed swivel-wheel drops down from the Westmac for safe transportation.

LESS THAN 60 SECONDS is required by your applicator to disengage the Westmac from your vehicle and be on the lawn for the fastest job of plug aeration you have ever seen. No need for a trailer or a 2nd man to lift aerator off/on a truck.

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NEWS

(continued from page 24)

als and businesses involved in the use of pesticides, representing all commercial pesticide users throughout the State of Ohio. The organization firmly believes that licensing and regulation have already been properly established at the state and federal levels, and that additional regulation at the local level will only complicate the issue and burden pesticide users with more paperwork.

OPARR is providing the public and regulatory officials with accurate information about the true nature of pesticides and their value to our society. And it is working to insure responsible, effective legislation, and not excessive regulation. The organization has hired former state legislator Jim Betts to represent OPARR in Columbus, and to make sure the industry's voice is heard whenever new environmental legislation is introduced that could affect the businesses of OPARR members.

The group is actively seeking new members as well as volunteers to help with OPARR projects. If you are interested in joining OPARR or actively participating in the association, write: OPARR, 1215 Terminal Tower, Cleveland, Ohio 44113; or call OPARR President Lauren Lanphear, 216/381-1700, or Executive Director Jim Betts, 216/781-1212.

AMES TOOLS SPONSORS SYNDICATED TV SHOW

Ames Lawn and Garden Tools will be a 1986 sponsor on a nationally syndicated television show, *The Weekend Gardener*.

er. Starring Jim Bennett, this popular gardening show is syndicated to over 61 network and cable stations and reaches an audience of over 40 million homes each week.

Bennett will be the spokesman in the two commercials for Ames. One spot will feature the Ames hose reel line and the other will focus on the 1986 "Takeoff Ticket" Rebate/Sweepstakes promotion.

The commercials were produced by *The Weekend Gardener* and filmed at their studios in Aiken, South Carolina. Fahlgren & Swink Inc. directed them. Dealer co-op versions of both commercials are available for local TV buys. For more information on *The Weekend Gardener* spots, contact your Ames area sales manager or call Michael Deitsch, Ames Marketing Manager, 1/800-624-2654, ext. 3263.

DAVEY MOVES INTO NEW HEADQUARTERS

Until a few months ago, some 160 administrative employees of Davey Tree Expert Company had offices scattered among leased facilities in Kent, Ohio, including an office atop a drugstore that accommodated Chief Executive Officer Jack W. Joy. However, the employee-owned company, which grossed more than \$5 million in 1984, recently moved into its new Williamsburg-style headquarters developed on 22 of the 54 acres acquired by Davey in Kent. According to the *Akron Beacon Journal*, the 42,000-square-foot building cost \$4.2 million.

Although the outside decor of the building looks much like a Colonial-style chapel, with an arched doorway



Pictured after a hard day's work of filming two commercials for *The Weekend Gardener* (TWG) are: (left to right) Sheri Fallow, TWG Field Assistant; David Murray, TWG TV Production Director; Mike Butcher, Senior Art Director with Fahlgren & Swink; Fred Humes, TWG General Manager; Gary Hipps, TWG Cameraman; Mike Deitsch, Ames Marketing Director; Tom Crooks, Account Supervisor with Fahlgren & Swink; Halsey Swingle, TWG Cameraman; and (kneeling) Jim Bennett, TWG host.

leading to a steeply-pitched roof atrium, the interior contains all the conveniences of today's modern office. Movable partitions fit into tracks in the ceiling so offices can be divided or enlarged if needed, according to architect David Fenn of Tuchman Canute Architects Inc. of Akron, Ohio.

Next door to the headquarters is Davey's Human and Technical Resources Center, which houses laboratories a greenhouse, a library, and an audio-visual room.

NEW TURF GRASS ASSOCIATION FORMS

The North Central Turf Grass Association is currently being organized. According to Operations Manager Kevin Stayton, Dakota Pest Control & Green Lawns, Inc., Bismarck, North Dakota, the purpose of the Association is to promote the turf grass industry in North Dakota, Minnesota, Montana, South Dakota, and Canada. In addition, it is to encourage and support the further study and research of turf, disseminate information related to this study and research, and to represent this group in matters of policy regarding the turf grass industry.

The objective of this Association is better turf for all aspects of the industry, including athletic fields, cemeteries, golf courses, lawns, parks, roadsides, institutional grounds, industrial grounds, sod production, and other turf grass areas.

The first annual meeting and training seminar of the North Central Turf Grass Association will be held January 22-24, 1986, at the Kirkwood Motor Inn in Bismarck, North Dakota. For further information, please write: North Central Turf Grass Association, P.O. Box 7262, Bismarck, North Dakota 58502; or call Kevin Stayton, 701/224-1517 or Larry Wegerle, 701/222-0652.

HANSON-GENERAL ACQUIRES NEW PRODUCT LINE

The Hanson-General Products Corporation recently acquired the product lines manufactured and sold by General Hydraulics Corporation and Hanson Equipment Company. Located in South Beloit, Illinois, Hanson-General now offers a variety of lawn care equipment, including front-mounted snowblowers for Toro Groundsmaster 62 and 72, grounds maintenance sprayers, lawn and garden sprayers, and fiberglass tanks, to name a few things. ■

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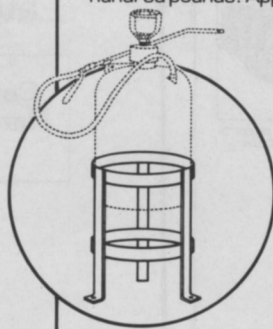
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PLCAA UPDATE

Every year the Professional Lawn Care Association of America's conference and trade show gets a little bigger and better. The trade show in Tampa this month will include outdoor equipment demonstrations in addition to the usual indoor exhibits. The following manufacturers will be in attendance at the outdoor demonstration area.

AmerSeal Tire Sealant

Tom R. Murray
1819 Bemis Road
Crete, Illinois 60417
312/672-6076

Dedoes Industries, Inc.

John Dedoes
1060 W. Maple Road
Walled Lake, Michigan 48088
313/624-7710

Exmark Mfg. Co. Inc.

Robert Martin
2101 Ashland Industrial Park
Beatrice, Nebraska 68310
402/223-4010

Green Pro Services

Richard Hawkes
380 South Franklin Street
Hempstead, New York 11550
516/538-6444

Lawn Masters, Inc.

James K. Gourley
P.O. Box 0636
Kenosha, Wisconsin 53141
414/552-8911

OMC Lincoln

Daniel L. Hedglin
P.O. Box 82409
Lincoln, Nebraska 68501-9581
402/475-9581

Professional Turf Equipment

John A. Latting
400 Northtown Road
Normal, Illinois 61761
309/454-2469

Specialty Equipment Co.

Payton Hage
7721 Pillsbury Ave. So.
Minneapolis, Minnesota 55423
612/861-7491

The Toro Company

James A. Link
8111 Lundale Ave. South
Minneapolis, Minnesota 55423
612/887-8851

Wheel Horse Products

W.J. Vance
P.O. Box 2649

South Bend, Indiana 46680
219/291-3112

Bunton Company

Bill Newton
P.O. Box 33247
Louisville, Kentucky 40232
502/966-0550

Denver Leasing and Manufacturing

Bob Smith
6803 Joyce Street
Golden, Colorado 80403
303/422-7608

Feldmann Eng. and Mfg. Co.

Myrtle Feldmann
P.O. Box 153
Sheboygan Falls, Wisconsin 53085
414/467-6167

Hahn, Inc.

Kent S. Hahn
1625 N. Garvin Street
Evansville, Indiana 47711-4596

LESCO, Inc.

Barb Craycraft
P.O. Box 16915
2005 Lake Road
Rocky River, Ohio 44116
216/333-9250

Olathe Manufacturing, Inc.

Steve Rogers
100 Industrial Parkway
Box 17
Industrial Airport, Kansas 66031
913/782-4376

Salsco Welding and Fabrication

Salvatore J. Rizzo
196 Clark Street
Box 544
Milldale, Connecticut 06467
203/621-6764

Spraying Devices, Inc.

Terry L. Stone
P.O. Box 3107
8333 Doe Ave.
Visalia, California 93278-3107
209/651-1306

Walker Mfg. Company

Bob Walker
1839 East Harmony Road
Fort Collins, Colorado 80525
303/226-1514

Classen Mfg.

A.T. Classen
1403 Roach Avenue
Norfolk, NE 68701
402/371-2294

Encap Products Company

Walter A. Houston
P.O. Box 278
Mt. Prospect, Illinois 60056
312/593-6464

Grasshopper Company

Rick Bressie
81 Hwy. South
P.O. Box 637
Moundridge, KS 67107
316/345-8621

(continued on page 82)

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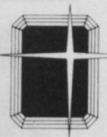
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PEOPLE

Dow Chemical announces the assignment of two industrial products specialists in its Houston office. **Irene Wallbaum** is promoted to distributor and formulator specialist for Dursban® insecticides. **Frank Wright** is named sales representative for Dursban products and Vikane® Gas Fumigant.

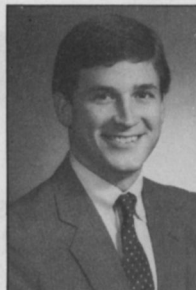
Wallbaum is serving pest control markets in south Texas and Louisiana. Her responsibilities include developing marketing strategies for Dursban L.O. low odor insecticide and Dursban T.C. termiticide concentrate in that region. She also assists formulators in developing their own product lines based on Dow chlorpyrifos.

After obtaining both her bachelor and master of science degrees in agricultural economics from Ohio State University, Wallbaum joined Dow in 1983 as marketing development program trainee. She was named sales representative for Dursban insecticides in 1984.

Wright is responsible for industrial pesticide sales in the south Texas, Louisiana, and Mississippi markets, working primarily with pest control operators. He began his career with Dow as a plant worker in Freeport, Texas while a student at Texas A&M University. After graduating with a bachelor's



David Kearsley



Trey Duren

degree in business administration, he worked for Armco Steel before returning to Dow in 1983. Before his appointment as sales representative, Wright participated in field research projects and the marketing development program.

Five individuals have received promotions from Rain Bird National Sales Corporation. **David Kearsley** has been promoted to the position of the company's National Accounts Manager. Kearsley joined Rain Bird in 1983 as the Colorado District Manager. He attended Georgia Southern College, graduating with a bachelor of business arts degree in marketing. **Trey Duren** has been appointed Colorado District Manager. Duren attended Georgia

Southern College with a bachelor of business arts degree in marketing.

Dan Pope has been appointed Area Specification Manager for Rain Bird's Turf Division. Pope's responsibilities include serving as liaison between Rain Bird management and landscape architects, irrigation consultants, and city and county officials. Additionally, Pope conducts irrigation seminars for various groups, including universities. His territory comprises Texas and Oklahoma. Prior to joining Rain Bird, Pope was in charge of sales for Irrigation Pipe and Supply in Houston. Before that, he was associated with the Houston-based A-1 Irrigation Supply.

Ron Wolfarth has been appointed Southern California Specification Manager for the company's Turf Division. Wolfarth's responsibilities are identical to Pope's, but his territory extends from Los Angeles County north to San Luis Obispo, Bakersfield, and Las Vegas. A licensed landscape architect, Wolfarth brings more than 13 years of industry experience to his new position. Prior to joining Rain Bird, he served as irrigation and water management consultant. He has also been associated with the landscape architect firms of Closson and Closson and Olson Associates, of Orange County.

Mary Ann Baumgaertner has been appointed Product Manager for the company's Turf Division. In her new position, Baumgaertner coordinates the development of new products and the modification of existing equipment. Additionally, she determines areas of product development in the irrigation market. Prior to joining Rain Bird, Baumgaertner was a pharmaceutical sales representative for The Upjohn Company in Los Angeles. A resident of San Dimas, she earned her bachelor of arts degree in human biology from Stanford University.

Sandra K. Kraft has joined Pinto and Associates as Vice President after successfully designing and implementing a mosquito control program for Fairfax County, Virginia. Before that, she conducted research on cockroaches and made pest identifications and control recommendations as a state extension specialist. Kraft developed and produced videotapes on integrated pest management for the Agency for International Development. She was also Project Head of the Gypsy Moth Information Service of the U.S. Forest Service.



Robert A. Russell (right), President of J and L Adikes of Jamaica, New York, received an Award from Norman M. Rothwell (left), President of Rothwell Seeds Ltd., of Ontario, Canada, at the recent American Seed Trade Association Convention in Nashville, Tennessee. The plaque was presented in recognition of enthusiastic support for The Lawn Institute and for inspiration and leadership instrumental in the development of policy and programs.

Kraft has a bachelor of science degree in biology from the University of Colorado and has a master of science degree in entomology from the University of Maryland. Pinto and Associates provides entomology expertise for industry, government, and the general public.

Kathy M. Yeager has joined Tolco Corporation, Toledo, Ohio as its new Advertising Manager. Yeager has a 1980 bachelor of arts degree from Ohio State University in journalism, public relations. Her previous experience includes brochure development, advertising layout, press releases, photography, and management experience. She will be responsible for sales promotion at Tolco, including the selection of new products, product introductions, literature design, advertising, press releases and media contact, trade show development and presentation, and art for bulk mailing and dark room setup.

The Andersons of Maumee, Ohio, has honored C.O. Lowe Sales of Columbus, Ohio, with its top distributor awards. Lowe Sales was named The Andersons' Distributor of the Year, and became the first Tee Time® products distributor admitted to the firm's \$300,000 club.



Clarence Lowe (left) of C.O. Sales receives the Distributor of the Year award from Doug Masters.

Clarence Lowe has been involved in all phases of the turf care business for over 30 years, and has been a supplier of turf care fertilizers, chemicals, and equipment to golf courses, lawn care

service companies, municipalities, and landscape firms for the past eight years. He has been a distributor for The Andersons lawn care fertilizers and chemicals for five years. ■



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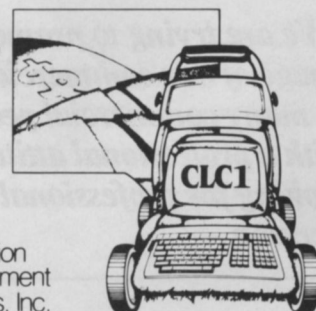
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PERSSSON-AL TOUCH

A lot of people talk about improving the lawn care industry, but Chomie Persson is actively promoting our industry's interests to the public and to politicians.

It is easy to complain about the problems facing the lawn care industry, but it takes real dedication to confront those problems. Gelorma "Chomie" Persson of Little Silver, New Jersey, confronts lawn care and other small business problems on a daily basis. She not only sells and services outdoor power equipment as Vice President of Little Silver Repair Center, Inc., a business she operates with her husband Richard, but she is also involved with promoting the interests of all small business people in New Jersey. Persson is Immediate Past President of the Small Business Unity Council of New Jersey, charter member and former Legislative Chairperson of the New Jersey Association of Women Business Owners, and has her own "Persson to People" half-hour weekly Storer Cable Television program, to name just a few accomplishments.

Persson can trace her interest in the lawn and garden market back to her childhood when she helped her parents operate their flower shop. About 20 years ago her husband opened the Little Silver Repair Center, Inc. "As he was getting busy, he really needed help," says Persson. "I'm the organizer of the family, so I came on board when our children were young. Then I found I was really stymied because I knew nothing about engines."

Acting on her husband's encouragement, Persson attended community college to become certified in

college, but was not the only woman in class.

Although the company did not cater to professionals in its early years, Little Silver Repair Center now sells and services commercial mower lines as well as homeowner models. With about 300 commercial customers, Persson considers herself a large commercial dealer and gives commercial operators service priority. "We have survived even through the economic crisis, because we deal with the commercial person who has to depend on us for service," says Persson. Her company also conducts a seminar and open house each year for commercial mowing operators to teach them how to better run their businesses.

"We are trying to promote the professional image of our commercial applicator," says Persson. "We make them aware of how they can best take care of their equipment. There are so many commercial people going into business with a professional attitude, that people are looking for professional lawn care. I would say there is a really marvelous growth potential out there for the commercial user."

Persson became involved with defending the business needs of lawn and garden operators and other small business people because she recognized a lack of unity among them that translated into missed business opportunities. For example, Persson says New Jersey lawn and garden operators are missing out on federal and state government procurement opportunities because they lack bidding protection. "I found we were bidding against our own distributors," says Persson. She is a John Deere and Toro dealer and was bidding against both companies directly for equipment purchases. Persson found she could not compete with the higher discounts offered by both the distributors and company representatives of the products she also handled.

So she decided to do something about the unfair trade imbalance. "We have a group of John Deere dealers throughout our tri-state area and I became their president and spokesperson for the past eight years," says Persson. "Any discrepancies I find, I set about correcting." Persson was elected as one of 18 national lawn and garden equipment dealer spokespeople at a recent White House conference attended by 500 delegates. "Through networking there," says Persson, "I was given a congressional appointment. It was the first of its kind at an advisory board level."

Persson was one of two New Jersey residents to meet with President Carter at the White House Confer-

"We are trying to promote the professional image of our commercial applicator...There are so many commercial people going into business with a professional attitude, that people are looking for professional lawn care." — Chomie Persson

small engine repair. But she soon found herself virtually alone in a male-dominated industry. At first she was not taken seriously, so she had to assert herself to gain respect from customers and equipment manufacturers. But times have changed. Persson's oldest daughter, Syndra, 29, joined her parent's business and took small engine courses recently at the same community



Chomie Persson, Vice President, Little Silver Service Center

ence on Small Business Affairs in September, 1979. The meeting was intended to give Carter recommendations to help solve the small businessman's problems, according to Persson. She believes Carter understood the small businessman's needs.

Persson's most notable successes in her battle for fair trade practices for small businessmen have come in her home state of New Jersey. One of Persson's pet crusades has been securing the small businessman's share of the million dollar equipment bid for the State of New Jersey. "I wanted part of that bid set aside so the small people could get their share of the pie, not only the John Deeres and Toros," says Persson. "I didn't want to short-change the state and have the state pay more because of it, but I wanted a fair shake. That's happened. It was signed into law July 15, 1984."

When Chomie Persson isn't lobbying politicians or working at the repair center, she can most likely be found at the television studio taping another installment of her "Persson to People" program. Her television career began at the suggestion of local cable television executives who had been following her involvement with small business concerns. First, she had a half-hour local cable television show, then her show was expanded to an hour. The program was recently picked up by New Jersey Cablevision and is broadcast statewide six days a week. Persson explains that since the shows are taped in advance she can still work in the lawn and garden shop six days a week.

The program is designed to air some of the problems that beset the small business community. Since she watches very little television, Persson says she had no idea what was expected of her at first. "I went in cold and I have been treating it the same way ever since,"

says Persson. "I seem to know all the problems and I belong to 15 business organizations, so I know the local problems." After almost three years on the air, Persson could hardly be called a seasoned veteran, but she does have all the logistics worked out. The shows consist of a series of interviews with small business people which she produces and directs without a script. She seems to carry the conversation naturally. "I seem to have a way of eliciting information from people."

Each show is conversational in nature. Persson discusses a wide range of topics and cites ways to solve a given business problem. In addition to helping small business people with their problems, Persson hopes to promote a positive image of her industry. "I have done a great job for the service industry in that I've made people see that although we work with grease all day, we are intelligent human beings," says Persson. "My very personal crusade is to uplift the image of the mechanic. In our shop we have three people who are college graduates."

Though much remains to be done, Persson predicts a bright future for the lawn and garden industry. "I see excitement," exclaims Persson. "People are becoming more health conscious, consequently they are depending on power equipment to assist them." She says 1985 has been a fantastic year for the industry and her company as well. They opened a second branch headed by her son and a partner. Persson notes the importance

Persson notes the importance of selling quality products in a business built on service. "When you have to service what you sell, you make damn sure you are selling what you can back up. You are only as good as the products you sell."

of selling quality products in a business built on service. "When you have to service what you sell, you make damn sure you are selling what you can back up. You are only as good as the products you sell." — *Tim Weidner* ■

The author is Managing Editor of ALA magazine.

AERATORS: A REPORT FROM THE FIELD

Home lawn aerating is becoming increasingly popular. If you have been thinking about jumping on the bandwagon, now is as good a time as any — but look before you leap!

More than any other service profession, it seems as though lawn care operators are always searching for new ways to supplement their incomes. The reason can probably be traced to the seasonal nature of the business, especially for northern businessmen. In a seasonal occupation, you have to find as many ways as possible to make money before the turf becomes dormant for the winter.

One "add-on" service many lawn care operators are turning to is aerating. Unfortunately, there seems to be a lot of confusion over aerator performance and the logistics of getting into this business. This perceived confusion prompted us to survey 500 of our readers to find out what the average lawn care businessman expects from an aerator. The accompanying article, "Aerator Survey" on page 41, is a report on the results of the survey.

At the bottom of the survey form, respondents were given the option to fill in their names, addresses, and phone numbers if they wanted to be contacted for further comments on aerating. Of the respondents who graciously listed their names and numbers, we chose those who also indicated in the survey that they were currently offering aeration to their customers. We called on these businessmen because we wanted input

One "add-on" service many lawn care operators are turning to is aerating. Unfortunately, there seems to be a lot of confusion over aerator performance and the logistics of getting into this business.

from people who are working with the machines on a daily basis.

TIMANDA NURSERY. George Jones has been working with aerators for two years at Timanda Nursery in Knoxville, Illinois. Jones reports that he has \$1,200 invested in two machines and charges 1/2 cent per foot on an aerating job. He explains that he is more interested in establishing his aerating business than in making a profit right now.

"It is very new in this area," says Jones. "Just trying

to get people involved is a challenge — they are all going to the rental centers and trying to rent one. The rental centers do not have them. There is too much investment involved with them."

But Jones got involved and claims he can knock off a 15,000-square-foot yard in one hour, given good conditions for the aerator. The two aerators he currently has in service are an old Ryan experimental core aerator and a new Ryan Lawnaire® walk-behind type core aerator. Jones purchased the old Ryan unit from a nearby outdoor power equipment manufacturer when the manufacturer moved its operations out of the area.

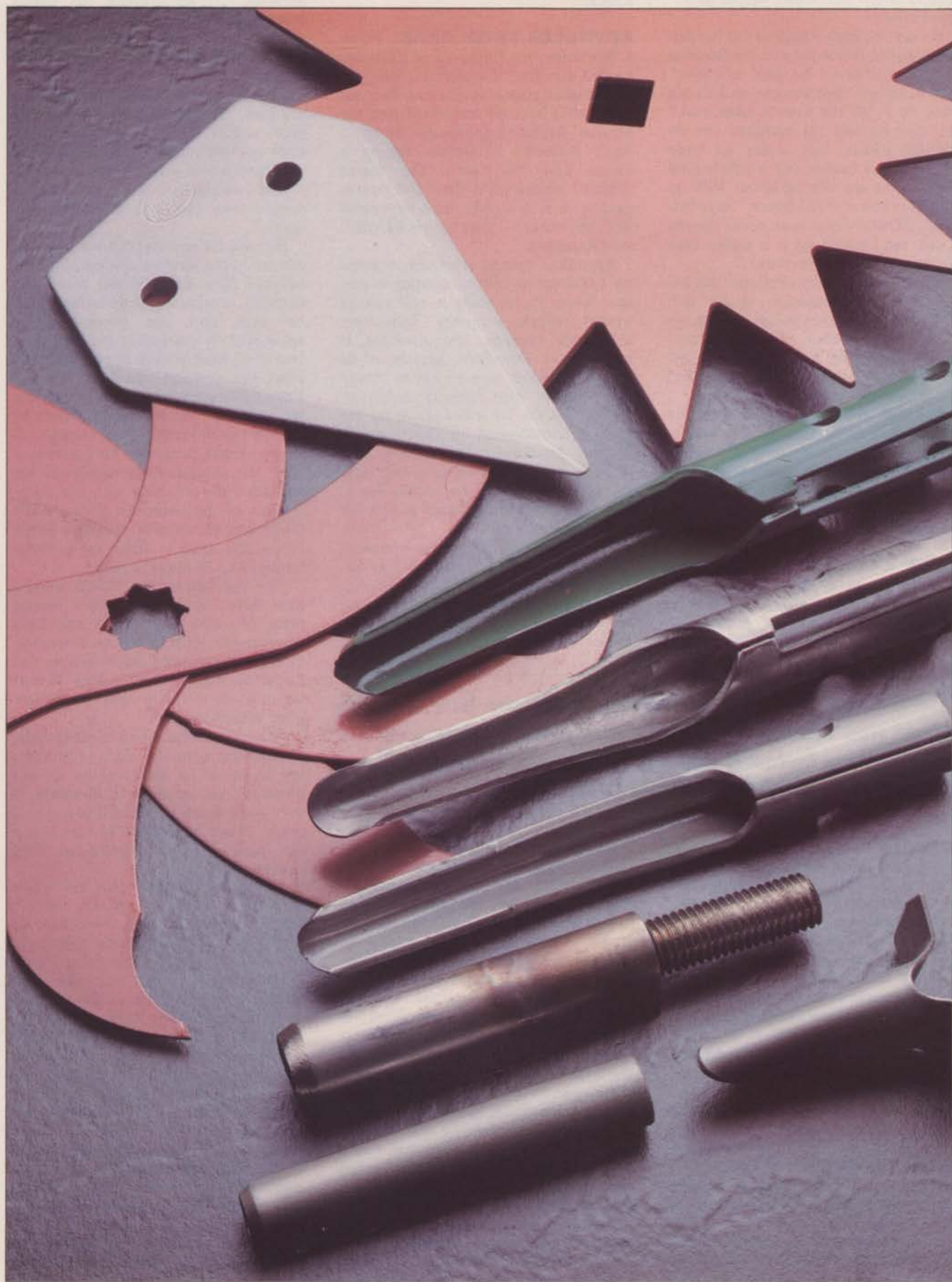
When he acquired the machine, it didn't even run and he is not too sure about its origins or intended use, but he got it running and has been using it on such turf areas as a local football field. "It is just such an old contraption, but it does a heck of a good job," says Jones. However, he will have to give the old machine low marks for operator comfort.

On the other hand, he is quite impressed with the quality cores pulled up by the old aerator. He only wishes the new Lawnaire would core as well. "It is leaving about half of the core in the ground," says Jones. He believes the difference in coring ability can be attributed to the different type of tines on the two machines. The old machine has closed coring tines, while the Lawnaire has open-sided coring tines. He also complains that if the ground is wet, the Lawnaire will tend to tear the turf.

But Jones does like the Lawnaire's maneuverability. "We don't have any problems there whatsoever," says Jones. "I don't think a rider would be able to get into the places we're able to get into and do a thorough job." Jones realizes there are other walk-behind core aerators on the market, but availability is a problem for him. "There is no dealer around here for me to even look at one. I had to go 60 miles from here to get this one, and that place closed down."

CHEMLAWN. Mike Pelletier, Branch Manager of the ChemLawn Corporation branch in Clarion, Pennsylvania, has a little more invested in his aerating operation than Jones. Pelletier has been aerating for about three years now and has about \$12,000 invested in 12 machines. His aerators include Hahn JR4s®, a couple drum-type Ryans, Ryan tractor pull-behind units, and Westmac® spoon-type aerators.

Pelletier charges his aerating customers based on the size of their lawns, with a minimum charge of \$25. His graduated fee scale starts at \$8 per 1,000 square feet



of lawn and descends with increased square footage. "On lawns around 50,000 square feet we are only charging around \$5.50 per 1,000 square feet," says Pelletier.

He says he hasn't figured out his aerating profits. It is listed as miscellaneous income. "It would be hard to chart," says Pelletier, "but you can make a big buck on it for the time it takes you." He says he and his assistant can do 300,000 square feet a day on large lawns with a tractor and a pull-behind unit. "You are talking about \$900 to \$1,000 in about seven hours," says Pelletier. "Profit-wise I have never figured it out, but I would say it is higher than 10 percent (of gross income)."

The biggest problem Pelletier has encountered is penetration of dry soil. "The soil in this area is just so doggone hard," says Pelletier. "It is hard, compacted clay with a lot of sandstone. Then when you get adequate moisture, it is almost too muddy."

Pelletier actively sells his aerating service by mailing brochures to his existing lawn spray customers in August. When the customers request the service, they are scheduled and serviced in the fall. "It is an excellent way to supplement income."

LAWN MEDIC, INC. P.J. Lenihan, Vice President of Lawn Medic, Inc., Kernersville, North Carolina, has been doing aerating since he joined the company in 1974. However, he says his

aerator that wasn't prone to bending or breaking tines. "We either bend or break the tine off when we hit a root or a rock."

REYNOLDS LAWN CARE. Frank J. Reynolds, Jr., President of Reynolds Lawn Care, Inc. of Hamden, Connecticut, is still a rookie at aerating after just completing his first year of offering the service. Reynolds previously owned a Ryan Rideaire I® before buying a Salsco unit this year. "The Salsco model I purchased is their golf course model, so it is a little more expensive than the norm — their unit is \$4,500," says Reynolds.

Reynolds' pricing schedule is based on 1,000 square feet of aerating coverage. Since he is using a golf course model which punches holes on 2-1/4-inch centers, the machine is rather slow. Therefore, because of its speed, Reynolds says he has to charge much higher than industry standards. He says his service is not priced for the average homeowner, but rather, a core aerating service for those lawns that really require it and those people who are willing to spend the money for it. His pricing schedule starts at \$15 per 1,000 square feet.

"Because of the size of our company, we have a pretty good one-on-one rapport (with customers)," says Reynolds. "Those people who need core aerating are aware of it; they have been instructed for a number of years that the ser-

tomers and he knows their lawns' histories, he can control the thatch situation and cut back on the labor involved in aerating. "If we monitor the thatch level prior to selling, if the thatch level is less than 1/2-inch, then we can allow the cores to remain and one man can provide the service," notes Reynolds. "If however, the thatch is greater than 1/2-inch, the amount of debris is too great and at that point, another crew goes out and rakes up the debris. You still have a one man operation from a coring standpoint, it is just that a second crew comes in to remove the cores."

He says his customers have been receptive to the aerating concept, partially because New England soil conditions demand mechanical cultivation. Still, he says you can become over-aggressive in marketing the service if you don't have a piece of equipment to meet the demand you have created. Reynolds experienced such a situation last year with the Rideaire I, which he couldn't keep running long enough between repairs to service his customers. (For the record, Cushman/Ryan has corrected the situation with the introduction of the improved Rideaire II®. Owners of the original Rideaire I may return the units to Ryan for reconditioning with Rideaire II parts.)

"By purchasing the Salsco unit, I now have experience with a second piece of equipment that I am really comfortable with," claims Reynolds. "One that has been quite reliable and has given me excellent quality. Unfortunately, it is not a very productive piece of equipment."

"The maneuverability is acceptable, considering what the piece of machinery is doing. Its ability to go around obstacles, get up close to obstacles, is very good. It can be difficult to run on a grade. It can be difficult to turn if you are doing a lot of turning on hard pavement."

Reynolds estimates that his single aerator operator puts in 50 hours a week on core aerating. However, he does not want to remain too aggressive in soliciting aerating customers since he is not quite certain what effect late season coring will have. Reynolds is worried he may get desiccation of the turfgrass plants over the winter. "Keep in mind I am on 2-1/4-inch centers; there is an enormous amount of holes being put into the ground," Reynolds points out. "If I provide that much mechanical injury late in the fall, my concern is whether or not the root systems in the turf will recover prior to the onset of cold weather. This is something I have to experience and formulate my thesis for next year."

Reynolds says a walk-behind core aerator requires some manhandling

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"Even if you own a lawn service business, you have to adjust your advertising to make sure you are advertising this machine (aerator) and it is not just sitting around." — Jay McNalis, Turftreet, Crystal Lake, Illinois

company has only started doing core aerating, as opposed to spoon or knife aerating, for the last two years. "We rented our equipment most of last year and the year before — just trying out different machines," says Lenihan. "Now we have two LESCO aerators that cost \$800 apiece." Lenihan charges his customers twice the cost of a regular spray application on a sliding scale with a minimum charge of \$48.

He estimates that the average home lawn takes about 20 minutes per pass and he generally has to make two passes. Like Pelletier, Lenihan says his biggest problem is dry soil. "We were not able to aerate much in September because we didn't have any rain," says Lenihan. "There weren't enough homeowners who irrigated enough to make it worthwhile."

But Lenihan has also had problems with machines. He says he would like to see a piston-type or cam-driven core

vice was necessary. We have not run into any objections to the figure."

Depending on the circumstances, Reynolds says his fee can run much higher than \$15 per 1,000 square feet. If his aerator operator is pulling up plugs on 2-1/4-inch centers on a bluegrass turf that has a thatch layer 1-1/2 or 2 inches thick, the amount of debris pulled up is excessive and must be raked off. "The amount of labor required, not only for the coring, but for removal of the debris, becomes quite significant," says Reynolds. "If I were attempting to meet the industry and be competitive with price, I would be looking at a piece of equipment that would make holes between 3-1/2 to 6 inches on center; one that would be much quicker than the one I'm using and would not require that you pick up cores when you have completed."

But since most of Reynolds' aerating customers are existing lawn spray cus-



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AERATOR REPORT

(continued from page 38)

and is not a job for someone weighing under 150 pounds. "With some of these walk-behind units I can see where it could be extremely fatiguing," says Reynolds. "Fortunately, we have a number of individuals who are 175 pounds plus and they are mechanically inclined. It is demanded that they go out in the parking lot and run the machine for 1/2-hour around trucks, buildings, etc., so they will grow accustomed to its maneuverability, its clutching mechanism."

"I weigh about 140 pounds. I wouldn't want to be out there on that piece of equipment much more than 1/2-day. I have done it, and by the end of the day I am quite fatigued. Yet, if you take an individual who weighs 175 pounds, he handles it so much better. It is really obvious what body weight does."

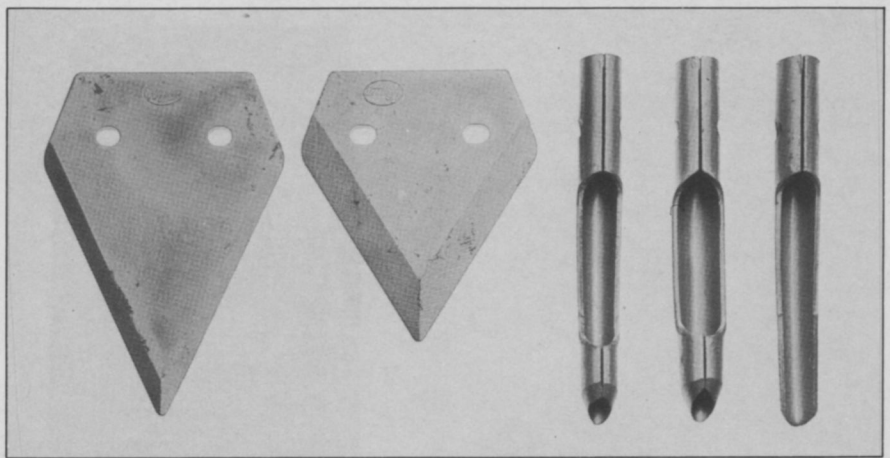
HYDRO LAWN. James A. Andersen, owner of Hydro Lawn of Canshacken, Pennsylvania, is now nearing the end of his second year of aerating and has invested about \$16,500 in aerators, trailers for his machines, and other accessories. He currently owns a Ryan "tag-along" unit and a Ryan Rideaire I which was reconditioned with Rideaire II parts by Ryan.

Andersen prices his aerating service at twice his usual lawn fertilization price per 1,000 square feet. He estimates that his aerating service generates about 14 percent of his gross annual revenues. As an indication of the commitment Andersen has made to aerating, he dedicated a crew strictly to this service.

Andersen likes to think of aerating as one facet of his multi-faceted lawn service. He also offers his customers dethatching and liming in conjunction with aerating. Andersen estimates that around 20 to 21 percent of his customer base receives aeration.

"With our lawn care program, we have five different options they can go for," says Andersen. "Two of them automatically include annual aeration, which has been a fairly popular option. The ones who don't elect for that option, we will sell them aeration separately." The aerating service is sold by the operator servicing the account. He will leave brochures and contact the client later. Although most customers are interested in aerating, Andersen says many have to be convinced of its value before they open their checkbooks.

Andersen began offering his customers aerating because he feels it is a valuable part of lawn care. "It helps break up compaction and helps reduce thatch build up. We are trying to offer a more complete lawn care program and



(Left to right) Slicing (2), coring (2), and spoon (1) tines. (Photo courtesy of Ryan)

felt this would be a valuable part of it."

TURFTREET. Jay McNalis is Manager of the Lawn Specialties Division of Turftreet/Country Gas Company in Crystal Lake, Illinois and has only recently made himself sole operator of his company's aerating operation. In the past, McNalis says Turftreet customers were referred to rental stores or other companies if they requested aerating.

"Finally, I spoke to the owners of the corporation and indicated that I thought there was a possibility that we were losing some accounts because we didn't have this peripheral business," says McNalis. "I said I would purchase a machine personally and deal with aeration in the evenings, on weekends, or have my wife walk behind the aerator. As it turned out, my wife hasn't really had to do any aerating. I have been able to handle it all myself evenings and weekends here in the fall. In the summer there wasn't much aerating because of the difficulty in getting decent penetration."

McNalis operates a LESCO, Inc. Aerator-30 spoon-type aerator. McNalis bought his LESCO aerator with both open spoons and closed coring tines. "I get a good core from both systems, but I just get so much better penetration from the open spoon and I get a really good core out of it." He is also impressed with the fact that the front wheels are designed to be removed for working in close quarters. "I feel really comfortable with it," says McNalis. "I am 5-foot, 9-inches and weigh about 165, so I am not big by any stretch of the imagination and I have had the machine out all day Saturday. It is tiring. But people in this business are generally very physically fit. You don't find too many fat lawn sprayers."

McNalis charges \$10 per 1,000 square feet. "I have a minimum charge of \$50 and I give a 10 percent discount to customers I have picked up from the

Turftreet lawn service business." But McNalis is quick to note that there is no kickback to him from the parent company. "That leaves a foul taste in a lot of people's mouths," says McNalis. "The beneficiary of these referrals is the customer. That way I can look at a track record and understand that these people do care about their lawns. Normally, I can pull the square footage from the lawn service business' files without ever having measured the lawn. So it is worth a 10 percent discount."

As a first year goal, McNalis hoped to at least recoup the cost of the aerator, but he has not yet covered his costs. He says it is difficult to get a handle on costs when you have to factor in the wear on his personal van to haul the aerator, the cost of a yellow pages ad, repair parts for the machine, and ramps for the van. "You look at the LESCO aerating machine and you think you can get into the aerating business for \$975, but you have got to carry it around somehow," says McNalis. "Even if you own a lawn service business, you have to adjust your advertising to make sure you are advertising this machine and it is not just sitting around. So there are a lot of hidden costs in there that a lot of people don't realize."

Another thing that has surprised McNalis is the amount of time he has to spend on small turf areas as compared to larger turf areas. "Believe it or not, it takes a long time to do a small lawn, say 4,000 square feet. Because there are so many corners, it is all edges. Most of the work is involved around the edges. There is no problem with these machines on the long straightaways. I spend as much time on a 4,000 square foot lawn as I do on a 10,000 square foot lawn. As you get bigger from there, you start getting into an economy of scale with longer straightaways for the machine and the machine starts

(continued on page 43)

AERATOR SURVEY

How high are your aerator expectations? What features would you build into the ideal aerator? We asked 500 of our readers these and many other questions about aerator construction and utilization.

Home lawn aeration has become a common add-on service of the nation's lawn maintenance professionals, according to a recent survey by ALA.

We mailed out 500 survey forms, and received 120 responses for a 24 percent return rate. This is considered a high response rate, since only five percent of the total number of surveys mailed need to be returned to obtain statistically significant results.

Perhaps the most surprising result of our survey was the number of lawn applicators doing aeration. A spectacular 77 percent of the respondents said they were currently offering aeration.

We asked our readers how they felt about the statement made by industry leaders that "a good piece of aeration equipment doesn't exist." Almost 60 percent of the total respondents agreed. Among readers currently doing aeration, the margin was even higher, with 60 out of 92, or 65 percent, agreeing. One applicator has grown so frustrated over his attempts to find an aerator that suits his needs that he is working on a design of his own. Those readers who said they are thinking of offering an aeration service are more hopeful of finding that ideal piece of equipment — only 43 percent of this

	Very necessary	Nice to have	Not important
On inclines	61	32	7
Around trees	53	36	11
Fit through 36-inch gate	85	12	3
Penetrate hard soil	82	15	3
Easily loaded	66	31	3
Comfortable to operator	53	42	5
Self-propelled	75	21	4

Percent of total responses rating importance of aerator features.

group agreed with the statement.

Under ideal circumstances, most applicators feel that an aerator should be able to handle at least 5,000 square feet per hour. Twenty-one percent of those responding felt that 5,000-10,000 square feet was a reasonable expectation, 35 percent wanted a machine that could cover 10,000-20,000 square feet, and almost 34 percent expected to aerate more than 20,000 square feet per hour.

When asked to number how many 6,000-square-foot lawns a machine should be able to do in a day, most scaled down their expectations. As one respondent noted, "I don't think there will ever be a piece of equipment that can do 20 to 25 lawns a day. Not because the equipment is not there, but because of the manual labor involved

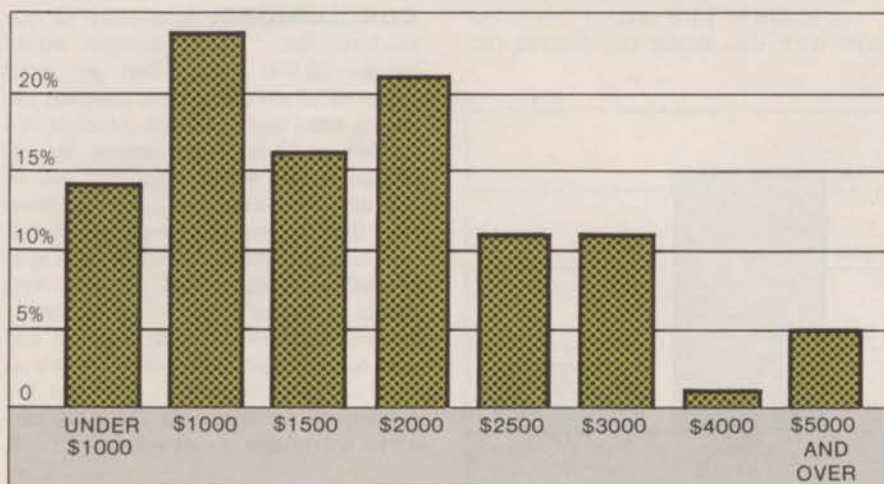
and (because) lawns are not just square pieces of turf." Only 19 percent thought that an aerator should do more than 15 lawns per day, while 28 percent would be happy with a machine that did 8 or fewer lawns. More than half (53 percent) chose from 9 to 15 lawns as a reasonable number for one day's work.

Applicators showed a clear preference for the coring type of tine. Eighty-three percent of those responding to the question felt that the cultivation action should involve either coring tines alone or a combination of coring tines and spoon tines.

The most popular choice on the hole pattern an aerator should leave was "no opinion." Many applicators seem unsure of just how many holes per square foot are required to properly aerate a lawn. From those respondents who felt confident enough to cite a number, the average response was 12 holes per square foot. However, that average comes from responses that varied all the way from one applicator who expected 36 holes every square foot to another who only wanted one hole per square foot.

Our readers had a much better idea of the depth to which they wanted an aerating tine to penetrate. A majority of 62 percent felt cores should be pulled from a depth of between 2.5 to 3.5 inches, with many of those noting that the hole should be "at least" 2.5 inches deep. Twenty-one percent thought holes should be 4 inches or deeper, with the remaining 17 percent feeling that 2 inches was deep enough.

In choosing what they felt was the ideal, our respondents clearly pointed



How much should a good aerator cost?

out their desire for a small, maneuverable machine. "We need a small aerator that will work hard and not fall apart," wrote Kevin Mahannah, Lawnlife Corporation, Salt Lake City, Utah. "Sit down aerators are not practical for the smallest lawns." Another operator noted that "the gang-drawn aerators of golf courses (are) too big for the sloping and confined landscapes of contemporary designers." In keeping with those comments, 85 percent wanted a machine under 500 pounds, and more than half of that number felt it should weigh under 300 pounds.

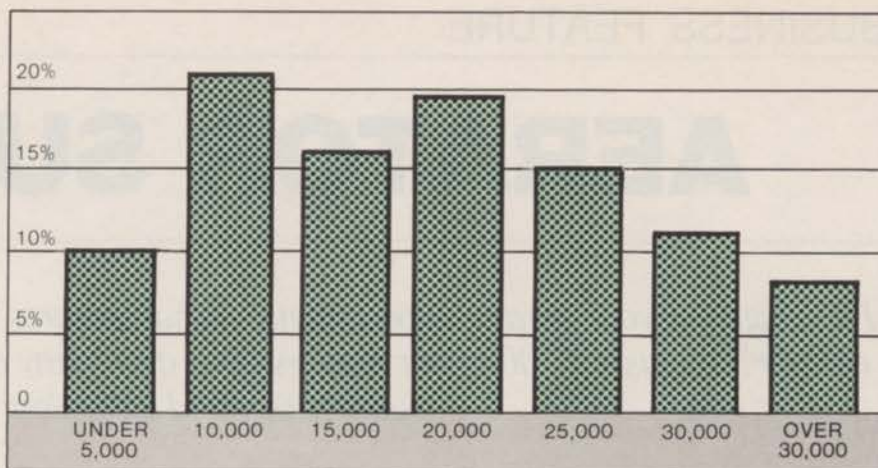
Seventy-five percent thought that a walk-behind aerator was best for their needs, 14 percent preferred a rider, 8 percent chose a pull-behind as best, and the remainder felt that each type had its place in an aeration program.

Most operators demand a high return from their investment in an aerator. Forty-one percent thought that aerator repair costs should amount to no more than 3 percent of the gross income derived from the machine. A further 37 percent believed that the operating expense should be between 4 and 5 percent of gross profits. One applicator qualified his response, writing, "defining your objectives of what you're trying to do by doing aeration is the key. Pricing high and doing less lawns makes a lot of money. Pricing low and doing more lawns helps your lawn care program. Aeration is a good money maker, although it will never replace your main source of income. But it can have a nice place on your profit and loss statement."

Time spent repairing and maintaining equipment seems to be a particular annoyance to many of our readers. When we asked how many hours per hundred a piece of equipment should be down, many wrote "ZERO" and underlined it. One operator, who apparently has had some very bitter experiences with his equipment, wrote that he would be happy if the aerator spent *only* 29 hours out of every one hundred in downtime. Thirty-three percent thought that two hours was reasonable, and 27 percent were willing to put up with three to five hours. Only 12 percent found seven hours or more acceptable.

Our respondents realize that reliability doesn't come cheap. Forty-two percent were willing to pay \$2,000-3,000 for an aerator, and of those 28 percent were willing to pay \$3,000 or more. But almost 13 percent demanded perfection for under \$1,000.

We asked those surveyed to rate what features they considered important on an aerator. It was these features that generated the most comment from the participants. Several went beyond the features we listed and added other characteristics that they wanted in an aerator.



How many square feet per hour do you feel a good aerator should handle?

Operators today are having problems when they move their aerators off flat surfaces. "Residential lawns in the Northeast tend to have many inclines," wrote one applicator from New England. "I'd like to possess an aerator that can handle slopes without endangering the operator or damaging the turf," says Mark Snyder, Northern Greenlawn, Traverse City, Michigan. He also has had problems using his aerator on sloping lawns. "My current machine is fair on a flat unobstructed surface, but few of the lawns we service are on that type of a setting. It seems too top heavy and is very hard to turn around in tight spaces or on a sloped surface. The first lawn I aerated I almost lost the machine in a lake trying to turn it around on a slope by a seawall."

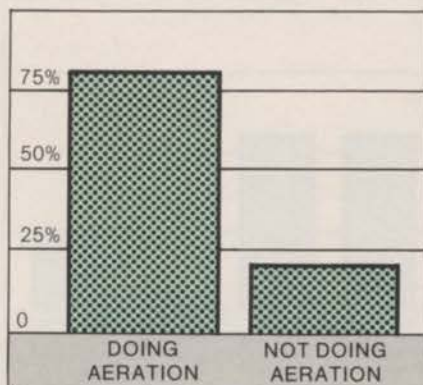
Most applicators want an aerator that will penetrate hard soil. As Jon B. Detrick of Detrick's Evergreen Lawn Service, Dixon, Illinois, notes, "Ideally all homeowners should be good waterers, but we know not all are. Some spend many hundreds of dollars for lawn care but won't spend \$25 per season on watering, even when there are no restrictions. We would like to see better cores in dry or hard soil, as this is the type lawn that needs the process the

most." John Beheut, Eastside Spraying Service, Kirkland, Washington, commented on the problems operators in his area face. "Here on the West Coast the soil type is glacier till - a lot of rock, sand, and silt, but not much clay. Aerifying when the soil is moist is not much problem, but when dry it is not possible to aerify." But another operator pointed out that "no machine to date will aerate concrete! Common sense must be used."

Interestingly enough, most of those surveyed who identified themselves as 'operators' or 'owner-operators' rated 'comfortable to the operator' and 'easily loaded and unloaded' as absolutely necessary features for a machine to have. But those checking off the 'owner' category generally placed comfort and ease of loading as something that was 'nice to have' or 'not important'.

Darrell L. Light, BerryGreen Lawn Care, Danville, Illinois, added a final caution to operators considering an aeration program. "Aerating doesn't give 'right now' results. The customer has to wait until the next year to see any benefits. That can be hard to sell."

CONCLUSIONS. According to our readers, the "good" aerator would handle 20,000 square feet per hour under ideal circumstances. It would use coring tines that penetrate 3 inches in a pattern of 12 holes per square foot. It should weigh 400 pounds or less, fit through a 36-inch gate, and be down only three hours out of every one hundred. Costing about \$2,000, it is a self-propelled, walk-behind model. And most operators want it to be easily loaded, maneuverable on inclines, and able to penetrate hard soils. Now it's up to the manufacturers to convince the lawn care professionals that this machine is available. — Amy Sheldon ■



Does your company currently do aeration?

The author is Circulation Manager of ALA magazine.

working for you rather you working the machine. I believe I can knock out a 4,000-square-foot lawn in about 45 minutes and a 10,000-square-foot lawn would take about 50 minutes!"

Some of McNalis' customers want more cores pulled up per square foot, so he offers them double aeration. "I go over the whole lawn twice for \$15 per 1,000 square feet. That way, they come away happy and I come away happy." He admits he spends more time on the lawn, but he makes up for the time he would normally lose in transportation and loading and unloading the aerator on another job site.

The only problem he has run into is penetration. In dry soil, he only gets 2-inch penetration, which he finds unacceptable. If he can't get at least 2-1/2-inch penetration, McNalis tells the homeowner he will come back after it rains or after they water the lawn. "Whether they realize it or not, in the long run they will appreciate it because they get more benefits out of the aeration process," says McNalis.

When selling aeration, McNalis says you have to first prove its value to the homeowner, but be sure not to oversell

More than any other service profession, it seems as though lawn care operators are always searching for new ways to supplement their incomes. The reason can probably be traced to the seasonal nature of the business, especially for northern businessmen.

its merits. "Many people expect, and we brought it on ourselves, that a spray will fix anything. Therefore, when you are selling aeration, you have to indicate to them that they will not see some kind of miraculous change overnight. It is long-term improvement we are looking for, otherwise we end up with people who have a foul taste in their mouth for lawn service in general."

CONCLUSIONS. Home lawn aerating is becoming more and more popular — both with homeowners and lawn care businessmen. If you don't offer it to your customer, he may do it himself with a rented machine. A number of manufacturers have responded to this growing demand by offering professional-grade aerators to lawn care operators. But as with any other product, remember the phrase *caveat emptor*.

Some of the aerators on the market are very new and are perhaps as yet unproven. If you are interested in offering aerating as an add-on service, it would behoove you to research your purchase — especially since some units are quite expensive. You can see the machines in operation at turf research field days sponsored by universities and at PLCAA regional seminars. The PLCAA is also featuring an outdoor equipment demonstration area at this year's conference and show which has attracted some aerator manufacturers and will surely become a regular feature of future PLCAA conferences. Aerator dealers will also be more than glad to give you a demonstration.

Although aerating is certainly more labor-intensive than lawn spraying, many lawn spray companies are finding that they can make it pay. Once you make the commitment to this service, it is a matter of settling on a treatment price that will cover your expenses and finding a machine that will suit your needs. — *Tim Weidner*

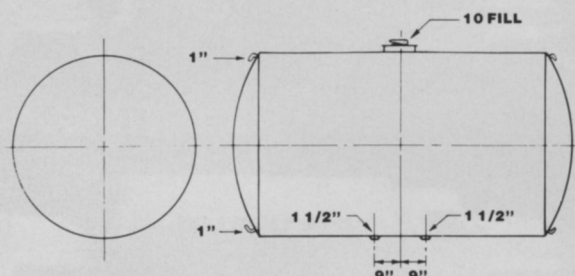
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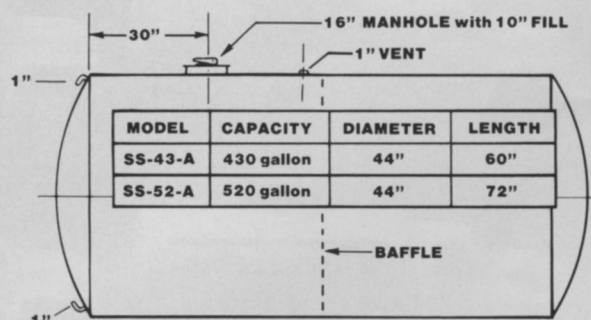
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FALL FERTILIZATION

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To most homeowners, spring is the season for lawn care. Research at Ohio State University, however, is proving that autumn is a better time for effective turf maintenance.

"After a long winter, homeowners are eager to get outside and tackle their lawns," says Anthony J. Koski, a research associate in the Agronomy Department. "By September, they're tired of yardwork. Unfortunately, that's the time when lawn maintenance — especially fertilization — is most beneficial. Homeowners should concentrate their efforts in the fall."

For three years, Koski has studied the effects of spring and fall nitrogen fertilization on turfgrass. Using 15 plots and an underground laboratory to actually watch root development, he monitored and recorded the impact of five nitrogen fertilization programs on 'Baron' Kentucky bluegrass, one of the most prevalent home lawn grasses. The programs differed in two ways: timing and amount.

"The fall fertilization concept has been around since the 1930s," says Koski, "but there really hasn't been enough research data to back up the contention that it's more advantageous than spring fertilization." His results indicate why late-season fertilization is fast becoming the preferred technique with lawn care professionals. Preliminary findings, which were revealed recently at the annual Turfgrass Research Field Day at Ohio State, show that a strong fall program is best for a number of reasons:

- **Better winter color.** Fall fertilization may keep the grass green into mid-December, which is aesthetically pleasing to the homeowner and also better for the plant. A rich, green color indicates that the grass is producing, by photosynthesis, carbohydrates, the main growth nutrient. Since growth declines when temperatures fall below 50



degrees Fahrenheit, the energy is stored in the stems and the leaves, creating a backlog of food.

- **Quicker spring green-up.** The excess energy produced and stored in late autumn, stimulated growth in early spring, with improved color and thickness.

- **Enhanced root growth.** The nitrogen fertilizer applied in the autumn gave the lawn's root system a head start in spring development. The result was a more extensive root system that was accessible to water deeper in the ground. The reason this occurred centers on the characteristics of root development. When temperatures climb above 40 degrees, root growth increases dramatically. Above ground growth needs at least 50-degree temperatures. Therefore, in early spring, roots are not competing

with grass blades for a limited supply of energy.

- **More stress resistant turf.** The increased carbohydrate production and stronger root system helped create a healthier, more stress-tolerant plant. The lawn's ability to recover from disease, insects, drought, and traffic was greatly improved. And consequently, the summer stress period was less damaging.

The critical factor in fall fertilization is timing, Koski found. "For best results, nitrogen should be applied after shoot, or above ground, growth stops. And that's tricky to determine. For central Ohio, it's usually around the second week of October, but a warm autumn could keep grass growing into November."

The only problem Koski experienced was excessive thatch buildup. On fall fertilization plots, thick layers of thatch developed that needed to be removed. Since some critics believe that fall fertilization promotes disease, Koski expected to see snow mold, a disease that takes hold in winter and can kill large areas of lawn. Surprisingly, Koski did not experience disease problems. "The key, I think, to preventing disease and winter kill is the fertilization schedule," says Koski. "If nitrogen is applied too early, it promotes shoot growth, and longer grass, if carried into winter, is more susceptible to disease and low temperature damage."

Koski emphasized that although fall fertilization is important, spring fertilization also should be continued. "Most of the season's nitrogen should be applied in the fall, but a small amount is needed in spring to help maintain color through the summer." — Tom Storey ■

The author is a research writer in the office of Information and Applied Communications, Ohio Cooperative Extension Service, Ohio State University, Columbus, Ohio.

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Weeds are the most ubiquitous pests confronting the professional lawn manager. Of these, crabgrass is clearly the most common summer weed in lawns composed primarily of cool-season grasses. Thus, it is not surprising that there are more herbicides available for controlling crabgrass than for any or all other lawn weeds. Most crabgrass herbicides are designed for preemergence application with respect to crabgrass germination. Materials used in this way are preferred because the unsightly weed never appears to cause injury to the turf. There will be times, however, when a client subscribes for lawn care during early to mid-summer or, for some reason, the preemergence herbicide was not applied or failed to perform as expected

and you are faced with managing a crabgrass infested lawn.

At present, only one class of herbicides can be recommended for postemergence crabgrass control in lawn turf: the methanearsonates. Fortunately, these are quite effective if used properly and are relatively safe, both for the applicator, the lawn, and the environment. However, because arsenic is generally thought of as a highly toxic element, your clients may feel uneasy about having a methanearsonate herbicide used on their lawns. The applicator who understands how these materials work and why they are less toxic than many arsenic compounds may be able to allay customer fears and offset disputes and even costly litigation.

The chemicals of interest in any discussion of arsenic herbicides are named and their properties summarized in Table 1. Arsenic herbicides can be grouped into two general categories: organic and inorganic. Only the organic arsenicals continue to be used for weed control although salts of arsenic acid (calcium, sodium, and lead arsenate) and sodium arsenite were among the very first chemicals ever used as herbicides.

Until a few years ago, arsenate salts were recommended for crabgrass and *Poa annua* control in turf and sodium arsenite was used for complete plant kill prior to turf renovation. These materials were used at high per acre rates of arsenic and are quite toxic to animals (Table 1). The LD₅₀ (quantity of a chemical which in a single dose will kill 50 percent of a population of test animals, usually rats) of inorganic arsenic salts varies between 10 and 100 milligrams per kilogram of animal body weight. By comparison, the LD₅₀ for organic arsenicals is between 700 and 1,800 milligrams per kilogram. This high level of toxicity, together with the heavy application rates required for effective weed control, led to a sharp reduction in their use as herbicides during the 1970s.

By comparison, the organic arsenicals are much less toxic and are herbicidally effective at relatively low rates (Table 1). While 160 to 200 pounds of arsenic are required per acre for effective crabgrass control when using calcium or lead arsenate, the methanearsonates can do the job with less than 2 pounds of arsenic. Arse-



Figure 1. Postemergence crabgrass control plots at Kingston, Rhode Island. Dark plots free of crabgrass received methanearsonate herbicides. (Research of J. Jagschitz)



Figure 2. Scribed in crabgrass infested turf by two applications of DSMA is 1776. (Created by J. Jagschitz)

nate (AsO_4^{3-}) is chemically much like phosphate (PO_4^{3-}) and it competes with phosphate in many metabolic reactions, especially those involving the synthesis of adenosine triphosphate (ATP) and the production of phosphate esters.

These reactions are involved in energy metabolism in both plants and animals. Consequently, arsenate salts are highly toxic to all living organisms which utilize phosphate esters for energy transfer or biosynthetic reactions. This makes arsenate a potentially dangerous substance, which, because it competes with the relatively abundant phosphate, must be used in large quantities to be herbicidally effective. To provide acceptable weed control on fertile land which contains abundant available phosphate, arsenate salts are required at two or three times the rate effective on infertile soils. This toxicity to animals and the high rates required for effective weed control contributed to their decline in use as commercial herbicides.

Sodium arsenite has been used widely to kill all vegetation prior to turf renovation and at very high rates for soil sterilization. Arsenite forms a stable complex with an essential component of two critical oxidation reactions in oxidative respiration. Again, this metabolic pathway occurs in plants and animals, so arsenite is highly toxic to both. This toxicity, arsenite being one of the most toxic chemicals ever used for weed control (Table 1), along with the relatively large application rates required for effective plant kill, resulted in it also being withdrawn as a herbicide in the mid-1970s.

Today the methanearsonates remain as the only arsenic herbicides generally recommended for use on lawn turf and one of these (cacodylic acid) is restricted for complete plant kill prior to lawn renovation. The principal methanearsonates (MAA, MSMA, DSMA) are somewhat unique among arsenic herbicides in that they are truly selective. While they were first used for crabgrass control in turf, DSMA and MSMA currently also are used for selective weed control in cotton and as directed spray herbicides in citrus orchards and on noncropped lands. They are especially effective in the control of such hard-to-kill weeds as Johnson grass and yellow nutsedge (Ross and Lembi, 1985).

In lawn turf, the methanearsonates are effective for crabgrass and yellow nutsedge control after the weeds have emerged and contain several leaves. A repeat application 7 to 14 days following the first is required to control any regrowth or seedlings that may emerge

after the first treatment. Methanearsonates should be applied after most crabgrass has germinated and the plants are clearly visible. These materials have no residual action so any seedlings which appear after spraying will not be controlled. When applied properly, the methanearsonates can be highly effective in controlling crabgrass while causing only temporary discoloration to the lawn grasses (Figures 1 and 2).

Because the methanearsonate herbicides are systemic, that is they translocate from leaves to underground organs (Ashton and Crafts, 1981), they are effective against the perennial nutsedges, especially yellow nutsedge. Few other lawn herbicides will control this weed, but two or more applications of DSMA or MSMA over two growing seasons will eliminate yellow nutsedge from a vigorous lawn.

Questions a homeowner may ask about the metha-

Chemical name	Common name	Trade name*	LD50 mg/kg	Rate lbs. As/A
Arsenic Acid	Calcium arsenate	—	48-100	160-200
Arsenious Acid	Sodium arsenite	—	10-50	220-880
Dimethylarsenic Acid	Cacodylic Acid	Rad-E-Cate	700	1.6-5.5
Methanearsonic Acid	MAA	Daconate	1300	1-2
Monosodium methanearsonate	MSMA	Weed-Hoe	700	0.9-1.8
Disodium methanearsonate	DSMA	Crab-E-Rad	1800	0.8-1.6

*Sample names only, most chemicals marketed under several names.

Table 1. Names and properties of past and present arsenic herbicides.

Carbon-14 Product	MAA Treated*	Control
	counts per minute	
Malic acid	13,700	4,800
Sucrose	1,700	11,600
Malic acid/sucrose	8.1	0.41

*Treated with MAA for 24 hours before exposing to $^{14}\text{CO}_2$ (after Knowles and Benson 1983).

Table 2. Incorporation of Carbon 14 into photosynthetic products of Johnsongrass leaves after exposure to $^{14}\text{CO}_2$ for 10 minutes.

nearsonate herbicides which the lawn care professional should be able to answer include, "How do these arsenic herbicides kill crabgrass without seriously damaging lawn grasses?" "Why are they effective at low rates compared to other arsenic herbicides?" "Why are these arsenic chemicals not toxic to humans or animals?" The answers to these questions are not difficult and can be comprehended by the client if a few basic ideas on plant biology are understood.

Those weeds against which the methanearsonates are most effective are among a group of plants having a specialized photosynthetic CO_2 fixation pathway. Because the very first product of this CO_2 assimilation route is an organic acid containing four carbon atoms, the plants having this pathway are termed C_4 plants. Most plants, which grow best in cooler climates, fix CO_2 into an organic acid containing three carbons and these are called C_3 plants. The basic biology of C_4 weeds and the reasons behind their capacity for growth under mid-summer conditions was discussed in an earlier *ALA* article (Hull, 1982). You may wish to reread that article before continuing with this.

Because most summer weeds are C_4 plants while the cool-season turfgrasses are C_3 plants, it seems reasonable that an inhibitor of the C_4 photosynthetic pathway should be selective in its toxicity to warm-season weeds. It now appears that the methanearsonate herbicides derive their selectivity from the fact that they inhibit a chemical reaction unique to C_4 photosynthesis. The methanearsonates were not developed as herbicides because of their specific inhibition of C_4 photosynthesis. In fact, during the early 1960s, when the organic arsenicals were first released as herbicides, the differences between C_3 and C_4 photosynthesis were not even recognized. Our current understanding of the two photosynthetic pathways now enables us finally to explain the selectivity of these crabgrass herbicides.

This explanation for the selective action of methanearsonate herbicides was recently proposed by Dr. Andrew Benson at the Scripps Institution of Oceanography in LaJolla, California. Benson had earlier been a member of the team working with Dr. Melvin Calvin, who in the 1940s first described the basic biochemical pathway of photosynthetic CO_2 fixation in plants. For this work, Calvin was awarded the Nobel Prize for chemistry in 1961. Much later, Benson noted that marine algae which grow in the nutrient poor waters of the deep ocean are subjected to arsenate levels about equal to the concentration of phosphate (2 ppb). He speculated that for these organisms to obtain adequate phosphate without ex-

periencing arsenic toxicity, some mechanism for excluding or detoxifying arsenate must be operating. Since arsenic can accumulate in some algae to over 100 ppm, exclusion from their cells did not seem to be involved.

In a series of experiments employing the chromatographic separation of organic compounds containing radioactive arsenic-74 introduced to the algal cells as arsenate ($^{74}\text{AsO}_4^{3-}$), Benson found that arsenate was absorbed, reduced, methylated, incorporated into an arsenolipid, and eventually excreted as trimethylarsoniumlactate (TMAL) and cacodylic acid (Herrera-Lasso and Benson, 1982). Methanearsonic acid (MAA) is also known to be released into seawater by some algae. In short, these marine organisms detoxify inorganic arsenate by converting it to nontoxic organic compounds which are discharged to the surrounding water.

Benson found it curious that some of these arsenic detoxification products of marine algae are the same compounds used as herbicides for the control of crabgrass and Johnsongrass. He reasoned that these weeds must contain a vulnerable enzyme which catalyzes a biochemical reaction not required by marine algae. The reactions of C_4 photosynthesis, present in the summer weeds, but lacking in algae, seemed a likely place to begin a search for this vulnerable site. When carbon-14 labeled CO_2 was photosynthetically fixed by Johnsongrass leaves, the first product to contain carbon-14 was the four-carbon acid, malic acid (Knowles and Benson, 1983). A short time later, carbon-14 was found concentrated in the disaccharide, sucrose. When leaves were sprayed with methanearsonate prior to being exposed to $^{14}\text{CO}_2$, the radioactive carbon accumulated in malic acid, but not in sucrose (Table 2).

One major problem confronted by plants when growing at high temperatures (mid-summer conditions) is the low concentration of CO_2 available for photosynthesis. Not only is CO_2 present in the atmosphere in small amounts (about 335 ppm), but as the temperature increases, the CO_2 concentration in the aqueous cell solutions decreases because the solubility of a gas in water decreases with a rise in temperature.

The enzyme responsible for fixing CO_2 in photosynthesis is ribulose biphosphate carboxylase ($\text{RuBP}_{\text{case}}$). The affinity of that enzyme for CO_2 is such that it will function at half its maximum rate when the CO_2 concentration is $10 \mu\text{M}$ (10 micromoles per liter). Water in equilibrium with atmospheric CO_2 will have a dissolved CO_2 concentration of about $12 \mu\text{M}$ at 20 degrees Celsius, but if the temperature increases to 35 degrees C, the CO_2 concentration decreases to $8 \mu\text{M}$.

In practical terms, this means that the enzyme which fixes CO_2 in photosynthesis can never function at better than half its maximum rate, and at high temperatures will operate at less than that. Combine this with the fact that oxygen competes with CO_2 for the same enzyme and at elevated temperatures the dissolved O_2 concentration does not decline as much as does CO_2 (Hall and Keys, 1983), and you have the ingredients for an inefficient photosynthetic system, especially at high temperatures.

It is not surprising that under semitropical climates, where hot temperatures are the norm, some plants have evolved a mechanism for overcoming inefficient photosynthesis. This modification involves the initial fixation of carbon by a different enzyme, phosphoenolpyruvate carboxylase (PEP_{case}), which uses bicarbonate (HCO_3^-) and not CO_2 as its substrate (Figure 5). The product of this enzyme, a four-carbon acid, is transported into the interior of the leaf, where in special bundle sheath cells, the four-carbon acid is decarboxylated releasing CO_2 , which accumulates in high concentration and is refixed efficiently by $\text{RuBP}_{\text{case}}$.

When the four-carbon atom is malic acid, the enzyme responsible for its oxidation to release CO_2 is malic enzyme. Thus, in many plants exhibiting C_4 photosynthesis, malic enzyme is essential for the flow of carbon from C_4 -acids to $\text{RuBP}_{\text{case}}$ and on to C_3 -compounds which ultimately are converted to sucrose. If malic enzyme is inhibited, malic acid will accumulate and sucrose will not be synthesized, which is exactly what Knowles and Benson observed (Table 2).

Before going any further, I should explain why a carbon fixing enzyme which uses HCO_3^- has an advantage over one using CO_2 . When atmospheric CO_2 is dissolved in the cell sap of the outer leaf mesophyll cells, it is hydrated to form carbonic acid which spontaneously decomposes to HCO_3^- and H^+ . At pH 8, which is the pH of chloroplast sap in the light, the equilibrium of CO_2 and HCO_3^- is such that while the CO_2 concentration is $10 \mu\text{M}$ or less, the HCO_3^- concentration is 1,000 μM , or 100 times that of CO_2 . At pH 8, the enzyme PEP_{case} operates at half its maximum rate when HCO_3^- is $100 \mu\text{M}$ (O'Leary, 1982).

Thus, under the conditions in a photosynthesizing cell in the light, $\text{RuBP}_{\text{case}}$ is seriously inhibited due to a lack of substrate CO_2 , while PEP_{case} can function at its maximum rate because of the abundance of its substrate HCO_3^- . In C_4 photosynthesis, the HCO_3^- fixed as malic acid is transported to the bundle sheath cells where it is released as CO_2 through malic enzyme.

(continued on page 83)

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THE LATEST IN MOWERS

By all reports from leading mowing equipment manufacturers, 1986 should be a banner year for new commercial mowing equipment.

As 1985 rapidly fades into 1986, we decided to take a peek at new commercial mowing equipment that will hit the market in the next few months. A few manufacturers we spoke with are so pleased with the success of their current products that they really have no new product lines planned for 1986, but several others are in the process of getting machines off the drawing board and into the field. The following comments from some key mower manufacturers should give you some new entries for your mower shopping list.

WALKER MANUFACTURING COMPANY "We will be introducing some improvements on our one basic machine. It is hydrostatic with a front-mounted deck. The whole front end of the machine is going to be heavier. It's not that we have had a problem with our existing design, we are doing it primarily to improve hillside traction.

With a heavier deck and counter-weight springs, we are able to load the drive wheels and shift the center of gravity in a more favorable position on the machine.

We have proven by our tests that it is going to make the whole machine handle better on hillsides. We are killing two birds with one stone. Rather than just mount a big counter-weight on the front of the machine, we built it into the structure of the deck. The commercial people are going to like the heavier deck. We are also putting bigger wheels on the front. The gauge wheels are going to be 8-inch instead of 6-inch. The whole machine is going to have a little more rugged construction. In some ways it is almost a psychological thing because our machine has been standing up well commercially, but the construction will look more rugged.

We have a tilt-up body on our machine for easy maintenance, and we have had just a scissor linkage in there

to hold that body in the 'up' position. Next year we will be using gas springs, similar to those used on hatchback automobiles. We will use that type of cylinder to assist and improve safety when you tilt up the body.

We're getting good acceptance in the commercial market. It is taking awhile to develop a reputation. We feel our machine represents a next generation of trim mower. So many people today are using commercial walk-behinds for the trim function. Our rider machine will fit into all the tighter areas a walk-behind can, yet offers the quickness of a hydrostatic rider." — *Bob Walker, President, Walker Manufacturing Company, Fort Collins, Colorado*

CUSHMAN/RYAN TURF EQUIPMENT "Under the Cushman product name, with our out-front rotaries, we again will be offering two basic power units — one gasoline and one diesel in either three- or four-wheel configuration. We increased our horsepower this past year on our gasoline unit to 22 horsepower. The diesel will remain the same at 17 horsepower.

We're changing the paint scheme a little. We are reversing the colors. The deck used to be a light green with the belt covers dark green and we are reversing that.

We will be offering a two-year warranty new for 1986. We are taking a more aggressive approach from a marketing standpoint in regards to pricing. They are programs we are offering to our distributors to give them more flexibility in pricing. We are going to emphasize the lawn care market heavily because we feel we have a very attractive mower as far as performance and price to that market." — *Dan Hedglin, Sales Manager, Cushman/Ryan Turf Equipment, Lincoln, Nebraska*

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"All product lines have a number of improvements for 1985-86 season. Most of the improvements are to our



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ALA-115

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Betasan 4.6-G + Fertilizer	\$.90/cwt.
Betasan 7-G	\$1.25/cwt.
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2. Fill in your name, signature and address on reverse side and mail with copies of your dated supplier invoices clearly showing quantities by formulation of Betasan purchased from an authorized distributor or dealer to Crabgrass Cleanup Rebate, P.O. Box 768, Berlin, CT 06038. Only one rebate claim can be honored per qualifying purchase.
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commercial products as opposed to the more consumer products. In addition to the product improvements and changes, we have a number of extensions of present product lines. Our four major product lines are two-wheel tractors, four-wheel tractors, walk-behind single purpose commercial mowers, and out-front commercial mowers. The improvements are a result of our continued work with our dealer advisory council and with the dealer network as a whole.

On our two-wheel, 5000 Series convertible tractors, we've added a 10 horsepower as a standard product in the line. We now have 8, 10, and 12 horsepower engines. A number of these changes have come about as result of suggestions from dealers as well as end-users.

The intermediate walk-behind Pro-Line mowers were a new addition to our product line about three or four years ago. We've increased the ground-speed, established a wider variety of groundspeeds for the units. Most importantly, we've added a 36-inch mower to the line. This 36-inch is the only mower on the market that is a multi-mode type of mower, meaning it can either be a rear-discharge, or a side-discharge, or it can be used with a grass collection system. Just by changing a couple baffles, the customer has three different mowers.

Another addition to the walk-behind Pro-Line is a new grass-catcher, a dual mode grass catcher. It can either serve as a dump style catcher that can be dumped while the unit is in operation or a catcher that can be lifted off and dumped into some kind of grass collection container.

Our 8000 Series four-wheel riding tractors have probably the most number of changes. The most dramatic is an improved turning radius, a much tighter turning radius to make the tractor more maneuverable. The turning radius on the new machines is now 26-1/2-inches.

As a general rule across all the mowers, we have quick removal belt covers so that the commercial operator can remove the belt cover in the field very quickly just by unscrewing a wing nut.

We have introduced an eight-speed version of the three-wheel Pro Master line. We introduced a snowblower attachment and winter cab. We still offer the 50- and 60-inch mower decks. This year involved the largest number of changes in Gravely's history. Our expanded engineering department has allowed us to move up the timetable on a number of changes and improvements



Pro Master 50 with grass catcher

that have been suggested. Probably the fastest growing market for us is the commercial cutter/landscape market. That is a very strong market for our dealers and one that is growing quite well and one that we plan to remain firmly planted in.

The equipment, particularly with these changes, is going to hold up quite well so that we have offered a two-year warrantee as standard for the commercial applications for these four product lines." — *Lee Bouldin, Marketing Service Manager, Gravely International, Clemmons, North Carolina*

MIDDLESWORTH, INC. "We are pushing for introduction of our new gas-powered 'L' Series next spring. The new L Series features a 18 horsepower, 70- or 48-inch cut rotary mower or a one-piece 54-inch deck. It has a zero turning radius. The difference in this machine from the ones we have made in the past is it is a rear-

wheel drive, low profile machine so it will handle the hills and slopes a lot better. You get weight transfer to the rear wheels as you start up the hill. Since it is low-profile it still takes side hills better.

Our other machine handles hills better than most machines because we have a wide axle option available which gives it a lot more stability. The fact that we can put flail mowers on it will be attractive to anyone who is really interested in safety. A lot of our flail mowers have gone to schools or anywhere safety is a main concern." — *Tom Middlesworth, President and Designer, Middlesworth Engineering and Manufacturing, Inc., Greentown, Indiana*

EXMARK MANUFACTURING COMPANY, INC. "We have not introduced any new revolutionary machines, but we have made a number of improvements on our existing product lines. We have a new easy-on, easy-off grass catcher. There is a new blade engagement feature on our mower that greatly increases the life of belts. We're using a new 12-1/2 horsepower Kawasaki engine as an option. We are also offering a new drive that has five forward speeds and a reverse. These are on our intermediate size mowers. We continue to offer 32-, 36-, and 48-inch deck sizes. We have tailored a new program to allow dealers to be more flexible in their pricing." — *Bob Martin, Advertising Manager, Exmark Manufacturing Company, Inc., Beatrice, Nebraska*



Middlesworth "L" Series

DEERE AND COMPANY "During the month of September we brought in more than 4,500 dealers and their sales people to introduce them to 52 new products. More than half of them have commercial applications. Back in 1983, John Deere introduced its first mowing machine developed for the professional groundskeeper — the front-mower. We had two gasoline-powered models, the F910 and the F930. For 1986 we are introducing two diesel versions of the front-mower, a 17 horsepower model F915 and a 22 horsepower model F935. Although we didn't invent the concept of the front mower, we certainly made a lot of improvements on it. We have made differential lock standard on all of them. We also built in a cruise control so if you have to mow a very large area you can set the speed just like on a car. If you touch the brake or accelerator, it takes it off cruise.

In the compact utility tractor area, in the 20 to 40 horsepower range, up until now all of them have been manufactured outside of North America. John Deere introduced three new compact models — 655, a 20 horsepower model 755, and 24 horsepower model 855. They all have three cylinder, water-cooled diesel engines. They also have a little different design.

Traditionally, when a company is



John Deere F910 with dethatcher attachment


going to manufacture a tractor, they basically take the transmission case and just connect it to the engine and build the tractor around that. Deere decided to go back and re-think tractor design for this category. They decided to basically put the engine and the transmission on a unitized frame and then build the tractor around the frame. The unitized frame has two channels with a

space in between. That allows the gear box on top of the mower deck to actually fit up inside the frame when the mid-mounted mower is raised. It gives the tractor tremendous ground clearance under the mower.

With these new compact tractors, you could put a mid-mounted mower on it, have a brush cutter on the back, and a front loader on the front. You can

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raise the mid-mounted mower up into the frame, lock it in place, and you don't have to take the mower off and on if you want to use the front loader, for example.

We also have new commercial attachments for our front mowers. One of them is a 76-inch swept spindle maintenance mower. One of the spindles is sort of swept to the side, so you get an extremely tight trimming radius around trees. We also introduced a 47-inch, two-stage snowblower for the front mowers and a new material collection system for the front mowers. It is rear-mounted, three-bag system. It has an auxiliary six horsepower gasoline engine and five-blade blower fan — we call it the "Power Pack." We also introduced some rotary brooms for the front mowers and some weather enclosures.

We introduced a thatcher attachment that can be attached to the mower deck of the front mower. There are spring-steel tines that kick out the thatch every time you mow to keep thatch from building up.

In 1983 we had the biggest commercial product introduction in the company's history. We introduced 25 new products. Here in 1985 we just introduced 52. The indication is you ain't seen nothing yet. Deere has plans to

maintain that base through the rest of '80s. About 1979-1980, John Deere decided the commercial market was a good avenue of opportunity. We know groundskeeping equipment and we have the expertise to develop equipment for the pros that will give them some unique advantages." — *Bob Tracinski, Consumer Information Specialist, Deere and Company, Moline, Illinois*



Deutz-Allis 611 Special with grass catcher attachment

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and 26 PTO horsepower. The fully-synchronized transmission has 12 forward and three reverse speeds to handle a wide range of jobs. Speeds range from 0.4 to 10.7 mph on agricultural tires; 0.3 to 9.5 mph on turf tires.

Klockner-Humboldt-Deutz (KHD) that had formerly sold agricultural equipment down to about 30 horsepower, merged with Allis Chalmers who markets everything from lawn and garden equipment up through the largest farm tractors. The two merged product lines, sales forces, and the dealer network in June of this year. We are all owned by one company now called Klockner-Humboldt-Deutz from Cologne, West Germany. We hope to become the third largest farm equipment producer in the world and along with that goes our lawn and garden equipment.

The color of the equipment has been changed to the new corporate color which is spring green. The fact that we merged had no major effect on the development of the line itself, in that the line had been carried by Allis Chalmers. Since Deutz did not have a line before they merged with us, we just maintained the line we had." — *Jeff Horwath, Senior Product Manager, Deutz-Allis Corporation, Klockner-Humboldt-Deutz, Milwaukee, Wisconsin*

SENSATION POWER EQUIPMENT "The units from Sensation will be five horsepower, self-propelled, which is something Sensation has not had in the past. We have had five horsepower push units. They will be in both exempt and compliance versions as far as the standards are concerned.

We have brought back one model without an IC engine, the 21-inch model 56035. It is for government bids and the customer who does not need the heavy-duty commercial IC engines. It is a standard Briggs and Stratton engine." — *Dean Ziezenbein, Product Manager, Sensation Power Equipment Division, Plymouth, Wisconsin*

MAGIC CIRCLE CORP. "We started with the 5018 Magnum and we had some commercial users who wanted just a little bit more. So we increased the engine size and the cutting width. The standard model has a 50-inch deck and an 18 horsepower Briggs and Stratton engine. The Sidewinder has a 60-inch cut and a 24 horsepower Onan engine. We have moved probably about 15 of them (the Sidewinders) so far.

It has one thing unique to the industry. It has a gear box that will convert a horizontal shaft to a vertical. This will allow for attachments to be driven off



Dixie Chopper Sidewinder 6024

that.

We chose knobby RV tires on the drive wheels for operator comfort. If you have ever been on a three-wheeler, those type of tires give a really cushy ride. When we designed the 5018 Magnum, there were two things we really took a look at, knowing that the commercial user is going to be on these mowers eight hours a day, six days a week. We took a long look at operator comfort. That is the reason for the tires. It also has a seat that most farm tractor companies use for operator comfort.

The other thing is ease of maintenance. You can strip this lawn mower down and have the frame standing up

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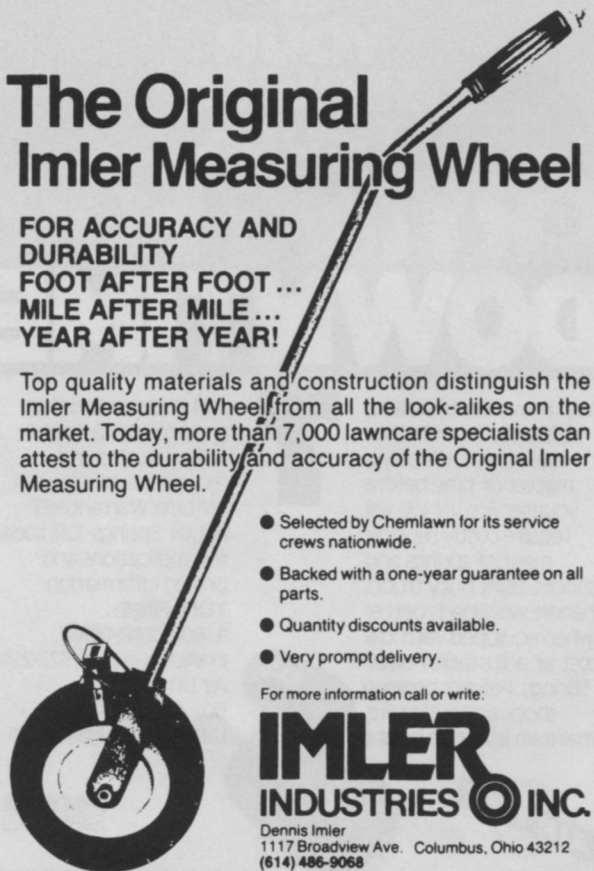
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against the wall in about 30 minutes. It is that easy to maintain." — *Jean Evans, Co-owner, Magic Circle Corporation, Coatesville, Indiana*

EXCEL INDUSTRIES, INC.

"Most of our new machines came out last year. At that time we came out with two new liquid-cooled tractors. Two were diesel and one had a gas engine. We do have a relatively new four-wheeled tractor called the 251 which has a 51-inch mower. It has a 18 horsepower Briggs and Stratton engine and an integrated vacuum system that we call a 'Back Pack.' Everything has worked out well for us, so we really don't have any changes." — *Mark Foree, Sales Manager, Excel Industries, Inc., Hesston, Kansas*

F.D. KEES MANUFACTURING

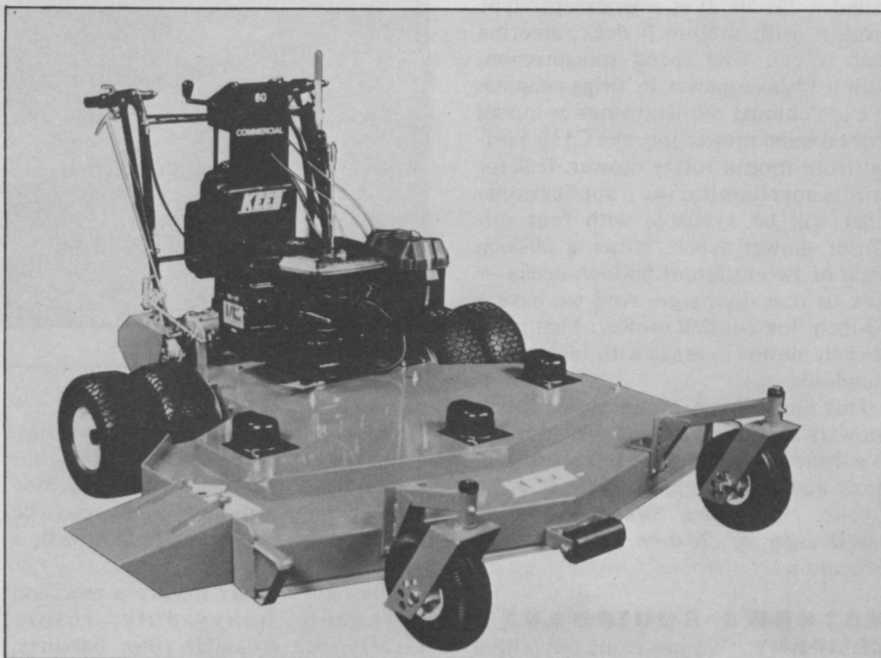
"Our 21-inch self-propelled walk-behind mower for 1986 will have a cast aluminum-magesium deck. It is something new on the market and they are lighter and stronger than the straight aluminum. Our 32-inch mower will be offered in 8 and 11 horsepower IC Briggs and Stratton or 11 horsepower Honda versions. We will probably also offer a 12 horsepower Kawasaki engine.

The 32-inch will be offered with smaller front caster wheels. The

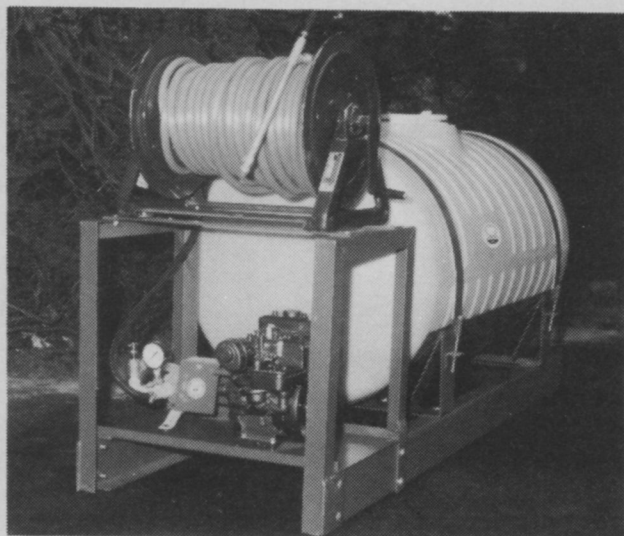
32-inch mower is a smaller unit.

The 36-inch will be offered with the same engine options as the 32-inch mower. The 48-inch will have a sweeping deck which comes to somewhat of a point in front. The 48-inch will also

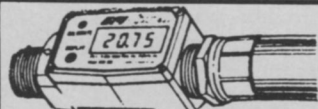
be offered with a 14 horsepower Briggs IC engine with an electric start. Standard on the 36- and 48-inch will be pneumatic front caster tires. The 60-inch self-propelled will have dual rear tires on the drive wheels."



Kees 60-inch commercial walk-behind mower



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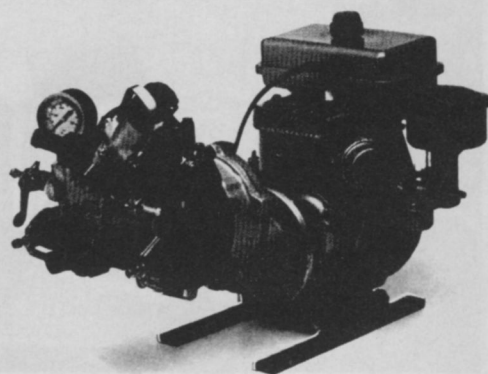


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—George Schaefer Sr., Chairman of the Board, CEO, F.D. Kees Manufacturing, Beatrice, Nebraska

JACOBSEN/DIVISION OF TEXTRON, INC. "We have a new 50-inch commercial rider coming out called a TR-50. It is a landscaper-type product with a 50-inch deck, steering rear wheel, five speed transmission, with a 15 horsepower IC Briggs engine. We are coming out with a newer model front engine mower too, the C118 Turfcut front-mount rotary mower. It is for landscaper/contractor applications. That will be available with four different mower types, either a 50-inch deck or two different 60-inch decks — side or rear discharge. And we have a 50-inch fine-cut flail mower. That is especially useful in areas with high safety standards.

Our line of walk-behind large rotary mowers have had some improvements. We have beefed-up some of the sections and put in larger brakes." —Jim Byrnes, Advertising Manager, Jacobsen/Division of Textron, Inc., Racine, Wisconsin

MATHEWS EQUIPMENT COMPANY "We just came out with a new line of flail mowers, available in a 60-, 72-, and a 88-inch size. They are



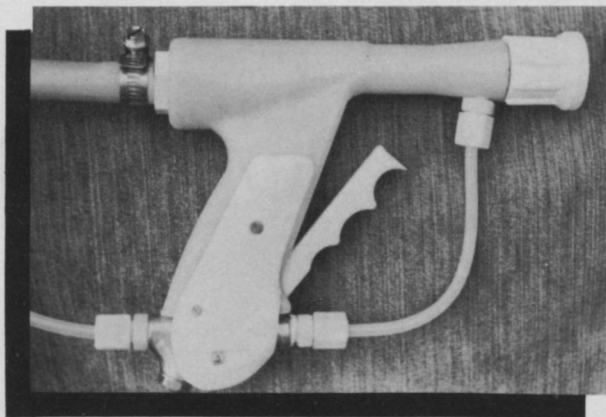
Flailmaster mower

called our Flail Master mower series. They are good for not only municipalities and park districts, but also roadside mowing applications. They can be mounted to any larger tractor with a three-point hitch.

The flail mowers feature a precision balanced heavy-duty rotor, 1-15/16-inch greasable rotor bearings, and patented spring-loaded "quick change" knives. There is also a single

"C" section belt drive with spring-tensioned, self-adjust idler pulley, full span tubular steel gauge roller, 60 horsepower gearbox, 540 RPM PTO, and a category 1 three-point hitch. Cutting heights are easily adjusted from 0- to 6-inches. An optional 360-degree rear mount caster wheel kit and thatching blade kit are available." —Phil Farr, Sales Manager, Mathews Equipment Company, Crystal Lake, Illinois

INJECTION GUN SYSTEM



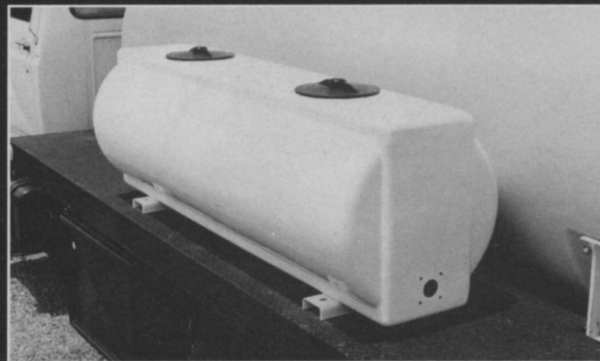
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WHAT'S NEW IN SPRAYERS

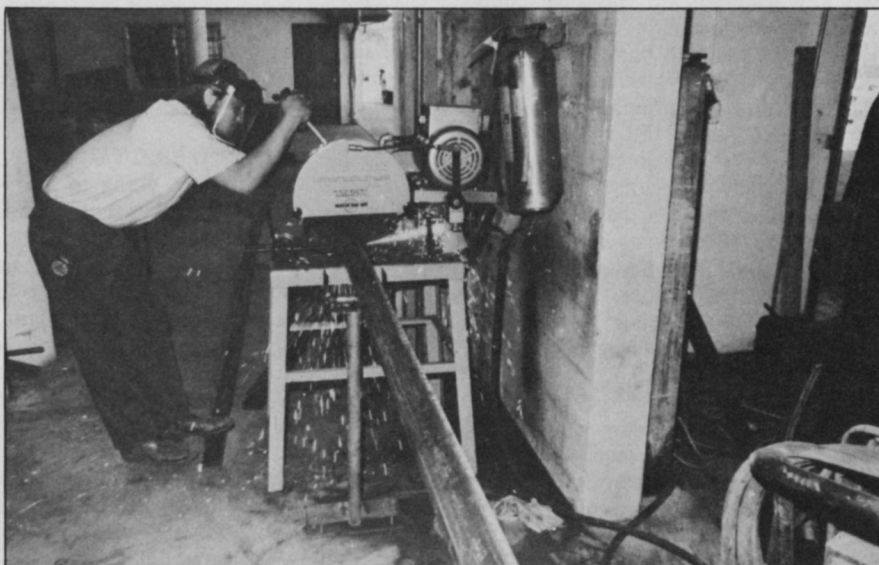
The coming year promises a few surprises in spray rig equipment that may make you reassess your method of applying lawn care chemicals.

Somebody once said, "The more things change, the more they stay the same." That expression may apply to a great many things, but certainly not the lawn care industry. The industry is still relatively young and changes with each passing year.

This coming year will see some changes in spray rig equipment. Like the mowing equipment manufacturers we also spoke with elsewhere in this issue, some spray equipment manufacturers really have nothing new for 1986, but still others will offer us some intriguing innovations. So hang onto your checkbooks, the new sprayers are coming!

STRONG ENTERPRISES "One of the things we are in the process of developing right now is a super long-life, low-volume unit of aluminum, fiberglass, and stainless steel construction mounted on a 1-ton truck. That will probably be available in December, January at the latest. It is also going to have a DC-drive motor, 36-volt, and you will be able to dial in how many gallons per minute you want with a variable speed switch.

In other words, you can spray 1



Worker cuts frame assembly at Strong Enterprises, Inc., Miami, Florida.

pedo tanks of 80 gallons each.

The trend is continuing of people trying to down-size. They are trying to go to lower volume, which means lower water capacity. There is less money in insurance, less maintenance, and less expenditures in vehicles. The

that is going to last for 20 years with aluminum, stainless steel, and fiberglass. We feel that buying one of these complete units is a capital investment and the people who buy it ought to be able to count on having it for a long period of time.

Sometime in the near future we are also going to come out with our own fiberglass tank line. We are in the process of building a new plant right now. We feel there is no competition in the market for fiberglass tanks. We feel the tanks on the market right now are overpriced. No one in the market should pay more than \$2 a gallon for a fiberglass tank.

We are also the only company in the United States supplying replacement parts at wholesale prices direct to lawn care companies. We have the parts in supply, so we felt that it would increase revenues to sell them direct. We are in the process of making a catalog that will be available next year. In the catalog, we are not only going to include

"The trend is continuing of people trying to down-size. They are trying to go to lower volume, which means lower water capacity. There is less money in insurance, less maintenance, and less expenditures in vehicles." — "Skip" Strong, Strong Enterprises, Inc., Miami, Florida

gallon a minute to a maximum of 10 gallons a minute. It will have a digital flow meter. At every lawn the applicator goes to, he can speed up or slow down the DC motor to whatever output he wants. It will have a capacity of 500 gallons with options of two tor-

whole package is just cheaper.

A lot of people building the larger lawn care units are building the bodies out of wood or mild steel. You have a life on the wood of say, five years, and a life on the mild steel of say, seven to 10 years. We're trying to build a unit

pumps, hose reels, etc., we are also going to explain how to repair everything. It will also be a service reference." — J.H. "Skip" Strong, President, Strong Enterprises, Inc., Miami, Florida

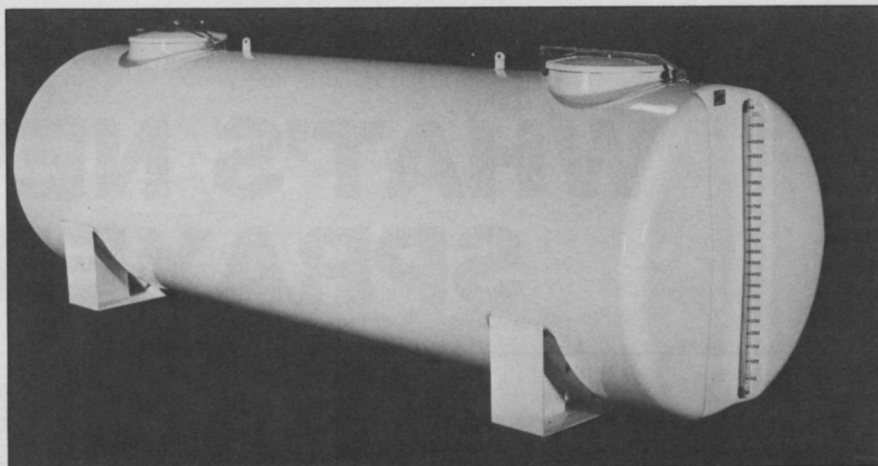
PERMA-GREEN SUPREME

"One of the things we are working with right now is a truck that has both liquid and granular capabilities. One thing that has been lacking in a lot of spray equipment is that with the need to handle some sort of granular from time to time during the season, most trucks have not been set up with the proper containment and locking mechanisms to keep granular material and equipment secure.

Everything is recessed. It has more of a seamless design. You can hardly see any fasteners on this new equipment. It doesn't look like somebody took a flatbed and threw everything onto it, which is a typical look of a lot of these sprayers. On mine, we spent a lot of effort to recess the spreaders into little compartments so they form into the line of the truck. Everything lines up with the outside of the cab, which is unusual because most manufacturers will extend the flat beds out past the cab itself by 6 or 8 inches.

We are also getting into 3/4-ton truck set-ups that will appeal to larger lawn care companies that have a lot of customers and very concentrated routes that require a two-man truck. We can take a 3/4-ton truck and do the same work that a ChemLawn tanker will do. In other words, 300,000 square feet with low volume. That unit will be introduced in Tampa at the PLCAA conference. This one also has granular storage capability.

To help automate the fill process, we will introduce a mechanism to automatically sense the level in the tanks electronically. As the tank fills and reaches the capacity set for it, it can automatically shut the fill process down so there will be no overspill. The operator can go about some other activity



Tuflex 1200C fiberglass tank

rather than standing around watching the tank fill." — Tom Jessen, President, Perma-Green Supreme, Merrillville, Indiana

TUFLEX MANUFACTURING COMPANY

"We are going to introduce our model 0100CL at the PLCAA conference in Tampa for the first time. Unfortunately, we are not going to have them done in time for the show, but we have two other tank designs. We have a model 0600PC that is a more square design of a 600 gallon tank as compared to our model 0600U. It has squarer lines and a greater display area for customer sign boards.

We are also bringing out a 150 gallon tank before the end of the season that mounts forward of the wheel wells, directly behind the cab, in the new mid-sized pickups. It will be along the same concept as the 0200PC and 0300PC; it will be called the 0150PC. These are all seamless fiberglass.

Something on our project list for 1986 are drawings we have just completed on a line of truck storage boxes for under-body storage and on-deck storage. We are trying to design them to be weather-resistant boxes. So

when they put them underneath a bed and want to store materials inside, they will not get wet and filthy. Quite a few major companies are presently buying boxes that just don't hold up. They are not doing the job and that is why we have been contacted. There will be two sizes to start with, but I must stress that this design is not in production yet. The basic concept has been accepted, now we just have to move ahead in finalizing its design.

We are increasing our selection of product designs. We are getting into some new basic shapes. We have been known for a particular shape for so long that we are getting into some newer shapes and accessories — like these boxes. Storage bins and dry hoppers for bulk storage of dry materials are areas we are heading toward." — Tom Sayward, Vice President, Tuflex Manufacturing Company, Pompano Beach, Florida

WANNER ENGINEERING, INC.

"We are going to come out with two new diaphragm pump models. We are going to have a D3, 1 to 3 gpm pump, capable of pressures to 1,000 psi and a D40, 40 gpm pump, capable of pressures up to 1,500 psi. These models will be introduced after the first of year, but will be on display at the PLCAA show.

There is a need for spraying at higher volume for taller trees with the larger pumps. We do a substantial amount of business in the oil fields as well. We have lawn care people who already have orders in-house waiting for this pump." — William Wanner, Jr., President, Wanner Engineering, Inc., Minneapolis, Minnesota

GREEN PRO COOPERATIVE SERVICES

"The newest item we have is the high pressure meter which is capable of reading pressures up to 800 psi. That would be more applicable for people doing tree and shrub spraying. We also will have two new meters next year. One will be low volume,



Perma-Green Supreme GL3001 spray rig

which will register volumes below 3 gallons per minute. The other one will be a large volume meter for transferring bulk materials. It will be a 2-inch meter and will be able to handle volumes of up to 180 gallons per minute.

We will be working on two new diaphragm pumping systems and a centrifugal pump this winter. These will be available as platform sprayers and as complete units with a tank. We will probably be offering at least four different tank sizes — 150 through 400 gallon.

We are working on a larger unit that will be shipped as a complete spray package to be bolted on a flatbed truck. It will consist of two pumping systems and three tanks. The tanks are casket tanks which are poly rectangular tanks placed in a row so the whole thing looks like a box. They will be able to draw off one of the tanks with one of the pumping systems as a totally isolated unit for say, weed control. This whole unit will be set up so they can just plop it right on a truck bed. All the pipes will be contained underneath and have a nice finished look. That is on the drawing board for this winter.

We are working with a lease company now, so our spray units will be available on a lease basis. You put two payments down and you can buy the unit at the

end of the lease term for \$1. The terms of the lease are anywhere between one and three years, generally." — *Richard Hawkes, Vice President/Sales, Green Pro Cooperative Services, Hempstead, New York*

GRAHAM LAWN CARE EQUIPMENT CORP.

"We do custom build-

the low volume capability built into them." — *Max Graham, President, Graham Lawn Care Equipment Corp., Douglasville, Georgia*

PROFESSIONAL TURF EQUIPMENT "We anticipate models with or without beds. We will also develop a rinse water recovery system. Improve-

"We do custom building, but we are getting more orders for multiple tank units — two and three compartment units. People who were using a single tank may be going to two and people using two compartment tanks may be going to three compartment tanks. It is just more versatile." — Max Graham, President, Graham Lawn Care Equipment

ing, but we are getting more orders for multiple tank units — two and three compartment units. People who were using a single tank may be going to two and people using two compartment tanks may be going to three compartment tanks. It is just more versatile. A lot of them are using this rather than an injection system, which up to this point really hasn't worked out that well for most companies. Most of the units with two or more compartments will have

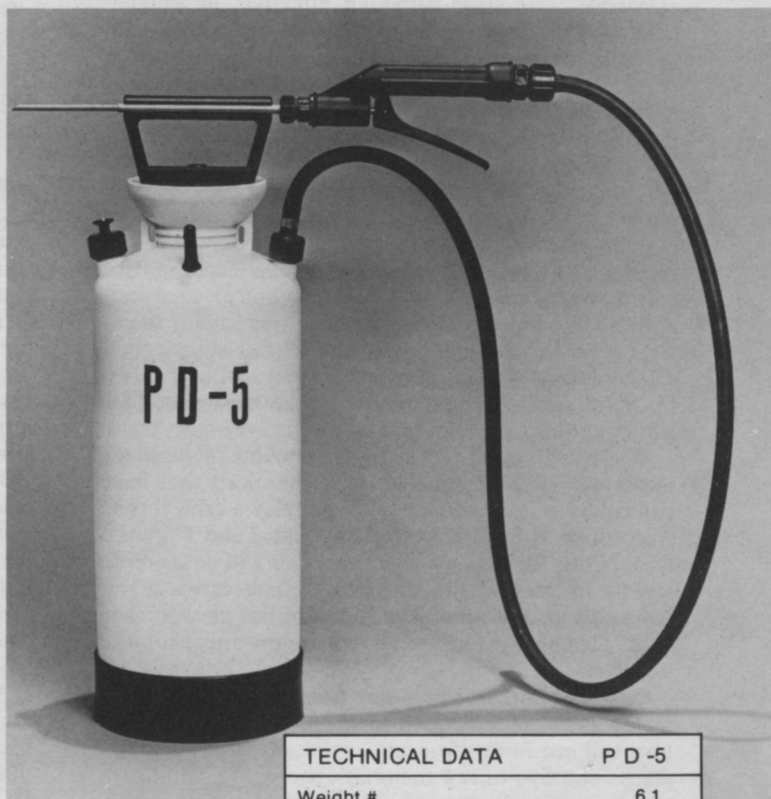
ments overall in our small rigs will include what we call an 'Increaser.' It reduces the RPM of the engine by about 40 percent. This gives better fuel economy and less wear and tear on the engine. It does away with belt drives and the Increaser comes directly off the drive shaft. It is not a PTO; it is between the PTO and the pump. It has been in the field for a year." — *Steve Derrick, President, Professional Turf Equipment Company, Normal, Illinois*

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The tank is hard polyethylene treated with UV inhibitor and tested to over 800 psi. An incorporated pump allows the tank to be pressurized without external power. With the addition of a tire-type valve, the PD-5 can be pressurized with an air hose and a pressure relief valve prevents over pressurizing and serves to release pressure prior to opening.

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CHEMICALS FOR THE NEW YEAR

As winter sets in and there's a little more time on your hands, it's time to start shopping around for turf chemicals for the 1986 season. Lawn chemical manufacturers and formulators have a diverse selection for you to choose from, and they continue to research new products that will make your job easier and safer.

The search is on — perhaps that should read *ongoing* — for turf chemical products that do a better job and are environmentally safe. If we pull out the lawn care industry crystal ball, what can we expect to see in turf chemicals in the years ahead? A tendency toward dry materials for one thing, according to many turf chemical manufacturers and formulators.

"There is a trend toward wanting to use more dry, spreadable materials to meet customer needs," says Paul Mengle, Marketing Manager for Lebanon Chemical Corporation, Lebanon, Pennsylvania. "They're not as visible," he says. Although effective, he emphasizes, liquid materials tend to have odors and drift potential more objectionable to homeowners than dry chemicals. Consequently, lawn applicators aren't as suspect to environmental hazards when dry formulations are used.

Public chemophobia and environmentalists' attacks on pesticides have certainly heightened interest in chemical safety; however, that has always been a concern of chemical manufacturers, says Mengle. Nonetheless, as a result of increasing public fear, the lawn care industry may see the development of chemicals with higher concentrations of active ingredient, therefore requiring the use of lower rates per square foot. This is a trend that's occurring in the agricultural industry right now, Mengle notes. He anticipates it may carry over into the lawn care field.

While low-volume spraying will become increasingly important in the green industry, chemicals that have controlled release sources will also play a critical role. According to Sandra Nelson of Liqui-Land Corporation, Niles, Michigan, these chemicals will tie up more rapidly in the soil and not release their active ingredients all at one time. The industry has already seen this development with nitrogen-encapsulated fertilizers.

Cost is another key issue facing chemical manufacturers in the '80s. And as a result, lawn care operators will see fewer "me-too" products in the marketplace. The cost of raw materials, packaging, and distribution makes it too expensive for chemical manufacturers to duplicate products. "A lot of companies, like ourselves, would hesitate to bring on a 'me-too' chemical, whereas four years ago we might have been able to do so," says George Jones, Director of Communications for Nor-Am Chemical Company, Wilmi-

ington, Delaware. Even though the lawn care business is on the rise, he notes, it's more advantageous to carve a new niche in the marketplace rather than flood an industry segment that's already saturated with similar products.

In the future, Jones sees the development of "more ease of application" chemicals. "More time-saving devices," he says. "Chemicals that perhaps work faster, give faster action." He also foresees a trend toward total treatment programs, which would emphasize combination formulations such as weed-and-feed products rather than individual chemicals.

Looking at the immediate future, what new concepts have already been incorporated into the 1986 line-up of lawn care chemicals? *American Lawn Applicator* contacted a number of turf chemical manufacturers and formulators to hear about their New Year product offerings. Here's what we found out:

DOW CHEMICAL COMPANY. Recent market research conducted by Dow Chemical Company indicates that chemical odor is a triggering mechanism for complaints. "It's not generally the neighbor that's complaining," explains Mike Hoff, Product Communications Manager. "It's generally the neighbor that has not elected to use the lawn care service." Typically a problem for the lawn care professional, Dow hopes to help curb the potential for chemical trespass with the introduction of its new low-odor Dursban® Turf Insecticide.

The new insecticide contains a refined grade of chlorpyrifos, the product's active ingredient, which does not possess your "typical" phosphate odor. While the new formulation improves applicator comfort and reduces neighbor complaints, Dursban Turf Insecticide provides outstanding efficacy and residual activity, according to the company.

In 1986 Dow will continue to promote its Turflon D® ester herbicide, which was launched at the beginning of this year as a post-emergent, general-purpose, broadleaf herbicide, but the company will also introduce a new package design delivery system for its Dursban Wettable Powder — in the form of water-soluble, polyethylene packets. "The lawn care operator no longer has to deal with a messy wettable powder," Hoff says. "He just throws one 4-ounce packet into his whole spray tank and it really dissolves well." Packaged in an overpouch containing four 4-ounce packets, the



product thoroughly dissolves in two minutes.

In response to the chemical safety issue and the need for communication between the lawn care industry and consumers, Dow developed a turf safety door hanger in 1985 that was well-received by the field. Over 750,000 pieces were printed, detailing the merits and safety of lawn service without mentioning any specific product or chemical manufacturer's name. They are available from the Professional Lawn Care Association of America.

"I think the public's fear of chemicals is always going to be present," Hoff says. "The important point is that the industry has to address the issues that the consumer is raising. The consumer is a highly educated individual today versus the consumer of 15 years ago. And if the industry has the tools and the wherewithal to address a concern of the consumer rather than walking away from the problem," he explains, "I think the long-term prospects of the whole pesticide issue as it relates to the lawn care industry will be easier to cope with." The turf safety door hanger, he adds, represents Dow's interest in maintaining strong communication between the industry and the public.

ELANCO PRODUCTS COMPANY. Two pre-emergent turf herbicides, XL® (for warm-season turf) and Team® (for cool-season turf), are topping the New Year list of lawn care chemicals to be broadly distributed by Elanco in 1986. Both herbicides provide long-lasting control of the early grasses and late grasses with one application.

According to Elanco Information Specialist Paul Abbott, the products were available for limited distribution in 1985. "I've talked to some of the golf course superintendents who have used both products recently and they found that the products did what they expected them to do — and that is, have long season control with one application. The efficacy was generally equal to other alternatives and the cost was generally lower," he reports.

Rubigan®, a fungicide for both warm- and cool-season turf, is also new to Elanco's chemical line-up. It is labeled for control of most major turf diseases, most notably dollar spot. "Rubigan is a locally systemic fungicide," says Abbott. The advantage of that, he explains, is that the fungicide enters the leaf and protects from the inside. After Rubigan dries on the foliage,

irrigation or rain will not cause problems.

The new fungicide is also effective in the management of *Poa annua*. "Depending on how it's applied," Abbott notes, "Rubigan can preserve *Poa annua* from dollar spot, a particularly destructive disease on *Poa*. However, if it's applied in a consistent program and a certain cumulative rate is achieved," he says, "it will reduce the *Poa annua* population."

With warm-season turf — on Bermudagrass — Rubigan is *guaranteed* to reduce *Poa annua* by at least 75 percent. "There's a product replacement guarantee which was just introduced this year, so that's another neat factor," says Abbott. "It's the first product to have guaranteed *Poa annua* control, and that is specifically in Bermudagrass turf."

Elanco is also introducing a new product for control of brush and weeds that choke fence rows and ditch banks. Spike® DF, a dry flowable herbicide formulation, is packed in a disposable 4-pound plastic jug, and one jug can

Elanco's new Rubigan fungicide is the first product to have guaranteed *Poa annua* control, specifically for Bermudagrass turf.

cover more than 1.5 acres of brush. According to the company, one application controls multiflora rose, briars, and over 100 species of woody and herbaceous plants.

Spike is not a restricted-use pesticide, so livestock can continue to graze in areas where the herbicide is applied. However, it must not be used near desirable trees since they are woody species susceptible to the effective control of Spike.

Elanco has also made some changes to its established Balan® herbicide for the New Year. The improved Balan has a new particle size that improves spreadability, reduces dust, and increases calibration accuracy. The new particle size results from the use of a clay carrier, which spreads more uniformly than limestone or corncob carriers. Identified by a yellow starburst on its white bag, the new Balan package has new spreader settings listed on it.

As for future turf chemical development, Elanco is looking at the "unsatisfied needs of the industry," says Bill Culpepper of the company's Specialty Products Division. "To have another annual grass control product in the turf

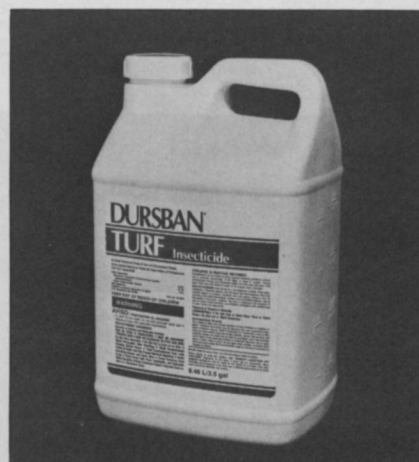
industry would certainly be, at best, a 'me-too' compound to add to a pretty good existing stable of compounds. You have to look at chemistry that can fill needs that today are not being filled," he explains.

Turf insecticides and plant growth regulators are two areas Elanco is currently examining. In fact, the company has developed a plant growth regulator exclusively for the lawn care industry, which is currently being tested under an experimental use permit. Known as EL-500 or Cutless, it will probably be a couple of years before studies are finished for EPA registration of the plant growth regulator.

LEBANON CHEMICAL CORP.

The Lebanon Pro SCU Blends line of fertilizers has been expanded for 1986 with the addition of four new products — Lebanon Pro 33-2-5 (formulated with a combination of urea and organic nitrogen for a fast green-up plus long-lasting color, and slow uniform growth), Lebanon Pro 30-5-10 (a special blend of straight urea with CIL Sulphur Coated Urea, high in potash, which helps improve wear resistance and protects turf from drought, disease, and winter damage), Lebanon Pro 25-10-10 (featuring the controlled release benefits of CIL SCU plus a high level of N-P-K, and phosphorus and potash at 10 percent with 2 percent iron), and Lebanon Pro 16-4-8 (a combination of quick and slow release features in a unique blend for fast green-up and extended feeding).

For the golf course market, Lebanon introduces Country Club 8-24-24, a new homogenous formulation with 30 percent WIN and 100 percent sulphate of potash. Designed for three specific turf applications — fall and late fall feeding, where potash levels are low,



Dow Chemical's Dursban® Turf Insecticide

and where low nitrogen and higher potash is desired — one application during the growing season helps insure winter and summer hardiness, increases disease resistance, and promotes more erect growth.

Also for 1986, Lebanon has changed many of the bases for its fertilizer-chemical combination products to a standard 19-4-6 25 percent organic fertilizer. These include: Country Club 19-4-9 with Betasan®, Country Club 19-4-9 with Dacthal®, Country Club 19-4-9 with Ronstar®, Country Club 19-4-4 with Oftanol®, and Country Club 19-4-4 Insect Control with Dursban®.

LESCO, INC. "More people are leaning away from wettable powder formulations and instead going to flowable formulations or dispersable granules," according to Gregory Richards, Chemical Product Manager for LESCO. Why? "The biggest factor," he says, "is that there's no dust or a minimal amount of dust when you pour it in the tank. Most exposure problems happen when applicators are handling the raw materials, the concentrate." Dispersable granules and flowable formulations are also easier to measure than wettable powders, he adds.

Dispersable granule products cost a little more to formulate than wettable powders, Richards says, but that's what LESCO customers want. And that's what they're going to get. The company is adding Pre-M 60 DG Herbicide to its product offering. One low-rate application controls crabgrass, foxtail, barnyardgrass, and tough broadleaves like oxalis and spurge. A heavier rate provides season-long goosegrass control.

Compatible with most fertilizers and pesticides, Pre-M has no odor to bother applicators or customers. It is labeled for most northern and southern grasses, and has minimal photodecomposition and volatility, reducing the need for immediate watering.



Stauffer Chemical's Pro-Drone® Insect Growth Regulator

The pre-emergent herbicide is packaged in small acre-increment bags for easy shipment, simple handling, and convenient disposal. No triple rinsing or disposal of 55-gallon drums is necessary.

In fact, LESCO is very aware of the chemical disposal concerns facing lawn care operators today. To address the issue and offer an option to customers, the company is making 550-gallon tanks available for sale. "We can then deliver to customers in bulk," Richards explains. "We'll have a truck that'll go around once a month or once every three weeks and ask customers if they need to top their tanks. It's going to cut way down on the amount of material they have to dispose of as far as containers are concerned," he adds. "We've seen more and more people going toward this method."

LIQUI-LAND CORPORATION.
Low-volume liquid fertilizer formula-

"We all have to be looking, to a degree, to control ourselves so that we're not hit with a lot of regulations that might be difficult to adhere to," says Sandra Nelson, President, Liqui-Land Corporation

tions are getting a lot of attention at Liqui-Land Corporation. Having converted their own local lawn spray business in Niles, Michigan, to a low-volume operation earlier this year, the company is confident about the specific low-volume formulations it will be able to offer its customers in 1986.

According to President Sandra Nelson, "There is more control to the release pattern of these products. I think we're going to see more and more controlled-release nitrogen sources used, and this goes hand-in-hand with low volume."

Liqui-Land is interested in "chemicals that are going to be environmentally safe and do a better job than they have done before." Nelson says, "We all have to be looking, to a degree, to control ourselves so that we're not hit with a lot of regulations that might be difficult to adhere to. Let's all look toward the trend of being more environmentally conscious and control ourselves," she emphasizes.

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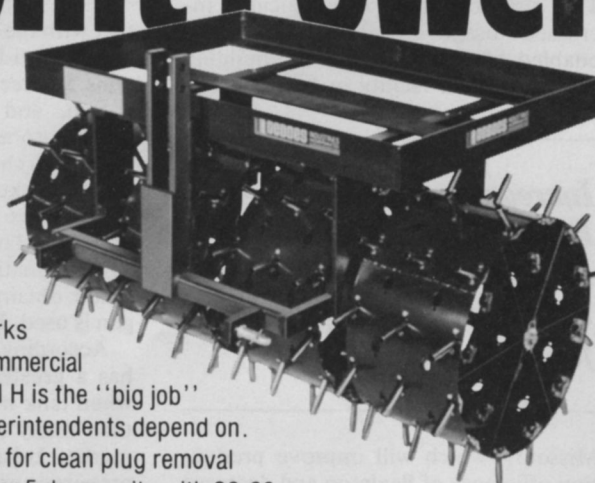
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Milorganite® Natural Organic Fertilizer — 1986 marks the product's 60th anniversary. Unchanged since 1926, Milorganite is an all-purpose fertilizer that's easy to apply without danger of burning. That's because the fertilizer does not contain any chemical salts. What it does contain is natural organic nitrogen, phosphorus, and iron — which are all released gradually to insure uniform color and growth. And not just on grass — Milorganite may be applied to plants, flowers, shrubs, and trees as well.

The Milwaukee Metropolitan Sewerage District is looking forward to its product's Diamond Jubilee. "In a time when products come and go, burst to prominence and then disappear from the market," says Don Gurda, Marketing Manager, "it is very unique for a product to be around for its 60th anniversary — unchanged and unchallenged."

MOBAY CHEMICAL CORP. A new formulation of Mobay Chemical Corporation's Dyrene® 4 Turf Fungicide will be available to lawn service professionals in 1986. Previously offered as a wettable powder, Dyrene will be introduced next year in a liquid formulation for leaf spot control. "We have been able to reduce the rate to make it very economical for the lawn service people," says Allan Haas, Manager of the company's Specialty Products Group.

Lawn care operators will also see a reduction in the price of Bayleton® 25 Turf and Ornamental Fungicide. Increased usage of the product has enabled Mobay to initiate the building of a new plant facility in Kansas City,

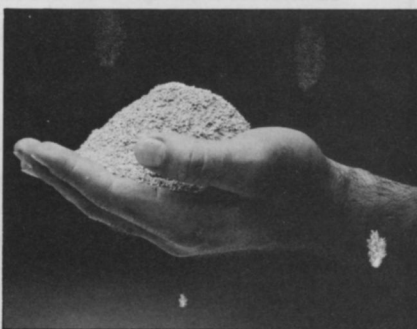
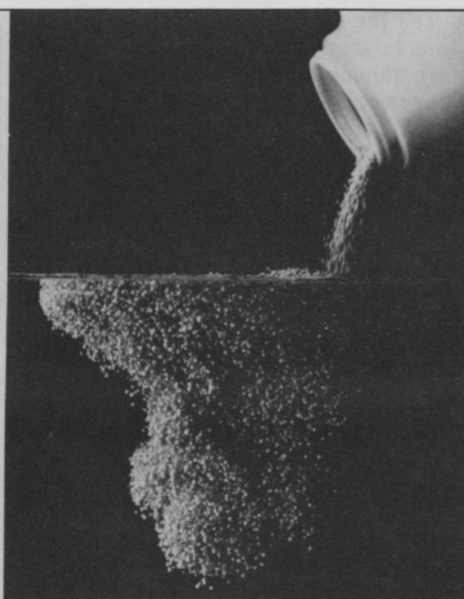
Increased usage of Bayleton has enabled Mobay to initiate the building of a new plant facility in Kansas City

Missouri, which will improve production efficiency of Bayleton and decrease its cost. Mobay wants to pass that savings onto the end-user, Haas notes.

RGB LABORATORIES, INC. According to Dr. Bill Barone, Director of Technical Marketing for RGB Labs, there is an increasing awareness of the dangers associated with using excess nitrogen to achieve a green-up on turf. "It has become recognized," he says, "that iron can alleviate the green-up responsibility formerly given exclusively to nitrogen." And RGB Labs is proving



Elanco's Spike® DF



Elanco's Balan®

that with the introduction of its new fertilizer, Agri-Plex Fe®. The product contains 5 percent phosphorous, 8 percent potash, and 8 percent chelated iron notes Barone. "And it is the most concentrated chelated liquid iron product on the market."

Agri-Plex Fe "dramatically" decreases a lawn's disease-susceptibility by eliminating the flush of growth that's obtained when excessive nitrogen is used, he says.

According to RGB Labs, Agri-Plex has a greater degree of compatibility, when tank mixed with other chemicals, than many other iron products on the market. It has no odor, and its chelated properties prevent staining.

RHONE-POULENC CHEMICAL COMPANY. No new chemical product registrations are in the works for Rhone-Poulenc in 1986. However, according to Jerry Staahl, Chipco Products Manager, Ronstar® T has received two new labels for the coming year. The herbicide has been labeled for use on buffalograss, dry climate grass, and for the control of sand burr, a weed problem found in the Great Plains states.

ROCKLAND CHEMICAL CO.

Lawn service professionals receiving an influx of telephone calls complaining of deer problems may be interested in a new product recently introduced by Rockland Chemical Company. Called Deer Guard®, the product is used to prevent deer from feeding on homeowners' shrubbery.

Of course, the deer market may be obscure for many lawn care operators, so you might want to check out the other products being offered next season by Rockland. Lawn care professionals should be on the look out for the company's new combination fertilizer with Elanco's new pre-emergent Team®. "We're looking for anywhere from 12 to 16 weeks of control for crabgrass," says President John Wittpenn.

A new Professional Lawn/Weed Killer will also be available next spring. Wittpenn says the lawn/weed killer will be a combination of 2,4-D, NCPT, and 2,4-DP. "And it's going to be all amines, which will make it a very safe-to-use product," he explains. "The other three-combination products have all included Banvel D, which can be injurious to shallow-rooted trees."

STAUFFER CHEMICAL CO. To date, most talk about insect growth regulators (IGRs) has been centered around the structural pest control industry. But lawn care professionals should be alert for new biorational compounds which may benefit them and not just their indoor counterparts. Stauffer is introducing a fire ant bait called Pro-Drone®, which is a non-poisonous, biodegradable insect growth regulator that eliminates development of worker ants, resulting in the eventual death of ant colonies.

Now available in 25-pound bags for

commercial use and 6-ounce shaker-top cans for homeowners, Pro-Drone may be applied on lawns and in gardens and parks to control fire ants outdoors.

Because each IGR works on a specific target pest, the lawn care industry may not see an overwhelming number of insect growth regulator products, says Herb Day, Manager of Technical Services at Stauffer. "When you've got a broad-scale insect population affecting turf — grubs, webworms, chinch bugs, mole crickets, and everything else — it's almost impossible to come up with an IGR for all of those insects. And that means they may be more expensive to use if you have to use three or four different products."

Stauffer is also promoting its new grass growth regulator called Short-Stop®. It is now labeled for use in 17 states as a granular formulation. Applied after winter dormancy breaks, Short-Stop suppresses seedhead formation of tall fescue, reducing and in some cases eliminating the need for mowing.

Turf treated with Short-Stop is greener than untreated turf, and the product is not effected by rainfall. It can be used on highway, powerline, and railroad rights-of-way, airport dividers, cemeteries, and other utility turfs.

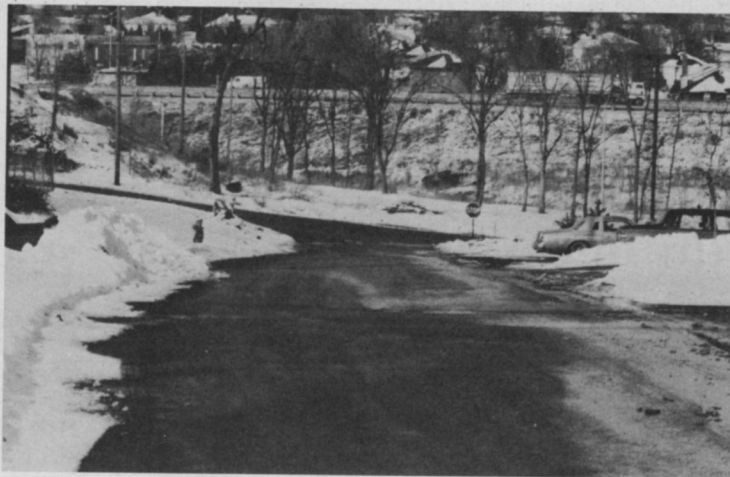
UAP SPECIAL PRODUCTS. The Clean Crop line of products is expand-

"Turcam has a very effective grub control agent, and it's virtually odorless," according to Dennis Faith, Operations and Production Manager, UAP Special Products

ing in 1986. For starters, UAP Special Products will be offering new formulations of some of its existing products. Dacthal 75 WDG (water dispersible granule) is a pre-emergent herbicide previously packaged as a wettable powder. The new formulation will eliminate dust, make for easier measurement, and eliminate waste, according to Dennis Faith, Operations and Production Manager for UAP.

A new residual carbamate granular insecticide is also available — Turcam 2.5G. Offered as a sprayable wettable powder in the past, the new formulation is applied as a dry material. "Turcam has a very effective grub control agent, and it's virtually odorless," explains Faith. "The positive thing about it is that it has very quick results. It's totally soluble and it doesn't tie up in thatch."

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Mecamine D is a brand new product from UAP. It's a three-way combination, post-emergent herbicide which combines MCPP, 2,4-D amine, and dicamba. According to Faith, it's easy to use, economical, effective, and broad spectrum.

Another new product, Systemic Weed and Grass Killer 10% Concentrate, is a 10 percent glyphosate, non-selective, total vegetation control herbicide. It is for general weed control and lawn renovation. Two other new formulations offered by UAP for 1986 are also a little more specialized — a flowable gypsum formulation and a flowable limestone formulation. Both are for soil amendment and pH modification, Faith says.

UNION CARBIDE. Two new products are joining the Weedone® line-up. For professional weed control and ornamental turf, Union Carbide introduces Weedone Super D Pro Amine Herbicide, a more concentrated form of a Super D that has already been marketed by the firm for many years. "It simply is going to be more economical for professional users," says Barbara Emerson, Senior Product Coordinator for Herbicides and Plant Growth Regulators. "They can buy the material for a much lower price because there's less diluent



Lebanon's Country Club® 8-24 Fertilizer

there and less shipping charge."

The second product, Weedone Ready-to-Use Brush and Vine Killer, is a combination of 2,4-D and dia-chlorprop in a special penetrant. It can be used for easy control of unwanted woody vegetation and vine around houses, cabins, storage buildings, campgrounds and other recreational areas, and along trails, fence lines,

rights-of-way, and other non-crop sites.

An attribute most lawn care professionals will relish is the brush and vine killer's ready-to-use, throw-away container. "It's a very interesting material because if there are one or two unwanted trees the applicator can just get out the container and squirt them," explains Emerson. "It can be used at any time of the year. And there's no diluting to be done. You don't have to get any equipment out. It's just already to go."

CONCLUSIONS. Of course, we've only included a sampling of the many turf chemical products that will be on the market for the New Year. Many manufacturers contacted by *American Lawn Applicator* were unable to disclose their new products at presstime, and naturally, space dictates a certain portion of what we can include in the issue. One thing's for certain though, it looks like 1986 has much to offer the lawn care professional in terms of turf chemicals. And it sounds like chemical manufacturers and formulators are continuing to pine away for products that are safe and more effective. — Vivian Fotos Rose ■

The author is Assistant Editor of ALA magazine.

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WETTING AGENTS

We still have a lot to learn about wetting agents, but lawn care professionals can still profit from the use of these materials.

Wetting agents have played a controversial role in turfgrass management. They have been heralded by some and scorned by others. Throughout the controversy, interest in their use has continued and with this interest we have learned more of their potential use in turfgrass culture.

Wetting agents have also been referred to as surfactants. They are similar to spreaders and stickers that are commonly used in the lawn care industry. Wetting agents break up the surface tension of water (Figure 1). Water droplets from rain, irrigation, and sprays often form beads on plant, soil, and thatch surfaces (i.e., similar to those formed by rain on a newly-waxed car).

This is the case when water is applied to hydrophobic (water repelling) surfaces, as opposed to hydrophilic (water loving) surfaces. Wetting agents reduce the surface tension allowing the water droplet to have a smaller contact angle, but cover a larger surface area. Thus wetting of the surface is enhanced.

Wetting agents may be referred to as anionic, cationic, or nonionic. Anionic wetting agents are negatively charged and cationic surfactants are positively charged. Nonionic wetting agents are neutral. Negatively charged surfactants are rarely used in turf culture. They have a tendency to be more phytotoxic than cationic or nonionic surfactants and may cause unde-

sirable burn. Cationic materials, on the other hand, may be bound on negatively charged soil and organic matter particles and be rendered ineffective. Therefore, nonionic wetting agents are most commonly recommended for turfgrass culture.

When purchasing wetting agents, turfgrass managers should pay close attention to what they are purchasing. The surfactant should be nonionic. It should consist of a maximum amount of active ingredient and a minimum of inert (i.e., usually water). Nonionic wetting agents are comprised of active ingredients such as ethers, esters, and alcohols. These materials are used in varying combinations to form the active ingredients, according to the manufacturer's specifications.

Ethers are more efficient in clay soils than alcohols or esters. Esters work best in sands and alcohols work best on high organic matter soils. Ethers enhance the speed of soil wetting, while esters improve longevity of response. Therefore, combinations of esters, ethers, and alcohols are typically used to enhance responses to varying environmental conditions and soil types.

Wetting agents have been reported to improve soil infiltration, soil water percolation, soil drainage, and wetting of localized dry spots. They have been reported to reduce evapo-transpiration rates, reduce thatch build-up, decrease disease incidence, minimize dew formation, reduce soil compaction, influence plant growth, and enhance fertilizer and pesticide use efficiency. Some of these reported effects have been substantiated by research and others have not. This is partially due to the fact that a limited amount of research has been conducted with wetting agents applied to turfs and that some of the claimed effects on soils and plants are interactive with a number of other cultural, environmental, and soil conditions.

Adverse effects of wetting agents have also been reported. These include reduced plant root production, decreased soil particle aggregation, reduced soil moisture retention, and increased thatch accumulation. Very little research exists to support these reported effects. More concentrated effort on the part of turfgrass researchers and turfgrass managers is needed to develop a better understanding of wetting agents and their potential use in turfgrass culture.

Studies in recent years have demonstrated improved turfgrass quality with wetting agent applications, especially when localized dry spots are involved. Studies at Michigan State University under the direction of Drs.

Wetting Agent	Rate (oz./1000 sq. ft.)	Turfgrass Quality ² (9=best; 1=poorest)
Control	—	6
Aqua Gro	4	7
All Wet	4	7
Surfside 37	4	7
Surfside 30	4	7
Surfside 80	4	7
Surfside 19	4	8

²Values are means of six determinations taken during the 1983 growing season. Values were rounded to the nearest whole number.

Table 1. Mean turfgrass quality rating for Kentucky bluegrass turfs receiving monthly wetting agent treatments during the 1983 growing season.



(Above) Wetting agents can help obtain more efficient soil wetting, particularly when localized dry spots are a problem. (Below) Localized dry spots reduce turfgrass quality. Wetting agents used in conjunction with soil coring can effectively reduce the problem.

Rieke and Beard demonstrated that core cultivation using 1/2- or 5/8-inch tines in conjunction with Aqua Gro at 16 ounces per 1,000 square feet gave the best results for reducing localized dry spots and improving turfgrass quality. Michigan research also demonstrated that Aqua Gro and Hydro Wet wetting agents reduced localized dry spots when applied in monthly applications of 8 ounces per 1,000 square feet throughout the growing season.

Research at Virginia Polytechnic Institute and State University by Dr. Schmidt demonstrated enhanced rooting of sod treated with Aqua Gro prior to transplanting. Wetting agent-treated sod rooted much faster under low soil moisture conditions than did the non-treated sod. The enhanced rooting may have been due to improved soil water infiltration and better soil profile wetting from irrigation.

A study at the University of Nebraska Agricultural Research and Development Center, located near Mead, has compared the effect of monthly applications of six wetting agent treatments on Kentucky bluegrass turf quality, thatch accumulation, and water use. The bluegrass turf was comprised of a blend of Baron and Glade Kentucky bluegrass which was established in 1980 on a Sharpsburg, Nebraska silty-clay loam soil.

Wetting agent treatments were initiated in mid-summer of 1981. The turf was mowed three times weekly at 0.75-inch to maximize stress. They were fertilized with 4 pounds of nitrogen per 1,000 square feet per growing season and were watered regularly to prevent visual drought stress. Turfgrass quality varied only slightly between treatments (Table 1). The con-



trol had consistently lower turfgrass quality ratings during the period of June to September, but did not differ from the wetting agent treatments during the remainder of the growing season. The product Surfside 19 consistently ranked highest in turf quality ratings when compared to other treatments. Wetting agent treatments had no significant effect on thatch accumulation after five successive years of treatment with 4 ounces per 1,000 square feet per growing month.

These results agreed with results found by Dr. Smiley at Cornell University in New York.

In a 10-year study conducted at Rutgers University, Dr. Engle reported a slight increase in thatch build-up as a result of wetting agent treatment. This was thought to be attributable to a reduction in microbial breakdown activity and increased organic matter accumulation. However, in this researcher's opinion, wetting agents play only a minor role in thatch accumulation when compared to other factors influencing thatch.

Wetting agents have a marked effect on turfgrass evapotranspiration rates (Table 2). All wetting agent treatments reduced evapotranspiration rates for varying times when compared to the untreated control. Using the control for comparison purposes (i.e. 100 percent), Surfside 19 used 31 percent less water at four weeks after treatment (Figure 2). Aqua Gro and All Wet used 16 percent less water than the control for the same time period. Wetting agent responses in this study were transitory, declining with time after treatment. Reductions in evapotranspiration were greatest during periods of peak evapotranspiration demand (i.e. mid-summer) and least during the fall. How-

Wetting Agent	Rate (oz./1000 sq. ft.)	ET Rate (inches/day)		
		6/9	6/15	6/22
Control	—	0.34 a ²	0.39 a	0.39 a
Aqua Gro	4	0.29 b	0.33 bc	0.33 b
All Wet	4	0.28 b	0.34 bc	0.33 b
Surfside 37	4	0.27 bc	0.35 b	0.34 b
Surfside 30	4	0.25 c	0.33 bc	0.33 b
Surfside 80	4	0.25 c	0.33 bc	0.33 b
Surfside 19	4	0.25 c	0.31 c	0.27 c

²Values in a column followed by the same letter are not significantly different at the 5% level of probability.

Table 2. Evapotranspiration (ET) rates for Kentucky bluegrass turfs treated with wetting agents on a monthly basis throughout the growing season (1983).

ever, the relative ranking of treatments remained consistent for spring, summer, and fall.

The reduction in evapotranspiration rates by wetting agent treatment may have been a result of having less water available for evapotranspiration. Wetting agents enhance the downward movement of water in the turfgrass soil profile, therefore less water may have been available at or near the soil surface. Research has demonstrated that evapotranspiration rates are high immediately following irrigation and that these rates decline with time after

irrigation.

This increase is likely due to an increased significance of evaporation in the evapotranspiration process, since considerable water is available for evaporative loss from plant leaves, thatch, and surface soil immediately after irrigation. Wetting agents reduce the potential magnitude of this evaporative loss by moving the water away from the thatch and soil surface, particularly when turfs are maintained under well-watered conditions.

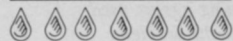
There is little or no evidence to support claims that wetting agents can reduce soil compaction. Drainage can be improved in soils when wetting agents are applied, especially when soil layering is present. Therefore, wetting agents could be used to reduce surface soil moisture and subsequently minimize soil compaction on heavily trafficked areas. More research is needed in this area before conclusions can readily be drawn.

Controversy over the continued use of wetting agents still exists. This controversy is likely to continue as long as there is a dearth of research data to support claims about wetting agent strengths and weaknesses. Turfgrass researchers should be challenged to look into this area of research with an open mind. More will be learned about wetting agents and new chemistry is likely to occur, as well as refinements in management strategies for use of the existing materials.

Turfgrass industry, turfgrass managers, and the lawn care industry will be called upon to support research with wetting agents. Hopefully, with this support, more can and will be learned about wetting agent use in turfgrass culture. Lawn care operators should keep in mind that until this comes to fruition, wetting agents are useful turfgrass management tools and that with proper use they can be beneficial to lawn care programs. — Robert C. Shearman ■

The author is Associate Professor — Turf, Department of Horticulture, University of Nebraska, Lincoln, Nebraska.

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- Penetration up to 2 3/4".
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- Covers up to 21,000 square feet per hour.
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- 3 h.p. industrial engine with rotary stop switch for easy shut-off.
- Fuel tank holds two quarts.

Designed for the professional who wants to provide quality core-type aeration at a high rate of speed, the new Lawnaire IV is the most dependable walk-behind roll-type aerator on the market.

More and more homeowners are asking for lawn aeration to break down thatch and improve turf quality. The Lawnaire IV offers lawn care professionals and rental outlets a core aerator that pays for itself in just weeks.

LAWNNAIRE IV SPECIFICATIONS

Model 544863

DIMENSIONS

Width 28"
Swath 19"
Weight Dry-215 lbs.
Water in drum-265 lbs. (6.6 gallon capacity).

POWER

Engine 4-cycle, 3 hp industrial with 6:1 gear reduction, dual air cleaner, with rotary on-off switch, low tone muffler.
Clutch Belt tightener.
Driver Primary: V-belt 4L-section to clutch idler. Secondary: #40 roller chain to tine assembly. Transport: #40 roller chain to barrel.

Lubrication Two grease fittings in each axle hub.

UNIT

Penetration Up to 2 3/4"
Aeration Pattern 3 3/4" x 7" center to center.
Speed Operation: 225 f.p.m.
Transport: 190 f.p.m.
Productivity Up to 21,000 sq. ft. per hour.
Tines 3/4" Coring-type, formed from .08" thick heat-treated alloy steel, 30 tines per aerator.
Tires Two 8 x 1.75 semi-pneumatic with ball bearings.

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Tine Replacement Part #522361



PRODUCTS

Northern Hydraulics has recently introduced the new Trencherman towable back hoe. A unique, easy to operate, hydraulic back hoe that you can tow behind a car or pickup truck. The unit generates over 3,000 pounds of ripping force, digs to 7 feet plus. It is economical to operate and priced under \$5,000.

Write 101 on reader card

New England Green has successfully introduced its Equipment Engineering Services Division. The company produced approximately 50 vehicles during the 1985 season. The vehicles were custom-made tank trucks built to the individual customer's specifications.

New England Green will be displaying its quality-built spray equipment at

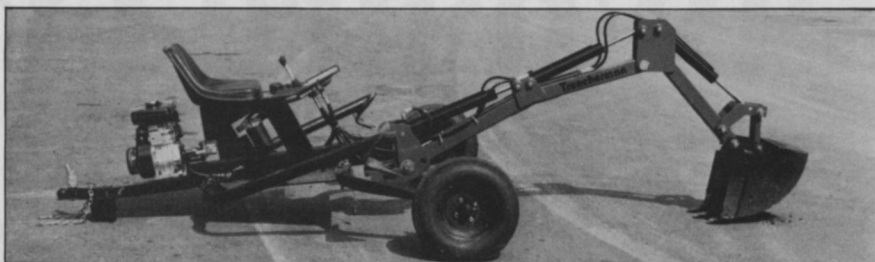


the annual PLCAA meeting in Tampa, Florida this month. All units to date have been designed with low-maintenance, cosmetically appealing, fiberglass tank configurations. They can be PTO driven or powered by deck-mounted auxillary engines. Regardless of pump preferences (i.e., piston or diaphragm), New England Green can meet your lawn or tree spraying needs. The company's primary objective is to build the strongest, most reliable, cost effective equipment possible.

Write 102 on reader card

The Yard-Man Company has introduced a new Model 31150 Compact Single-Stage Snowthrower that, unlike many in its size and price class, is a true snowthrower in all respects. Featuring an all-steel chassis and auger chamber, its 8.5-inch diameter Arctic Rubber Spiral auger is capable of performing snowthrowing tasks formerly attributed only to larger units, according to the company. It clears a 21-inch path.

The unit features a 3 horsepower, winterized, two-cycle engine with rewind start and key shutoff. There is one forward speed and handle-mounted auger clutch and throttle control for easy operation. The 180-degree discharge angle directs the snow where desired from its steel deflector chute



that operates from a stand-up position. Optional electric starting is available.

Folding chromed steel handles provide small off-season storage. Shipping weight is approximately 70 pounds. A companion Model 31151 features 110-volt electric starting and rewind start.

Write 103 on reader card

Light duty truck owners are now prepping their trucks for the upcoming snowplow season. In addition to the plow equipment, the vehicle suspension will need strengthening to accommodate the weight of the plow.

Air Lift Company's Polyair Spring suspension aid add-on bolsters the suspension to relieve sag and strain. Applications are now available for most domestic and import light trucks. The Polyair Spring adapts to coil and leaf



spring equipped trucks. They are fully air-adjustable, enabling the owner to alter the spring rate (stiffness) simply by varying pressure. When the truck is not being used for plowing, the Polyairs can be deflated for normal ride comfort.

Write 104 on reader card

Watch out ice and snow — **The Andersons** has unleashed Ice Fyter with Tracton®. This new product provides quick traction on driveways, porches, steps, and sidewalks during the winter months.

This product is not like salt. It won't leave a white residue on surfaces, so it is safe around children and pets. In addition, Ice Fyter has three nutrients

which can actually enhance soil conditions for hardy root development in nearby grass and plants.

"The Tracton in Ice Fyter sets this product apart from other ice melters," says Roger Brown, National Sales Manager-Retail Sales, Lawn Fertilizer Division. "It gives instant traction even before the chemical starts to melt the ice. Tracton also remains on the surface until traction is no longer needed."

Ice Fyter is available in winter-proof packages in three convenient sizes: 10-pound bag which covers up to 300 square feet; 18-pound bag which covers up to 500 square feet; and a 38-pound bag which covers up to 1,200 square feet.

Write 105 on reader card

The **Sno-Way International, Inc.** "Energy Saver" plow, originally designed and engineered to fit two or four wheel drive Subaru, or Subaru Brat is now available for the 1984 Mitsubishi Montero and 1984 Toyota Land Cruiser. "Energy Saver" plows offer an affordable, fuel efficient, easy and comfortable way to clear driveways, sidewalks, parking lots, or country lanes. Weighing only 295 pounds yet a full 80 inches wide, the plow's maneuvering capabilities match or surpass those of more cumbersome, less economical snow plows.

The "Energy Saver" plow is constructed of super strong, high carbon steel and finished in good-looking, long-lasting orange and black epoxy paint. Fully tested in rough Wisconsin winter weather, this multi-purpose plow will provide years of reliable, trouble-free service. The plow's electrical and hydraulic components are factory installed on the swivel sector of the plow. This positioning allows for ease of maintenance, zero pollution to hydraulic system since the plow's assembly is now one integral unit and all hydraulic lines are permanently attached to all angle and lift cylinders.

(continued on page 76)

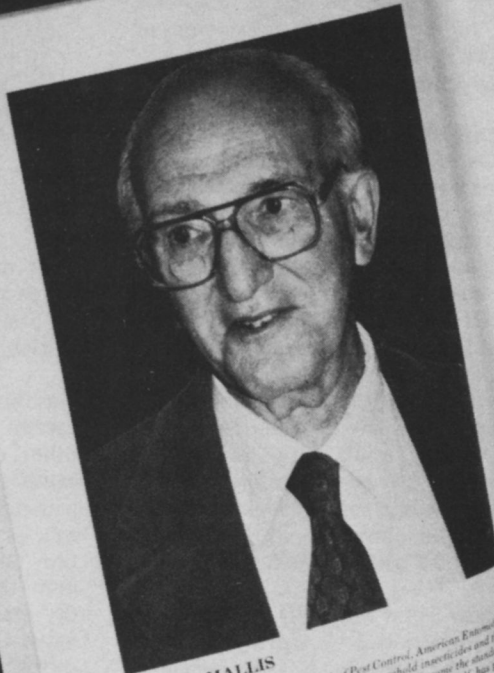
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PRODUCTS

(continued from page 74)

Also from Sno-Way International is a new generation of "high tech" super light weight snow plows called the "Sno-Way See Thru Low Pro®." These models are constructed of clear plastic Lexan mold boards, Polymere wearstrips, and light-weight high carbon steel A-frames and swivel frames. Weighing in at approximately 175 pounds, yet a full 72-inches wide, the plow's maneuvering capabilities match or surpass those of other plows.

The see-through low profile blades enable the use of the vehicle's headlights for both transport and plowing, since the headlights and directional signals are visible through the clear mold



boards. This eliminates the need for expensive auxiliary lighting and time consuming installation.

Write 106 on reader card

Stahl, a **Scott Fetzer Company**, introduces a new bulkhead storage concept for commercial truck applications — the Stahl BackPak. Available in both "L" and "I" models, the BackPak is ideal for construction, landscaping and many other applications. It is constructed of strong galvalume steel to handle a wide range of tool storage require-

ments. The BackPak is a cab-width compartment with a door on each side, and is big enough for power tools, long-handled tools, small engines, hand tools, small tools, boxes, and other equipment accessories. All doors lock for overnight security.

When used with a dump body, the Stahl BackPak remains stationary so tools don't roll around in the bed or side boxes. On stake bed trucks, it keeps tools out of the way for easier loading and unloading of materials. And, the new BackPak is available on all truck makes.

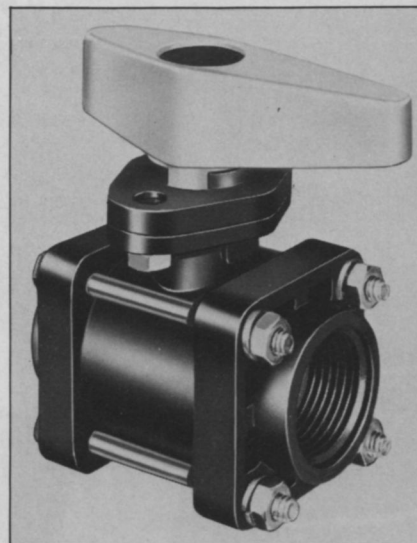
Write 120 on reader card

Clifton Metal Products has announced a new self-dumping trailer. The new trailer is available in two sizes: 2 cubic yards with a GVW rating of 5,500 and 4 cubic yards with a GVW rating of 11,000. The self-dumping trailer is easy to operate and has multiple uses. It can be used for clean-up and general hauling of 2 cubic yards of sand, gravel, wood, etc.

Required lighting and fenders are standard equipment. Options include electric or hydraulic surge brakes, type of coupling device, and color. The trailer comes with a positive locking mechanism on the dumping body.

Write 107 on reader card

The new 344M Manually Actuated Ball Valve, developed by **Spraying Systems Company**, is now available. When open, the 344M Valve allows flow at pressures up to 300 psi with minimal pressure drop (5 psi at 32 GPM) and is available in a two-way and three-way configuration in 3/4-inch and 1-inch NPT sizes. When closed it provides a positive shut-off. The 344M Ball Valve is constructed of corrosion resistant teflon, polypropylene, and



glass reinforced nylon. It is designed for easy assembly and disassembly, and for easy installation into a system.

Write 122 on reader card

Gasoline stored in lawn mowers, garden tractors, snow blowers, and other outdoor power equipment can cause starting problems and costly repairs after winter storage. During storage, gasoline "breaks down" and oxidation takes place, creating a semi-fluid gum that results in deposits of hard, dry resin on intake surfaces, including valve stems and carburetor parts.



There is no need to drain gas tanks because the emptier the tank, the more water will condense and cause corrosion. Also, the emptier the tank, the fuller it is of explosive fumes that will remain.

Therefore, it is now recommended that gas tanks be topped and a stabilizer added for winter storage. It isn't safe to drain gasoline, so what is the answer? A product called Stor-N-Start gasoline

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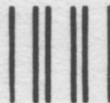
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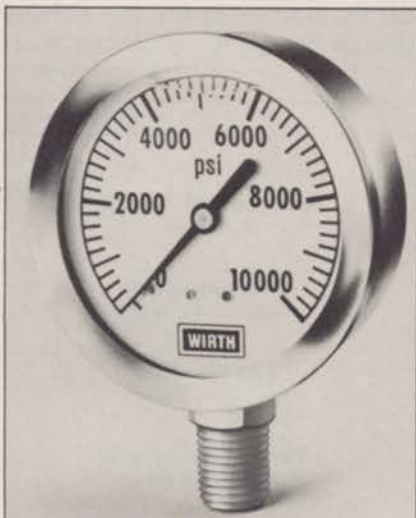
PRODUCTS

(continued from page 76)

stabilizer from **MDR Corporation** has been proven in hundreds of thousands of boats and is now available for other applications. The product contains a powerful anti-oxidant, degummers, inhibitors, and metal deactivators. It keeps gasoline refinery-fresh during storage, prevents corrosion due to condensation, and gives instant starts after storage. A 4-ounce can treats 12 gallons of gasoline.

Write 108 on reader card

"Wirth" all stainless steel and stainless external, brass internal pressure gauges are said to combine a high degree of accuracy, the chemical resistance of stainless steel, and the pulsation dampening advantages of liquid-filled gauges. This Wirth Series is available exclusively in North America through its agent, **Precision Fitting and Valve Company, Inc.** With accurate readings of pressures from 15 psi to 15,000 psi these high quality gauges



have a wide use in the pressure washer, industrial chemical, and lawn care/agricultural market. They compliment Precision's extensive stainless valve, stainless clamp, and nylon fitting products.

Write 109 on reader card

A new "726 Super Light" ramp for fast, easy handling of loads up to 1,500 pounds has been added to the line of fiberglass loading ramps made by **Melcher Manufacturing Company**. The 7-foot by 26-inch "Super Light" ramp weighs only 50 pounds. It can be easily carried in a pickup, step van or high-cube van, and set in place by a single driver for use with a hand-truck. The ramp is designed for trucks with beds up to 28 inches high. Like all Melcher ramps, the unit is made of shape-retaining fiberglass for strength, durability, and high-



load-capacity-to-low-ramp-weight ratio.

Also from Melcher is the Lite-Loader Ramp, constructed of all-weather, zinc-plated steel tubing, with a durable fiberglass surface. A super traction non-skid covering assures safe and secure footing in wet or dry weather. An

anchoring pin is also provided to secure the ramp to the loading level. The 30-inch wide ramp has a 1,000 pound capacity and weighs only 86 pounds. Dual ramps measuring 14-inches by 7-foot, 11-inches can handle loads up to 1,500 pounds, yet each half weighs only 47 pounds.

Write 110 on reader card

A hand protective foam that acts like a glove to protect workers' hands has been introduced by **Valley Research Systems, Inc.** The company says Glove Guard Foam should be used in

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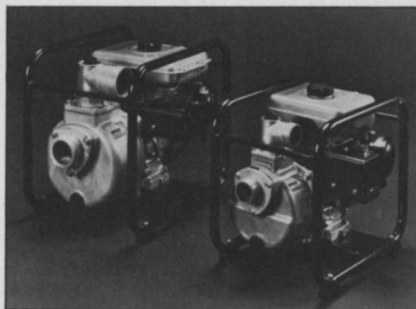
Write 19 on reader service card

every shop for hand protection. The removal of dirt from the hands after working hours has always been an extra job for workers. By simply applying aerosol Glove Guard Foam to your hand, you can alleviate these problems. This product applies like a shaving lather which is worked into both hands and vanishes from sight, leaving an invisible protective film barrier. This barrier protects hands from dirt, grease, chemicals, oils, paints, stains, inks, varnishes, solvents, and other grime. The material also leaves hands soft and conditioned. You simply apply Glove Guard Foam before work and rinse off after work.

Write 111 on reader card

Earth Energy Systems, Inc. will soon market new, lightweight, 2-inch and 3-inch portable gasoline-powered centrifugal pumps in addition to their line of Winco generators. Both pumps feature 4-cycle, air-cooled, Kawasaki engines with low oil level shutdown. Pump castings are die cast aluminum. Volute casings and impellers are cast iron.

Pumping capacity of the 2-inch unit is 132 gpm, maximum head is 98 feet.



Its .8 gallon fuel tank provides 2.4 hours running time under full load and 4.3 hours under half load. Capacity of the 3-inch unit is 236 gpm. Maximum head is 86 feet. A 1.2 gallon tank gives 2 hours running time under full load and 3.5 hours under half load. The manufacturer claims the combination of durability, portability, easy starting, and quiet operation makes these new pumps ideal for homeowner and professional uses.

Write 112 on reader card

Carswell Import and Marketing Associates, Inc. (CIMA), the sole North American importer and marketing agent for **Robin Outdoor Power Products**, now offers 12 new

pieces of outdoor equipment. The products include six models of grass trimmers/brush cutters, ranging from 16cc to 50cc; two models of hedge trimmers, with a 23-inch and 30-inch blade respectively; a 37.7cc backpack blower; and a variety of backpack sprayers and water pumps.

Write 113 on reader card

Echo, Inc. has expanded its line of homeowner/professional chain saws with the introduction of the CS-510EVL, CS-550EVL, and CST-610 EVL chain saws. The CS-510EVL features a powerful 49.9 cc engine with 7 percent higher maximum output and



12 percent higher maximum engine speed than the CS-500EVL. The 510 also has Echo's exclusive Step Advance Ignition System for quick engine re-

(continued on page 82)

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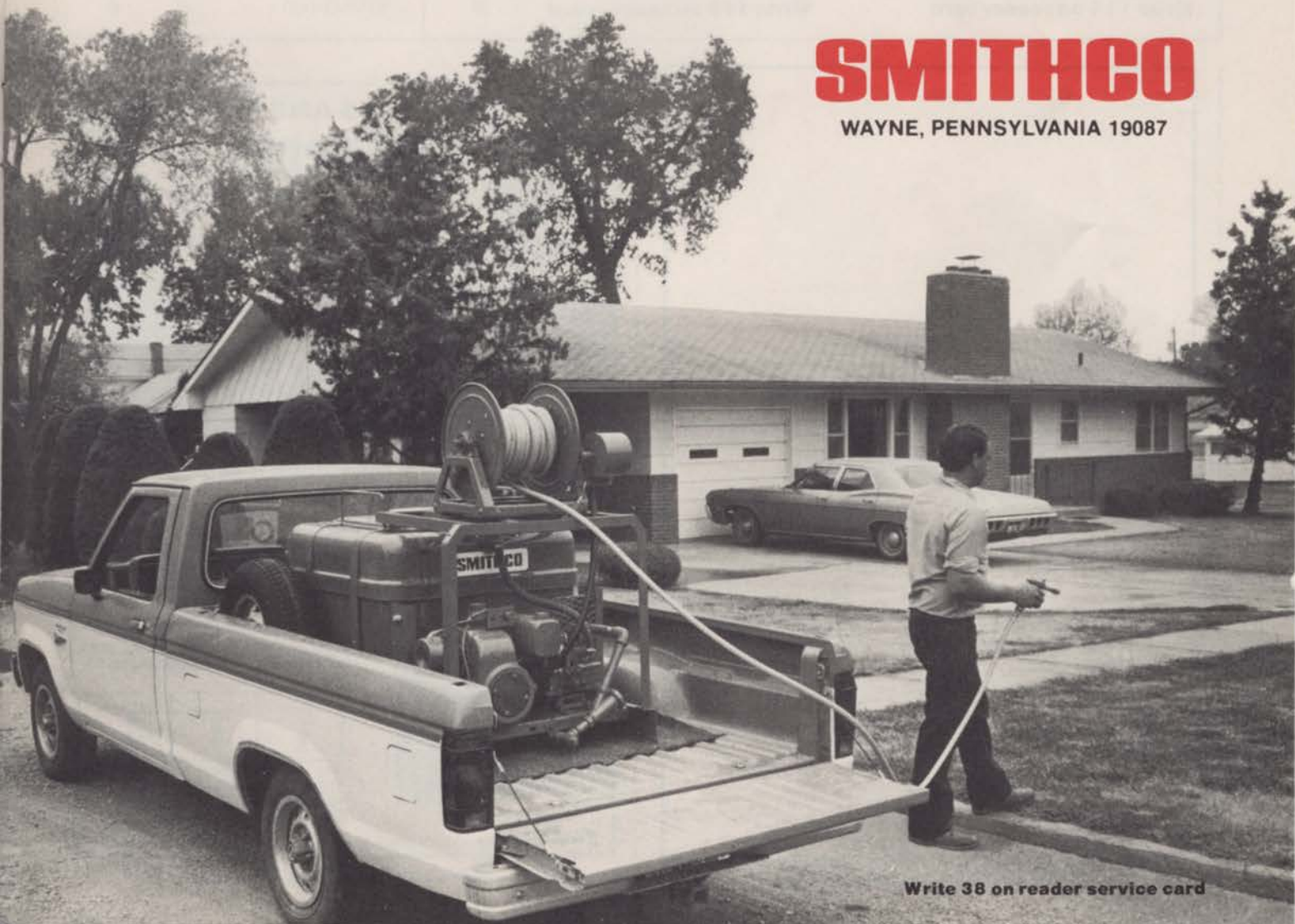
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PRODUCTS

(continued from page 80)

sponse and easier starting, an efficient diaphragm carburetor for constant fuel supply control, a 27 mm-wide front handle for positive control, and a newly designed guide bar cover with a double spike bumper.

The CS-550EVL chainsaw features a 55 cc engine, automatic ignition advance for easy starting, smooth idling and quick acceleration, exceptionally high power-to-weight ratio, and a patented, anti-vibration system for easy handling. The unit also has an automatic oiler for worry-free bar/chain lubrication, a diaphragm carburetor for all position use, and a low-kick chain.

The new CST-610EVL chainsaw has twin cylinders for dramatically less vibration, and noticeably less noise than its heavy, noisy, shaky competitive counterparts. The saw combines two features — two cylinders and simultaneous ignition — that result in outstanding performance. Because the pistons are opposed, they offset each other's momentum which greatly reduces vibration and wear on the saw so it can last longer while increasing operator comfort.

Write 114 on reader card

Norman Prince Associates is proud to announce the introduction of their new Tungsten Carbide Impregnated Saw Chain to their line of chain saw accessories. Each cutter is impregnated with tungsten carbide on both the top-plate and side-plate which will allow you to cut up to 10 times longer between sharpenings. This revolutionary saw chain is available in 25-foot loops and 100-foot reels, or the company will impregnate your own saw chain.

Write 115 on reader card

Optional attachments for **Bunton Company** 71-inch and 61-inch Turf Tractors are available that provide for operator comfort during severe weather and allow use of the tractor for general cleaning and snow removal. A fully insulated cab offers protection from the weather and a roll-over protection system (ROPS) provides greater operator safety in conformance with OSHA regulations. Standard features include two removable doors, sliding rear window, safety glass all around, seat belts, head and rear service light, interior dome light, flashing amber beacon, windshield wiper, and defroster. Optional features include heater kit, air conditioner, and emergency lighting.

Write 117 on reader card

PLCAA NOTES

(continued from page 30)

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402/223-2391

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413/781-0427

Perma-Green Supreme

Tom Jessen, P.O. Box 10547
Merrillville, Indiana 46411
219/663-8417

Southern Mill Creek Products

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Terracare Products Co.

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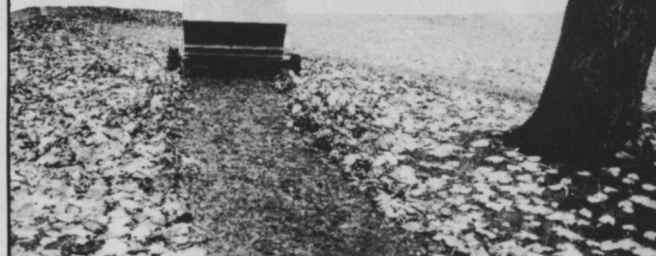
See the new Perma-Green Supreme hatchback sprayers for mini and full size trucks at the Tampa show or call Tom Jessen at 1/800/346-2001 or 219/663-8417 for information on leasing or buying.

Write 52 on reader service card

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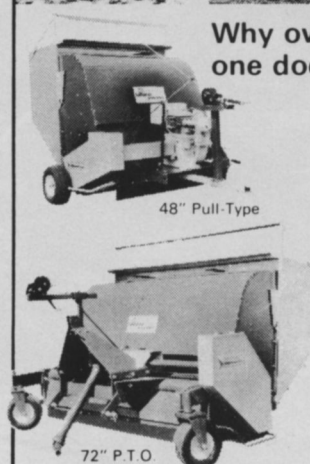
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METHANEARSONATES

(continued from page 50)

This concentrates CO_2 within these cells to 30 to 50 μM , which is enough to saturate RuBPCase and allow it to operate at high efficiency. Photosynthesis of the C_4 type differs from the C_3 type by having a CO_2 trapping the pumping mechanism which allows the ultimate CO_2 fixing enzyme, RuBPCase, to operate more efficiently.

This almost completes the story, except that when Knowles and Benson exposed the isolated malic enzyme to methanearsonate they found it was not inhibited by the herbicide. They noted that sulfhydryl inhibitors (chemicals that bind to sulfur atoms in an enzyme) did block malic acid decarboxylation by malic enzyme, but MAA did not. However, if a more reduced form of MAA, arsenosomethane (CH_3AsO) was used, the enzyme was strongly inhibited. This led them to conclude that the active form of the herbicide was in fact a reduction product, arsenosomethane, and not the methanearsonate.

The two electrons (e^-) involved in the reduction of arsonate are obtained from the photosynthetic electron transport path; the source of electrons used to reduce CO_2 to carbohydrates. In the chloroplasts of the bundle sheath cells

in crabgrass leaves, the methanearsonate herbicide is reduced by electrons derived from water through photosynthetic light reactions. This occurs near the inner membranes of the chloroplast where malic enzyme is thought to be present. The uncharged arsenosomethane is soluble in membrane lipids and thus is formed very close to the vulnerable sulfhydryl group of malic enzyme where it reacts.

This reaction of arsenosomethane with an enzyme located near its site of synthesis may explain why methanearsonates inhibit malic enzyme function, but not that of other enzymes containing sulfhydryl groups. This also explains how methanearsonates can function as detoxified forms of arsenic in algae. Such cells would have no chloroplast malic enzyme, so any arsenosomethane that might be formed through photosynthetic reduction would have no handy sulfhydryl enzyme with which to react.

We can now answer the three questions asked by the concerned client earlier in this article. Methanearsonates control crabgrass without injuring lawn grasses because crabgrass is a C_4 grass and thus depends upon the functioning of malic enzyme for normal photosynthetic metabolism. Cool-season lawn grasses are C_4 plants and have no

chloroplast malic enzyme. Such grasses may reduce arsonate to arsenosomethane, which in turn might react non-specifically with several sulfhydryl enzymes in the chloroplast. Because no specific critical enzyme is likely to be inhibited, there is little plant injury. This action of arsenosomethane might explain the short-lived discoloration which often follows methanearsonate applications to lawn grasses.

The low rates of arsenic effective for the kill of crabgrass when applied as a methanearsonate herbicide can be explained on the basis of its specific site of action. No more arsenic is needed than that required to inhibit one enzyme. That represents very much less arsenic than when toxicity depends upon competition for sites of phosphate esterification (arsenate) or when binding with a common enzyme cofactor is involved (arsenite). The highly specific nature of methanearsonate action is consistent with its activity in low concentrations.

The last question is the most obvious if you know how methanearsonate herbicides work. The toxicity of these compounds depends upon reduction by a photosynthetic electron source. Since most animals and humans carry out little photosynthesis, the herbicide remains in the harmless methanearsonate

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form and there is no toxicity. In fact, as Benson and his coworkers pointed out, the ability to produce methanearsonates is a good way of detoxifying inorganic arsenic. The addition of one or two methyl groups on an arsenic ion alters its chemical and physical properties such that it can no longer enter into those reactions which cause toxicity.

A new herbicide is currently being tested for postemergence crabgrass control in lawn turf. Bearing the common name, Acclaim, this herbicide is providing excellent crabgrass control with a single low rate (0.25 pounds per acre or less). Except for some injury to

newly seeded Kentucky bluegrass turf, Acclaim does not cause the short-lived discoloration commonly observed with methanearsonate herbicides. Within a year or two, Acclaim should be registered for use on turfgrasses and the lawn care professional will have an alternative to the methanearsonates for controlling emerged crabgrass. Until then, the organic arsenicals are the only tools available, but they can be used effectively and safely if the applicator understands how they work. ■

Richard J. Hull

The author is Professor of Plant Science

at the University of Rhode Island, Kingston, Rhode Island.

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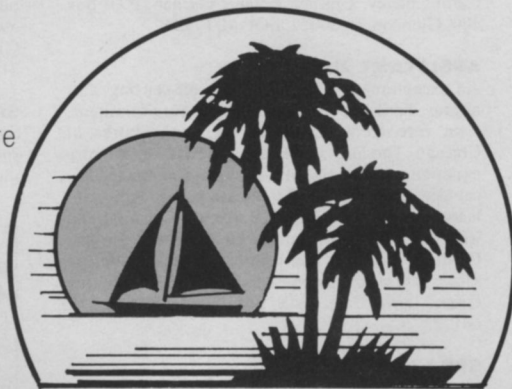
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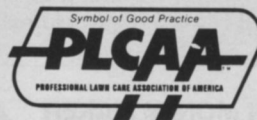
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We'll kick-off the New Year with an indepth feature on buy-outs. We'll also examine a subject that's causing much alarm for many lawn care companies — insurance. Is it the number one problem facing this industry? Find out when we explore the availability of viable insurance for both lawn care and mowing maintenance operators. Keep reading!

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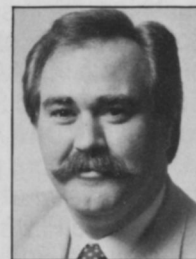
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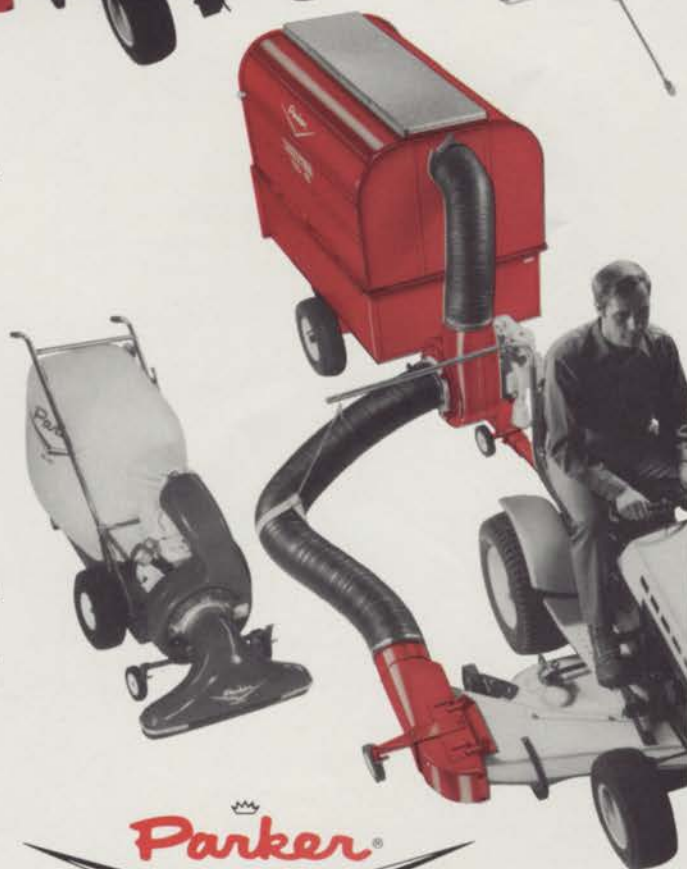
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