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In this issue:

**Pesticides:  
Perception vs. Risk**

**Mulching Mowers**

**Controlling Crabgrass**

**Irrigation System**

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# Lawn & Landscape MAINTENANCE

VOLUME 14, NUMBER 3

MARCH 1993

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Jeff Martin, Eatontown, N.J.

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# Editor's Focus

WHEN IS SEN. Joseph Lieberman, D-CT., going to realize his Notification of Chemical Application Act, as written, is not the answer to federal regulation of pesticide applicators and their products?

Lieberman has been wasting precious time and money pursuing a bill which has not made it through committee in three years. And although he recently released another draft of the legislation, it's unknown when it will be introduced to the 103rd Congress. (Despite the unknowns, it's predicted by some that a new Democratic chairman of the Environment and Public Works committee in conjunction with the potential movement of other environmental legislation this year may elevate the status of this bill.)

Contending with potential federal legislation governing pesticides — namely notification, posting and chemical sensitivity registries — has become a full-time job for those at the Professional Lawn Care Association, the Responsible Industry for a Sound Environment, the Coalition for Sensible Pesticide Policy and others.

And while it can be argued that pesticide legislation at the federal level is needed (at least it's better than the state or, heaven forbid, the local level), Sen. Lieberman and others in Washington D.C., should be more accepting of recommendations from those intimately involved in the green industry.

Sure the Environmental Protection Agency established the Lawn Care Advisory Committee with representation from the lawn care industry as well as from activist groups, but the whole concept has become a farce.

Most recently, the EPA invited industry representatives to provide input on whether the agency should issue pesticide guidelines to the states. Before any discussion took place, however, the EPA had all but decided to issue the guidelines; a decision based not on scientific concern or group consensus. Distribution is now on hold, pending alleged industry input.

Meanwhile, Sen. Lieberman's new draft continues to require all commercial applicators to use written contract, provide notification, provide customers with a list of substances to be applied...that's just for starters. In addition, a chemically sensitive individual may request notification for any application within 800 yards.

To say that all applicators must notify all adjacent neighbors to the property where a pesticide application is going to take place is ludicrous, particularly in rural areas.

The real question here is why is anyone messing around with lawn care legislation when our government should be concentrating on a \$4 trillion deficit. The war on



drugs, gun control, unemployment, housing and so on should take higher priority than the legislation Lieberman has proposed.

It's anybody's guess what Lieberman might do. He has gained considerable clout since Clinton became president (Clinton helped out on Lieberman's attorney general campaign), and he's playing a larger role in the armed services committee and issues surrounding the economy.

There's still talk of spring lawn care hearings, but it seems doubtful that they could be scheduled to coincide with the start of the spring lawn care season.

Many say it's unlikely that a lawn care bill would become law on its own merit, rather it could be attached to other environmental legislation sure to see some movement this year including the SuperFund, Clean Water Act and so forth.

It would serve the industry's best interests if the re-authorization of the Federal Insecticide, Fungicide and Rodenticide Act would gain momentum this year. Since any kind of national preemption legislation falls under FIFRA, it makes sense to keep lawn care regulations pertaining to posting and notification together.

Although some of us would like it to, the issue of lawn care legislation is not going to go away. So be it. But a consistent, national set of laws or regulations isn't too much to ask for and would let all lawn care professionals know what they're dealing with no matter what locale they are doing business in.

Let's get the matter resolved and let lawn care professionals go back to running their businesses without constantly looking over their shoulders. — *Cindy Code* ■

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## TURFGRASS ECOLOGY AND MANAGEMENT

**CHAPTER 1:** Climate, Weather and Turfgrass

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**CHAPTER 3:** Nutrients – Gases and Minerals As Resources

**CHAPTER 4:** Water, As a Resource

**CHAPTER 5:** Physiological Responses to Temperature

**CHAPTER 6:** Soil – The Anchor in Ecology

**CHAPTER 7:** Population Dynamics

**CHAPTER 8:** Intraspecific Competition

**CHAPTER 9:** Interspecific Competition

**CHAPTER 10:** Disturbances . . . Predators

# Business Watch

ON THE U.S. real estate front, the beginning of 1993 brought mostly bad news: Both sales of existing homes and home construction starts dropped sharply in January, after a robust December. Sales of existing single-family homes dropped 6.4 percent, a big turnaround coming on the heels of three consecutive months of unprecedented growth (+10.3 percent in October, +5.2 percent in November and +5.5 percent in December) that had taken existing home sales to an annualized rate of 4.02 million units — the highest point that figure had seen in 13 years. (Existing home sales for 1992 finished officially at 3.5 million, an 8.7 percent jump over 1991, and the fastest pace existing homes have sold over a calendar year since 1988.) Housing starts also took a plunge, dropping 7.2 percent in January (after having jumped +4.8 percent in December) to 1.19 million units — the lowest figure for housing starts since last July. In a recent *USA Today* article, an FNMA official attributed the skid in housing starts to unusually inclement weather over most of the United States in January.

## RETAIL SALES

OCT.	NOV.	DEC.	JAN.
+2.1	-0.1	+0.8	+0.3

\*Percent change from preceeding month.

## FIXED MORTGAGE RATES\*

DEC.	JAN.	FEB.	MAR.
8.02	7.83	7.56	7.20

\*Posted yields on 30-year mortgage commitments for delivery within 30 days.

## SALES OF EXISTING HOMES



Source: The Wall Street Journal

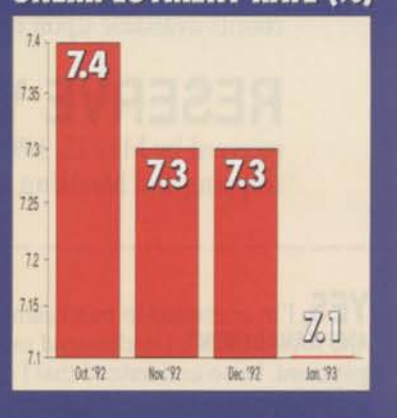
## HOUSING STARTS\*



\*Thousands of homes, seasonally adjusted

Source: Bureau of the Census

## UNEMPLOYMENT RATE (%)



Source: Bureau of Labor Statistics

## ECONOMIC REPORT: PESTICIDE NOTIFICATION

IF THE UNITED States passes federal regulations for posting and prenotification for chemical lawn applications, most contractors interviewed said posting would bear little impact on their businesses financially, but that prenotification could prove burdensome.

A majority of the contractors already post signs after applying chemicals to lawns, and believe benefits offset the minimal costs.

"The average sign for posting costs 5 cents, but the benefits are worth the nickel. It's a great source of advertising," said Dave Soares of Dave Soares Landscaping, Westfield, Mass.

Landmasters Inc., in Gastonia, N.C., doesn't post currently but is considering implementing a program within six months. "There won't be that much of a cost. That part of the business is so small; we only service 300 accounts," said Landmaster's Bill Jeffers.

Andy Mumma of Sunrise Landscape Maintenance, a company in Albuquerque, N.M., which does not post, raised questions about potential lawsuits. "How do you verify you've posted if some kid yanks out the flag? Who's responsible? Our lawyers say that if you don't have many complaints about it you're OK, but what if it's a client that happens to be chemical-sensitive?" he asked.

Some lawn care companies would prefer complying with national posting regulations rather than meeting varying requirements of

several municipalities. "Setting a national standard would be perfect if it means negating all the individual communities' rulings," said Bill Parker, maintenance supervisor for Moore Landscapes, Inc., Glenview, Ill. "I know in some areas cities demand their own specifications for signs. That could be costly and disorganized."

A greater concern, however, hovered around costs incurred by potential federal notification laws. "It depends on whether you're talking about prenotification for everybody within a certain area or just notifying those neighbors that request it," said Brad Culver, owner of Nitro-Green in Helena, Mont. "Comprehensive notification laws would add costs to our services. We would charge the customer."

Stephen Parady, owner of Total Turf Care/Royal Ind., Fort Worth, Texas, believes if posting and notifying are regulated nationally, the laws should apply to homeowners as well as professional lawn care applicators. "Only 30 percent of home owners have their lawns cared for professionally," he said. "What about the other 70 percent that take care of their own lawns? There's a lot of misuse of pesticides out there."

Mumma said prenotification would mean adding another staff person to handle the paperwork at his company, but Culver said his costs would not increase.

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USE READER SERVICE #87

## Compost Salute

Three cheers for LLM. Thank you very much on behalf of DK Recycling and associated companies for publishing your market report on composting. The more exposure we can get for compost, the more landscapers, etc., will become accustomed to the idea of compost in horticulture.

We are doing everything we can to encourage compost use in our markets in Chicago, St. Louis, Indianapolis and Atlanta, but our efforts go much farther with promotional support from respected trade magazines like yours.

Charles Pick  
DK Recycling Systems  
Lake Bluff, Ill.



## Hispanic Position

I'm compelled to comment on the article, "Habla Espanol?" that appeared in your October issue. The article was in regard to the growing number of hispanic workers in the landscape industry.

In the mid-70s, I was a foreman at a large landscape nursery located in the west suburban area of Chicago. We had seven or eight crews, two of which worked mostly at the nursery (el rancho) digging and preparing plants and trees for the installation crews to take to the job site.

I knew and enjoyed Spanish from school, and spoke Spanish exclusively with my crew. I also seized the opportunity to learn more about the language as well as their culture. Indeed, I admired their "strong work ethic" as was pointed out in the article, and I learned a great deal from these diligent, hard working people.

I remember being appalled by the living conditions at the "Mexican hut" where they all stayed. When I inquired about this I was told that if they (the owners) fixed it up, it would just get trashed anyway. Amazingly, the workers never complained.

The article stated, "Hispanic employees have actually helped recruitment by bringing job-seeking friends and relatives to the firm." Here's how it was at our nursery: Whenever we needed more help, Hector, the leader and boss of all the Hispanic workers, would go down to the "barrio" and immediately get as much help as needed. They would all be "wetbacks" grateful to finally get a job. Not only would Hector make them pay him a fee for getting a job, but they also had to pay the nursery rent for staying in those "deplorable" conditions. All this came out of their wages which at that time was around \$3 per hour, tops.

My experience at that nursery was invaluable, but at the same time revealed the

thriving racket of Hispanic labor. Has it changed that much? Perhaps. I am still interested in knowing if the average laborer "entry wage" of \$5.40 per hour, the average salary for all regions as was stated in another article in the same issue, applies to Hispanics. In that article, "How Much Are you Worth," there was no mention of Hispanics.

Bob Jones  
Landscape Designer & Contractor  
Glen Arbor, Mich.

*Ed. Note: The "Landscape Industry Wage and Benefit Study" published by the Associated Landscape Contractors of America did not break out Hispanic labor from its laborer category.*

## Pesticide Progress?

In response to the pull-out section from RISE in your November issue. Is it any



wonder our industry is under fire when we characterize pesticides as "unsung heroes" in a war against "pests" such as bees and bats? We will make progress when we realize our customers are ed-

ucated and would be motivated by a more responsible approach by industry spokesmen.

John Totten  
Estate Gardener  
Butler, Penn.

Letters to the editor are encouraged. Send them to: Cindy Code, Editor, Lawn & Landscape Maintenance magazine, 4012 Bridge Ave., Cleveland, OH 44113. ■



## NEWS DIGEST

### **Miles Gives R&D Efforts a Boost**

Miles expenditures on research and development will increase to about \$490 million in 1993, up nearly 12 percent from the \$438 million the company spent in 1992.

Miles' R&D spending is concentrated in health care, polymers and coatings, agriculture and imaging technologies.

Four crop protection and specialty products are in the final development phase this year: Folicur, a fungicide; Confidor, an insecticide; Aztec, a corn rootworm insecticide and Merit, a grub control insecticide. Merit is expected to be introduced in 1994.

### **EPA Rejecting Some Pesticide Data**

Nearly 30 percent of all studies being submitted to the Environmental Protection Agency are being rejected under the pesticide re-registration program. The 1988 amendments to the Federal Insecticide, Fungicide and Rodenticide Act require that the agency complete the re-registration process by 1997, but the agency is anticipating that the process could take until 2002 to complete.

### **EPA Agrees To New 2,4-D Label Changes**

The Environmental Protection Agency and a group representing registrants of the herbicide 2,4-D have agreed to label changes rather than suspension of product registrations for failure to submit health and safety data.

The agreement is designed to reduce exposure to 2,4-D, one of the most widely used herbicides in the United States. According to the agreement, an extension was granted for the submission of overdue health and safety data.

See page 97 of this issue for specific label changes.

### **Dillaware Relocates, Consolidates Facilities**

Dillaware Inc. relocated and consolidated its offices to a new facility at 1395 Hwy. 2722, New Braunfels, TX 78132. The company moved its administrative offices from Austin, Texas, to join the sales and shipping divisions already located in New Braunfels. Dillaware's sales line will remain 800/880-0887. The new fax number is 210/899-2124 and the international number is now 210/899-2100.

## **National Notification Bill Still in Limbo**

MORE THAN 100 members attended the Professional Lawn Care Association of America's 4th Annual Legislative Day on the Hill in Washington D.C., hoping to discern and impact lawn care legislation and regulations slated for 1993.

Attendees met with Congress members to discuss public policy issues affecting lawn care. The two-day event opened with the U.S. Chamber of Commerce business rally, at which President Bill Clinton reiterated his three-part plan to restore the nation's economy.

Clinton outlined a \$30 billion stimulus package to strengthen economic recovery; a four-year, \$160 billion investment plan for transportation, technology, energy, environment, rural development and housing; and a \$700 billion deficit reduction package over five years.

"Our system has become too large, too slow, too unresponsive. If this government was a business, it would have gone under a long time ago," Clinton said.

His economic plan included 150 specific budget cuts, particularly ineffective government programs. "This budget says I take responsibility for angering constituents for raising taxes. I will not sign a tax increase until I see those cuts," he said.

He stressed that Superfund remains a major focus for the Environmental Protection Agency.

Later in the day, Steve Johnson, deputy chair of the EPA's Lawn Care Pesticide Advisory Committee, briefed PLCAA members on the committee's areas of concern, including posting and notification, registration and pesticide labeling.

Johnson indicated the EPA may issue state guidelines for pesticide regulations. The EPA's involvement seems to hang on whether or not Sen. Joseph Lieberman, D-Conn., plans to reintroduce his Notification of Chemical Application Act.

PLCAA members that met with Sarah Walzer, Sen. Lieberman's legislative aid, received copy summaries of Lieberman's proposed pesticide bill for 1993. "The draft's not a whole lot different than the last summary of changes we received," said Tom Delaney, PLCAA's director of government affairs.

The proposed bill excludes indoor posting requirements for commercial sites stated in last year's bill, but includes a section that would require lawn care professionals to notify adjacent neighbors of application one time each year. The bill also would mandate manufacturers to alter labeling on pesticides purchased by homeowners to include an explanation of posting requirements.

Lieberman's bill has yet to be finalized. It remains uncertain whether or not public hearings will be held or by which Senate committee.

David Salka of Custom Lawn Care, East Lyme, Conn., pointed out to Walzer that it is sometimes difficult, particularly in rural areas, to determine all adjacent properties. Walzer conceded the point and gave PLCAA members 30 days to respond with other comments.

(continued on page 10)



### **Kees Resumes Product Production**

F.D. Kees Manufacturing Co. finished reorganizing and restructuring its operations and is now producing its 1993 product line.

With new financing and an intensified management team, the company will place an increased emphasis on support for its

distributors and dealers. The restructured management team includes the addition of a director of sales and marketing.

The new management team consists of Mike Schaefer, president; George Schaefer Jr., senior vice president; and Donald Kanter, director of sales and marketing.

Kees' 130,000-square-foot facility in Beatrice, Neb., will continue to produce products under the Kees label.

## Nor-Am's Bendiocarb Suspended In California

The Nor-Am Chemical Co. announced the suspension of the registration of the active ingredient bendiocarb in California.

Bendiocarb, a carbamate insecticide, is the active ingredient in the company's Ficam and Turcam insecticides.

Widely used throughout the United States for application in structural health and turf, Nor-Am made the business decision to discontinue Ficam and Turcam sales due to California's requirement to repeat certain toxicological studies. The voluntary suspension took effect last December.

According to George Raymond, marketing manager for Nor-Am Specialty Products, the decision to halt sales in California was made because it was determined the cost of the studies requested by the state would exceed the value of the Nor-Am products sold in the state.

While present studies used to support the products are considered acceptable by the U.S. Environmental Protection Agency, California officials were insistent that they be repeated. Nor-Am distributors have until Dec. 15, 1994, to sell their inventories, and users will have an indefinite time period to

legally use the products in California. The suspension has no effect on sales of the products in other states.

## Biosys Plans New Biological Agreement

Biosys signed a letter of intent to purchase AgriSense of Fresno, Calif. The acquisition is expected to be completed by the end

of March 1993 and includes the AgriSense European subsidiary, Biological Control Systems.

Both divisions develop and market pheromone-based products for control of pests in high-value crops, retail, cockroach detection and stored products.

AgriSense was formed in 1988 as a joint venture between subsidiaries of Phillips Petroleum Co. and Dow Corning to com-

### News

(continued from page 9)

PLCAA plans to submit written comments and is considering whether or not to introduce its own model bill, according to Delaney. "Everyone seems to be waiting to see what Sen. Lieberman does, or what happens with his bill," he said.

In other areas, Johnson fielded numerous questions regarding the status of 2,4-D. A panel of scientists is reviewing data on the herbicide. Based on their conclusions, the EPA will determine if 2,4-D will undergo special review. In the area of homeowner pesticide requirements, "we're trying to get compliance without enforcement means," he said.

Johnson said the EPA continues to update label practices and plans to finalize its position on certified registration and training this year.

In other issues affecting lawn care, Rep. Tom DeLay of Texas reintroduced the Federal Insecticide, Fungicide and Rodenticide Act which would simply reauthorize the existing laws under that Act. In addition, the Supreme Court recently denied an appeal to revoke the 9th Circuit Court's order for the EPA to use zero-risk standards to regulate carcinogenic pesticides in food. A number of the chemicals being considered are also used on turf.



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mercialize insect detection, monitoring traps and other biological control technologies. These products include Phillips' pheromone synthesis technology which disrupts the mating behavior of insects, and Dow Corning's microencapsulation/slow release technology.

### **Extended Warranty Available from RAC**

A new two-year warranty program for the Cushman Turf-Truckster is available from Ransomes America Corp.

The program applies to retail customers purchasing a new 1992 or 1993 model year Turf-Truckster as well as the Cushman Turf Master Sprayer. For all sales made through May 31, 1993, customers will receive an additional 12 months of free warranty coverage.

The new warranty program is valid only at participating dealer-ships in the United States and Canada. All warranty information must be received by Ransomes America Corp. no later than June 15, 1993.

The firm is also offering free replacement tires for the next five years to buyers of new Cushman and Ryan aerator products. Purchases must be made before May 31.

For more information on the program contact your local dealer or Ransomes America Corp, P.O. Box 82409, Lincoln, NB 68501; 800/228-4444.

### **Browner Hopes To Ease Regulatory Burden**

Industry and environmental concerns can live harmoniously, according to Carol Browner, new administrator of the U.S. Environmental Protection Agency.

There's been a lot of industry discussion about the appointment of Browner to head the EPA. And although what she says in confirmation hearings and what she does in office may be two different things, the following details are what Browner says the public can expect from her.

Most of Browner's ideas are said to be based on the central theme of easing the regulatory burden on business with little or no effect on environmental protection.

To accomplish this, "EPA should promote, encourage and develop rewards for businesses that develop pollution prevention and recycling strategies," Browner said.

Browner suggested using incentives and fees as a way of easing the regulatory burden

on business, a throwback from her days as director of Florida's Department of Environmental Regulation. There she established a coalition of business leaders who implemented an annual fee structure for major sources of air pollution — giving her agency the resources to work with affected businesses.

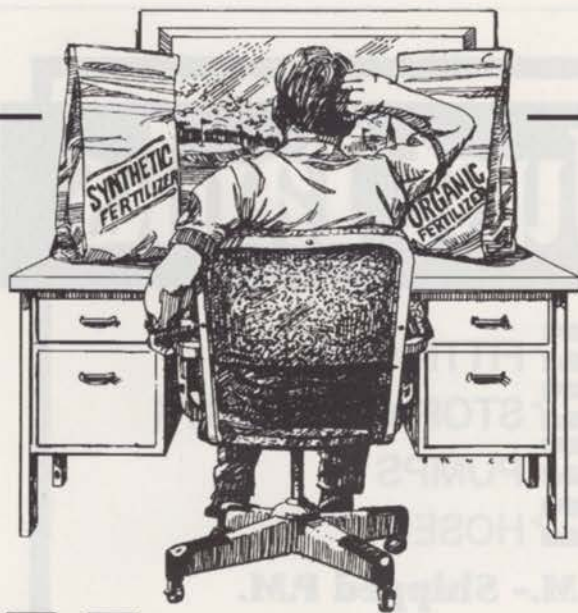
As for the nation, Browner said, the future of environmental protection lies in creating incentives for businesses to prevent pollution.

### **RISE Sponsors Legislative Symposiums**

The Responsible Industry for a Sound Environment will sponsor a Federal Legislative Symposium March 25-26.

Designed to educate Congressional staffers and regulators on the benefits of specialty pesticides, the symposium will include a half-day session in Washington, DC, and tours of Delmarva Power utility and Wildlife International avian and aquatic testing facilities in Maryland.

Additionally, RISE will sponsor several similar symposiums at the state level, including March 30 in Sacramento, Calif., and March 31 in Raleigh, N.C. ■



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# Association News

APRIL IS NATIONAL Lawn Care month, a public relations campaign first promoted by the **Professional Lawn Care Association of America** in 1990 to battle negative hype over pesticides. This year, the association continues to champion a positive industry, confident that its efforts are making an impact.

The establishment of National Lawn Care month coincided with concern over potential adverse reaction to U.S. Senate Hearings on lawn care pesticides and the General Accounting Office's March 1990 report, "Lawn Care Pesticides — Risks Remain Uncertain While Prohibited Safety Claims Continue."

Press releases sent to 2,000 newspapers nationwide one week prior to the Senate hearings and successful radio interviews proved fruitful.

"The first event was a success," said Laura Tener, PLCAA communications director. Several states declared April National Lawn Care Month, but dropped the concept after two years. (Former Gov. Bill Clinton of Arkansas was the first to adopt the program.)

Nevertheless, PLCAA continues to promote National Lawn Care Month, claiming the campaign has steadily increased public

## For more information...



PLCAA  
1000 Johnson Ferry Road N.E.  
Suite C-135  
Marietta, GA 30068  
404/977-5222

ALCA  
12200 Sunrise Valley Dr.  
Suite 150  
Reston, VA 22091  
703/620-6363

GTA  
5198 Ross Rd.  
Acworth, GA 30102  
404/975-4124

AFMS  
c/o U. of Maryland Dept. of Agronomy  
Turf Research and Education Facility  
3120 Gracefield Rd.  
Silver Spring, MD 20904  
301/572-7247

PPGA  
P.O. Box 27517  
Lansing, MI 48909  
517/694-7700

awareness about the lawn care industry.

"We don't sponsor a particular event, but we've sent out press releases to newspapers and magazines across the country and provided public service announcements. We seem to have gotten a lot of coverage," Tener said.







The **Associated Landscape Contractors of America** elected Gary Thornton, chief executive officer of Thornton Gardens Inc., Maineville, Ohio, as its 30th president. The

installation took place at ALCA's Third Annual Executive Forum.

Thornton, also president of Thornton Computer Management Systems, grew up in the family landscape business joining his brother in a partnership in 1963. He has been involved in ALCA almost 25 years, first serving as committee chairman in the early 1980s.

As ALCA's new president, Thornton plans to continue to provide quality education to ALCA members, to promote edu-

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cation and professionalism in the industry, increase association membership and member involvement and spearhead an aggressive public relations campaign.

"The trends I see evolving in ALCA's membership are ones of professionalism within the industry and an increased awareness of the value of landscape from the 'outside world' of our industry," he said.

ALCA also elected Richard Akerman of Northwest Landscape Industries, Tigard, Ore., as president-elect; Terry Anderson of Rentokil Tropical Plants, Riverwoods, Ill., as vice president of finance; and David Minor, Minor's Inc., Fort Worth, Texas, as secretary. Rick Doesburg of Thornton Gardens was installed as landscape division chairman.

The **Georgia Turfgrass Association** and the **Georgia Turfgrass Foundation Trust** appointed Douglas Moody as executive director of both organizations. Moody replaces Sarah Bundschuh, who resigned to work on professional education and training in conjunction with the GTA.

Moody, president of Moody Management and Marketing Services, served as deputy executive director for the Professional Lawn Care Association of America for six years,

and director and vice president for the New Jersey Turfgrass Association.

The **American Floral Meadow Society** recently formed to develop and improve wildflower and grass groundcover plantings for ornamental and low-maintenance uses.

The society plans to conduct research on wildflower and grass species, mixture formulations and methods of maintenance.

"There is no national professional organization dedicated to that purpose, and it is hoped that the AFMS will eventually become not only a unifying force in the field of low-maintenance wildflower plantings, but also a significant vehicle for technical information exchange," said John Krouse, secretary of AFMS.

The society is seeking individual and organization members. Cost for individual membership is temporarily \$10; organizational membership is \$25.

The **Professional Plant Growers Association** offers three short videos to teach how to increase sales of bedding plants.

"Blooming Profits" and "Flowering Plants" 15-minute videos train employees how to maintain and sell healthy plants. Each covers pre-booking orders, stages of

blooms for sale, shipping conditions, unpacking instructions, watering techniques, display and maintenance, regrouping and removal of plants past their prime as well as printed information and tie-in merchandising.

"Success With Bedding Plants" runs 20 minutes and covers soil preparations — removing existing growth; pretreating for insects and disease; incorporating organic matter to improve moisture retention and drainage; and selecting, installing and maintaining plants.

Blooming Profits and Flowering Plants are \$39.95 each; Success with Bedding Plants costs \$100 for PPGA members; \$130 for non-members.

**IN BRIEF:** The **California Association of Nurserymen**, Sacramento, offers "Planting Seeds, Growing Minds," a horticultural curriculum for kindergarten through sixth grade. The curriculum costs \$5 and includes 11 science lessons and other hands-on activities...The **American Sod Producers Association** published a 20-page booklet, "Healthy Lawn — Healthy Environment, Caring for Your Lawn in an Environmentally Friendly Way." Developed by the Environmental Protection Agency, the booklet is available through ASPA, 708/705-9898. ■

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USE READER SERVICE #40

# Landscape News

## RECYCLING GRASS CLIPPINGS SAVES MONEY, TIME, LABOR

SOME CLAIM THE impetus for recycling grass clippings involves saving the environment, but communities latching onto the Professional Lawn Care Association of America's grasscycling program are also saving money, and liking it.

PLCAA's campaign began in early 1990 in response to concerns that yard waste, to which the industry contributes extensively, was taking up valuable landfill space. Lawn debris constitutes about 20 percent of all waste dumped in landfills, and grass clippings make up half of that, according to PLCAA. Twenty-seven states and Washington, D.C., plan to ban some degree of yard waste from landfills by 1996.

"PLCAA thought the program would be a good, positive image-builder for the industry, while helping educate the public on recycling and relieve the landfill crisis," said Bob Tracinski, a PLCAA spokesman and division manager of media relations for Deere & Co., Raleigh, N.C.

The association steers communities in

### RECOMMENDED MOWING HEIGHTS FOR VARIOUS TYPES OF GRASS

Kentucky Bluegrass	3.0 inches
Fescues and Ryegrass	3.0
Bentgrass	1.0
Bermudagrass	1.0 - 1.5
Zoysiagrass	1.0 - 1.5
St. Augustine	3.0
Bahiagrass	3.0
Centipede grass	1.5

developing and promoting action programs and provides technical guidelines for mowing, watering and fertilization. Its 24-page brochure, *Grasscycling: Community Action Plan*, outlines a seven-step

guide for creating public education programs, and includes text for news releases and radio and television public service announcements.

(continued on page 21)

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Introducing the new Gator 6x4 and 4x2 from John Deere. The only utility vehicles

made today for both on-turf and off-road work.

These two Gators do have their differences. The 6x4 (six wheels, four-wheel drive) is powered by an 18-hp, liquid-cooled V-Twin engine.

As for the 4x2 (four wheels, two-wheel drive), its power comes from a rugged 10-hp, air-cooled engine.

But it's what the Gators share that sets them apart from the rest.

Stability, even in uncertain times. Besides a low center of gravity, the Gators feature an off-set operator's seat for better balance. Three turns lock-to-lock steering for precise maneuvering.





# and 4x2 from John Deere

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Right next to stability is durability. Like their namesake, the Gators are rugged, inside and out. On the inside are wet-disk brakes, a heavy-duty transaxle, and an

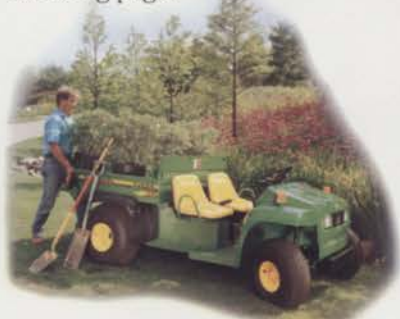
arc-welded frame with unibody construction.

On the outside, you'll notice the fully-independent front suspension, forged rear-axle housings, and the quality, ribbed-box construction.

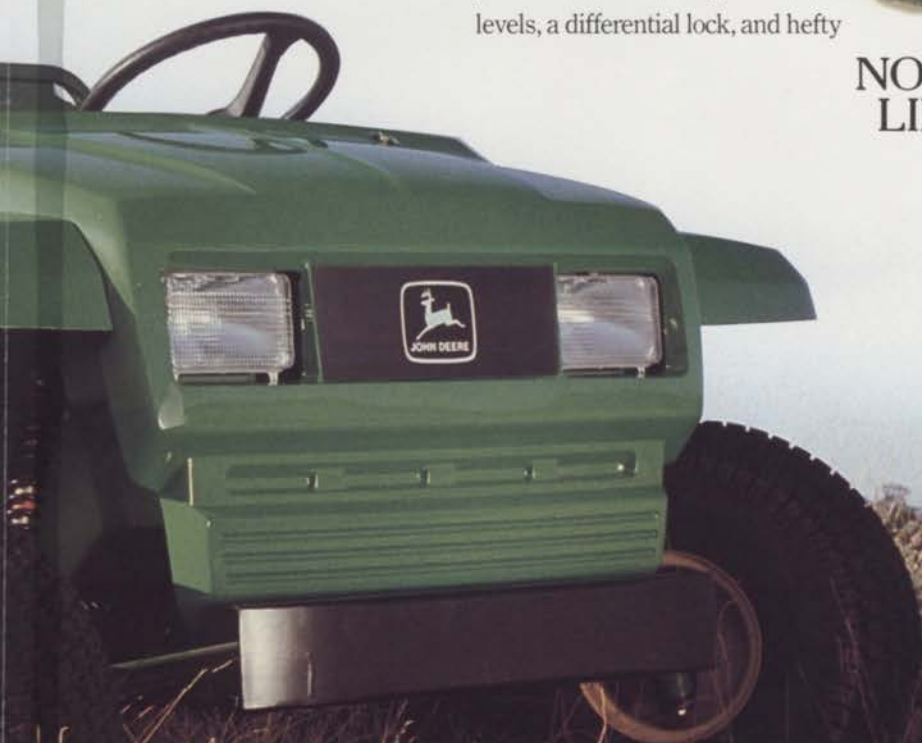
But it's in the performance category where the Gators truly dominate. With the lowest ground pressure in the industry, low sound levels, a differential lock, and hefty

payload and towing capacities.

Their numbers are even more impressive, as you'll see on the following page.



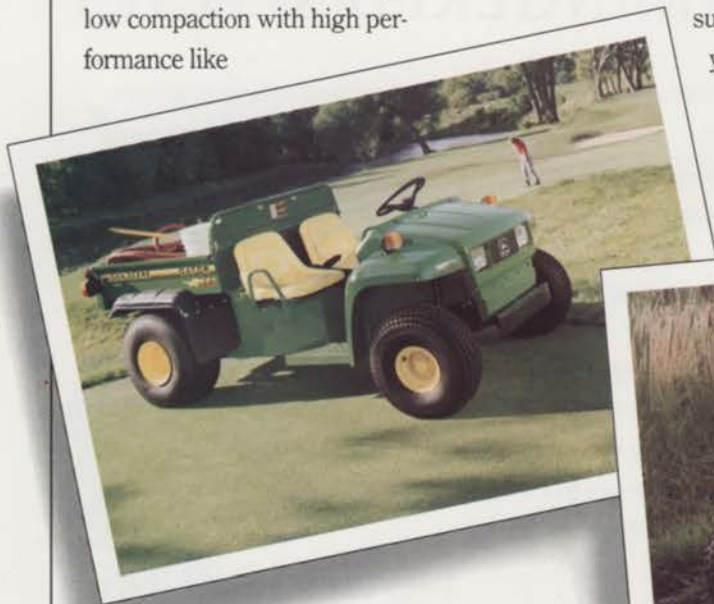
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Lubrication	Full pressure	Full pressure
Cooling system	Air	Liquid
<b>Fuel system</b>		
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Differential lock	Standard; hand operated	Standard; hand operated
Ground speed	0-15.5 mph (0-25 km/h)	0-15.5 mph (0-25 km/h)
Transaxle	Fully enclosed; oil bath	Fully enclosed; oil bath
Brakes	Wet-disk in transaxle	Wet-disk in transaxle
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<b>Ground pressure, max.</b>		
With 200 lb. operator only	5.6 psi (.39 kg/cm <sup>2</sup> )	6.9 psi (.49 kg/cm <sup>2</sup> )
Fully loaded vehicle	7.5 psi (.53 kg/cm <sup>2</sup> )	7.1 psi (.50 kg/cm <sup>2</sup> )
<b>Dimensions</b>		
Length (without bumper)	99.6 in. (253 cm)	103.9 in. (264 cm)
Length (with bumper)	100.2 in. (255 cm)	104.5 in. (266 cm)
Width	59.8 in. (152 cm)	59.8 in. (152 cm)
Height (overall)	43.6 in. (111 cm)	43.6 in. (111 cm)
Weight (incl. fuel/fluids)	800 lb. (364 kg)	1015 lb. (457 kg)
Payload capacity (including 200 lb. operator)	900 lb. (408 kg)	1200 lb. (544 kg)
Turn clearance circle	22 ft. (6.7 m)	24.8 ft. (7.6 m)

(Specifications and design subject to change without notice.)



**NOTHING RUNS  
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## Landscape News

(continued from page 16)

A number of PLCAA members contribute to developing their communities' programs, Tracinski said. He could not estimate how many.

It's difficult to determine how many communities have adopted the program, but about 1,500 companies, states, cities and individuals have requested information. Germantown, Tenn., one of the first communities to test the program, estimates it saved \$10,000 the first year in hauling, landfill and labor costs. The city plans to expand the program this year, possibly setting up a reimbursement plan for residents who buy mulching mowers.

Even in communities like Germantown and Salt Lake City, Utah, where residents willingly embrace the grasscycling concept, it's necessary to dispel myths that clippings create thatch, Tracinski said. "Some homeowners worry about a buildup of thatch, but thatch is mostly dead grass roots. Clippings decompose without adding (significantly) to thatch."

An 11-year study at the U.S. research station in Beltsville, Md., found that

returning clippings contributes only 0.03 inch to the thatch layer each year. A half-inch layer of thatch helps hold moisture in the soil and cushions the ground to help

**Greenfield's  
'Don't Bag It'  
program cost  
about \$40,000 and  
diverted  
more than  
101 tons of  
grass clippings  
from landfills.**

prevent soil compaction. But a thick layer of thatch can act like a sheet of plastic to block the movement of air, water and nutrients to the lawn's root system.

"Anything that creates a shallow root

system also causes a thatch buildup," Tracinski said. "That includes scalping when mowing, and watering too lightly."

Some communities not drawn by PLCAA's campaign are implementing similar programs. Greenfield, Wis., for example, adopted a Don't Bag It Lawn Care Plan developed in conjunction with BFI Town & Country Waste Service. Based on a prototype designed for Fort Worth, Texas, the project encouraged 52 homeowners to recycle grass clippings using Toro Recycler mowers and a slow-growth fertilizer provided by Howard Johnson's Enterprises of Milwaukee.

The Don't Bag It program cost about \$40,000 and diverted more than 101 tons of grass clippings from landfills, said Keven Klopp, Greenfield's recycling coordinator. The city estimates it saved about \$2,800 in hauling costs.

Fifty-seven percent of participants responding to a follow-up survey said their lawns improved during the program. Another 40 percent said they saw no change and 8 percent reported diminished quality. In addition, 15 participants reported saving nine hours of mowing each, while four said mowing took longer. ■

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USE READER SERVICE #71

USE READER SERVICE #86

# Franchising the Entrepreneurial Spirit

*Now in its 25th year as a franchise-based company, Lawn Doctor continues to seek new markets for expansion.*

*By Julie A. Evans*

GROWING UP in a blue-collar Philadelphia neighborhood, Russell Frith never dreamed he would some day be the CEO of one of the nation's most respected franchises.

"There wasn't that expectation of getting a 'good' job," he said. "Nobody talked about it. People focused on getting an honest job. I never planned to do this, and I never had any kind of scheme."

Now president and CEO of Lawn Doctor Inc., Matawan, N.J., Frith finds the top spot can be a little unnerving at times.

"Sometimes it's a very scary place if you take your job seriously, and if you care about people and recognize that your decisions can have a significant impact on others. That's a lot of responsibility," he said.

Frith, 49, joined Lawn Doctor in 1978 as director of marketing. He quickly climbed the

corporate ladder to vice president and executive vice president, before advancing to president in 1983. Under Frith's leadership, Lawn Doctor has grown to a record-high 290 franchises in 33 states, with estimated 1992 sales of more than \$30 million.

Frith is modest about his achievements. "Looking back, I did the best possible job I could with the assignment I had," he said. "I see so many people in life who say they're going to do this at 21, do that at 23 and so on. I think that approach makes for very unhappy people.

"When I came to the company, I just continued to do what I've always done — a good job at what I was supposed to be doing."

Now in its 25th year as a franchise-based company, Lawn Doctor continues to seek new markets for expanding its lawn care business which, for the last eight or so years, has emphasized an integrated pest management approach to fertilization and weed control. The company expects to be a more aggressive franchisor in the coming years, following a short period of deliberate slowdown, Frith said.

"For a period of time, we didn't look to go outside of the areas we were in," he said. "We wanted to increase our staff level to support growth. We've done that, so now we are moving more into a growth mode."

**HISTORY.** Like Frith, Lawn Doctor wasn't looking for success. Success found Lawn Doctor. Nearly 30 years ago, hardware store owner Tony Giordano and his friend Robert Magda opened a lawn care business in Matawan, N.J., in response to customer demand.

"Tony owned the store and I worked there part time on weekends as a friend," Magda said. "We saw how business was developing in the area, with people moving out to the suburbs from New York City. They wanted to maintain their lawns, but generally had no knowledge of how to do it."

"Customers would come into the store, buy products, put them down improperly and do more damage than good to their lawns," he said.

Giordano began conducting lawn care classes



Robert Magda (left) and Russ Frith are a big reason why the Lawn Doctor organization continually ranks first in lawn care franchising. Photo: Jeff Martin



from his store, but it soon became apparent that customers would pay for Giordano to provide the lawn service.

In 1964, Giordano and Magda formed a partnership and opened Auto-Lawn of America. Magda, then a tool-and-die maker, had a

knack for equipment manufacturing. Dissatisfied with the lawn maintenance equipment available on the market, he designed and patented a tractor-combine that aerated, rolled seed and dispensed products to the lawn.

The tractor-combine provided

the basis for a franchisable business, beginning in 1967 when the company incorporated as Lawn Doctor, Magda said. Franchising offered a means of increasing the equipment's distribution without the capital outlay required of company-owned branch offices.

Giordano, who was Frith's predecessor as president and CEO, passed away in 1978. Magda is now vice president of manufacturing, research and development.

"Bob Magda is probably one of the most brilliant people I've ever encountered in this industry," Frith

## LAWN DOCTOR

**HEADQUARTERS:** Matawan, N.J.

**FRANCHISES:** 290 in 33 states

**FOUNDED:** 1964 by Tony Giordano and Robert Magda

**OWNERS:** Privately held

**PRIMARY SERVICES:** Fertilization, weed control, core aerating, seeding, pH balancing, foundation planning and ornamental services

**EMPLOYEES:** 85-90 (company-related); 2,000 (franchise-related)

**1992 SALES:** More than \$30 million

## EXECUTIVE SUMMARY

**THE CONCEPT:** Provide integrated pest management; offer all-natural lawn care alternatives; manufacture products and equipment (for franchisees only).

**PROJECTIONS:** 7 percent growth in 1993

**DISTINCTIONS:** Rated number one in lawn care franchising for last nine years by *Entrepreneur* magazine; ranked in top 100 business opportunities for minorities by *Black Enterprise* magazine; ranked in top 100 franchise opportunities for women by *Women's Enterprise* magazine

## THE CEO

**RUSSELL FRITH**

**AGE:** 49

**FAMILY:** Married, two sons

**EDUCATION:** B.S. in accounting and marketing, LaSalle University, Philadelphia

**LAST JOB HELD:** Executive vice president for Lawn Doctor

said. "He has the ability to look at lawn problems, available products and equipment and put them all in harmony. I've never seen anybody with that kind of talent to the degree that he has it."

Today, Magda oversees a 21,000-square-foot manufacturing plant in Marlboro, N.J., where the company's Turf Tamer and seeder are produced. The Turf Tamer is Lawn Doctor's patented applicator that delivers liquid and granular products to the turf.

As a 30-year veteran of the lawn care industry, Magda said he's seen a dramatic shift in how lawn care firms compete for new accounts. Whereas they once struggled to wrest customers away from the do-it-yourself market, businesses today engage in "high competition and low-ball pricing."

"People (in lawn care) today try to steal customers away from each other rather than attacking the DIY market," he said.

Lawn Doctor remains active in pursuing the DIY market, and keeps abreast of the competition, he added. "We try to keep pricing



competitive; otherwise, we would get eaten up."

Besides Magda, other key play-

ers on the Lawn Doctor management team include: Hal Zeve, director of retail marketing; Ed Reid,

Lawn Doctor does not sell, but leases equipment to its franchisees on a capital recovery basis.

director of franchise sales; Ewald Altstadt, director of operations; John Buechner, director of technical services; and David Stokhamer, controller.

**MARKET CONDITIONS.** 1992 was not a very good year for Lawn Doctor. Sales rose only 1 percent to 1.5 percent from the previous year. But Frith said that given the overall state of the economy, he's not displeased with last year's performance.

"In 1992, the entire industry was slow. The weather was awful. I don't know of anyone, net of acquisitions, who had any kind of growth in their mature areas."

He said he is cautiously optimistic about 1993, projecting 7 percent growth. The company continues to invest in research and development and soon will unveil a new proprietary business software.

In addition, the company is con-



## Some tools require a lot of time and manpower ...

sidering five lawn care "elements" in which it is not currently active. Frith declined to name those potential new offerings, but said more intensive R & D will begin soon for at least one of them. New products and equipment are tested in Bucks County, Pa., at Lawn Doctor's only company-owned operation.

Lawn Doctor does not sell its equipment, rather the firm leases it to franchisees only on a capital recover basis. "The equipment is not a profit center. We retain ownership to protect the proprietary nature of the product," he explained.

**SELLING IPM.** All Lawn Doctor franchisees emphasize an integrated pest management approach to their customers. "We don't want to use any pesticides unless it's necessary," Frith said.

In January 1992, Lawn Doctor added a natural lawn care program to its service offerings. Now, customers at 90 percent of the franchisees are offered three options: Full Need Maintainer Care, the company's regular integrated pest

management approach; All-Natural Fertilization Care, an all-natural fertilizer application with no weed, insect or disease controls; and Natural-Plus Care, a program that combines all-natural granular fertilizers with spot treatments of dandelion and broadleaf weed control. The third option is the most costly; it costs about 23 percent more than the regular program.

Frith said the all-natural lawn care program is going "just as predicted," accounting for about 3 percent of total sales. Despite the low consumer interest, the option lets customers decide whether natural lawn care is the best approach.

"We're being responsive to what we perceived as an unfilled need in the marketplace," Frith said. "Also, we felt there were some

companies misleading customers about organics."

This spring, Lawn Doctor is prepared for what has come to be known as the annual "lawn care scare," when consumer publications warn readers about the perceived hazards of pesticides.

"First and foremost, we support the Professional Lawn Care Association of America with both financial and human resources," said Frith, who is a past president. "PLCAA has done an effective job as a spokesperson for our industry in giving the other side of the story."

Thanks to PLCAA's efforts, responsible journalism prevailed in most articles last year, he added. "We are now able to place our story side by side with someone who puts us in a negative light."

Frith said Lawn Doctor has adopted a proactive stance, as well. For starters, customers are provided with an information brochure on lawn care benefits from the Environmental Protection Agency. Company representatives also visit garden clubs and take advantage

## IS YOUR BUSINESS FRANCHISABLE?

FRANCHISING HOLDS great appeal for small companies eager to expand. Before going the franchise route, consider the following questions:

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- Can potential franchisees afford the initial investment?
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- Can you train others to operate a business like yours?

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of any opportunities to talk about the benefits of properly maintained turf.

Frith also shares his views as a member of an EPA advisory committee. The committee was formed under federal charter to bring together diverse groups of people with an interest in lawn care to discuss issues and help EPA form policies. Well-known lawn pesticide foe Jay Feldmann, national coordinator of the National Coalition Against the Misuse of Pesticides, is also on the committee.

"I think there's been some good dialogue and a better understanding of what each person's issues are," he said. "But the nature of the group

is such that there is never going to be agreement."

**FRANCHISE SUCCESS.** Frith is active in the franchise community. He was recently elected treasurer of the International Franchise Association, and has worked diligently to promote women and minority opportunities in franchising.

His fruitful efforts have not gone unnoticed. For the past nine years, *Entrepreneur* magazine has ranked Lawn Doctor first in the category of lawn care franchising. The company was also ranked in the top 100 business opportuni-

ties for minorities in the United States by *Black Enterprise* magazine; and in the top 100 franchise opportunities for women by *Women's Enterprise* magazine.

With that track record, it's no surprise that Lawn Doctor franchises have such a high success rate, even by franchise standards.

According to Frith, only 2 percent of Lawn Doctor franchises fail each year. (About 10 percent of all franchises fail on an annual basis, compared to 50 percent of all start-up businesses). Franchisees are typically more committed and motivated than employees, Frith explained.

"The entrepreneurial spirit is very difficult, if not almost impossible, to duplicate with company-owned operations," he said.

"One of the huge advantages in a franchise system is having hundreds of owners thinking and acting like owners. There is a higher level of vesting in the business."

Lawn Doctor provides its new franchisees with a two-year program of extra training and support, but education continues throughout a franchisee's career. "We probably conduct several hundred meetings a year, around the country, on sales, service and marketing strategies."

The company also sends weekly mailings and initiates a phone call every week to each franchisee. As Frith noted, it's in Lawn Doctor's best interest to make sure that franchisees succeed.

"We're in tune with the marketplace," he said. "I would say our strongest positioning statement is that we are principally a local person doing business locally. But customers know that advice and resources are available from the parent company."

Frith waxes philosophical about the advantages of a franchise system. "I'm a capitalist. I think capitalism and the extension of ownership of small business is a fundamental thing we need to continue in the United States. It falls into ma and pa, apple pie and the ability to own your own home," he said.

"I think franchising is the last bastion of capitalism, in that the likelihood of success is so much greater. Franchisors, if they are legitimate, can provide all the things someone starting out today wouldn't have the ability to do. Compliance with laws and regulations has become so overbearing — that's why the failure rate is so high for independent business. We need to continue to provide people with the opportunity to succeed."

In the following question and answer session, Frith offers expert advice to would-be franchisors and franchisees.

**Q:** Why should a company consider franchising its business?

**A:** Every way you approach the market has its advantages and disadvantages. Franchising gives you the ability to grow a distribution network without the corresponding resource requirements that someone would have to out-

(continued on page 28)

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Post Properties, Inc., headquartered in Atlanta, is the premier developer and manager of garden apartment communities totaling some 16,000 units throughout the Southeast. Characteristically their landscaped areas are 35% turfgrass; and 65% ornamental plantings, flower beds, jogging trails, recreation facilities and water.

"Cosmetic image is vital to our success," says John Hooks, senior vice president of Post, "but it puts a strain on maintenance costs." Hooks goes on to say that edging turf adjacent to amenity areas with a mechanical edger can take as much time as mowing the rest of the turf.

"This is what got us started experimenting with mefluidide," says Hooks, "and we have found that, by using *Embark Lite*, our original edging schedule of once every two weeks can be reduced to every four to six weeks with absolutely no discoloration problems.

"Subsequently, we have found countless ways to use *Embark Lite*," continues Hooks. "Including broadcasting on tall fescue to reduce the cost of mowing. And, interestingly, our expertise with *Embark Lite* has been very valuable to us in our program of branching out into the maintenance of properties other than those owned by Post."

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FINE TURF REGULATOR

USE READER SERVICE #15

768-12/92

## Cover Story

(continued from page 26)

lay if they were opening all company stores.

If a company were going to open a branch office, that branch might cost \$50,000 to open and start up. But the company could only open the branch if it had \$50,000.

If you license a franchisee, (the franchisee) is using his capital to put (the business) in place. That's the advantage.

But the disadvantage is that when you go the franchise route, you're getting a small percentage of the business that's being done; whereas

if the business is company-owned, (revenues) are flowing through the company coffers. So there are tradeoffs.

Another advantage and disadvantage: Depending on how it plays, in a franchise operation, there is an additional level of management impacting the decision making. When you come up with a new marketing or strategic position, you have to sell or present the strategy and justify it. So the disadvantage is that (decision making) can be cumbersome and take a lot of time.

The advantage: Now you have all these people looking at the program in a critical way. These

are highly vested individuals looking at what we want to do. The result is a much higher confidence level among stakeholders with vested interests.

**Q:** What other factors should a franchisor consider?

**A:** They should keep in mind that they are not going to have the degree of control there is in owning the business outright.

**Q:** What is the appeal of a Lawn Doctor franchise?

**A:** As compared to many other franchise opportunities, it's competitively priced. The total cost of getting into business, including everything — equipment, supplies, training — is \$40,000. And we can cause better than half of that to be financed. We must provide every tool available to ensure the franchisees' success because we are financially vested.

**Q:** How quickly can franchisees recoup their investment?

**A:** We've had people who have made almost what they've invested in the first year. Some people make it work better than others. I'm not trying to shift the burden of responsibility, but what determines success is not the tools of the craftsman but the skills in using those tools.

**Q:** What if someone is interested in becoming a franchisee? What kinds of things should be investigated in a prospective franchise?

**A:** The first thing that someone ought to do is inquire of a franchisor's existing franchisees. Ask them about the business.

Second, are they a member of IFA? The IFA has a strong code of ethics. Call them and ask for their publications.

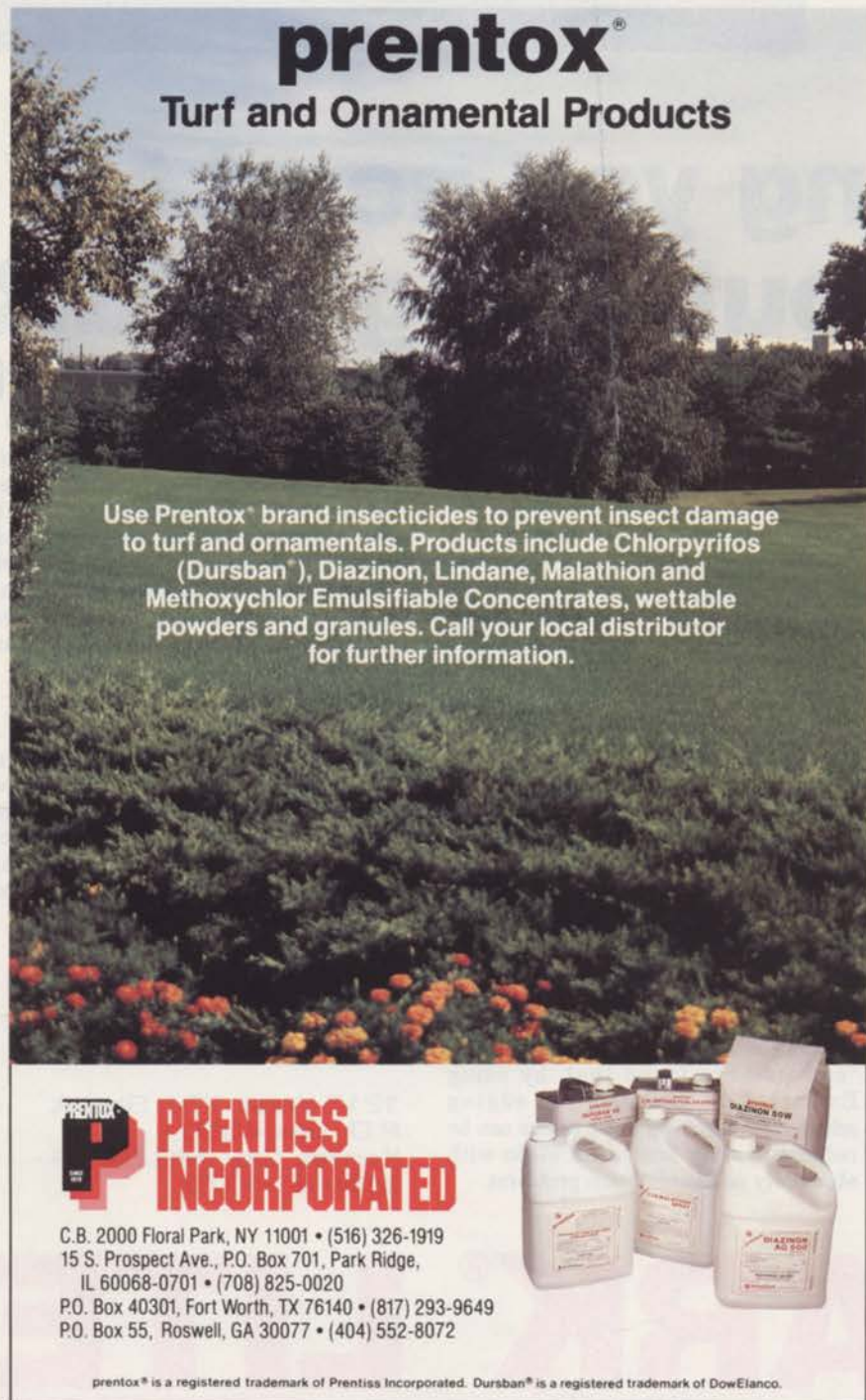
If the franchise still seems interesting, the prospective franchisee ought to visit the company and ask for a Uniform Franchise Offering Circular, required by the Federal Trade Commission. That covers about 20 areas of business including background, officers and key owners, financial statements and litigation history.

It also makes good sense to talk with a respected financial advisor.

**Q:** What do you like best about your job?

**A:** I'm a merchandiser by heart. I like to be a part of the creation of ideas that work. If you were to ask me, what was the one thing that I would like to leave behind, it would be that people view us as being a successful, legitimate business; and that we've conducted our business with honesty and integrity. ■

*The author is a contributing editor to Lawn & Landscape Maintenance magazine based in Lakewood, Ohio.*



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# Pesticides: Ruled By Fact or Fear?

*Opponents and advocates of pesticide regulation wield powerful evidence supporting their positions on potential health risks or specialty chemicals. But industry experts claim laws are based on emotions, not evidence.*

By Cathy Hoehn

**AS WITH ANY** issue concerning potential health hazards, pesticides continually incite laborious debate over their potential risks and benefits. Extremists on both sides hold strong convictions regarding how to regulate pesticides and on what basis.

The U.S. Environmental Protection Agency, as designated by the Federal Insecticide, Fungicide and Rodenticide Act, faces the unenviable task of serving as a balance scale, weighing data on both sides and trying to effect some resolution that protects public health and preserves the lawn care industry.

"There are those who believe lawn care pesticides are not an issue, and they don't know why we even need a committee to study these issues," said Steve Johnson, deputy chair of the EPA's Lawn Care Advisory Committee. "There are others representing environmental groups that believe the Agency can't act quickly enough."

On one side, activists, concerned about potential health risks to pets, humans and wildlife, believe laboratory research data and testimony of victims claiming illness due to pesticide exposure provide irrefutable proof that certain pesticides cause cancer and other health hazards. Advocates of pesticide use, on the other hand, claim no concrete evidence exists linking pesticides, particularly 2,4-D, to cancer.

If those opposed to regulation don't buy claims that pesticides



pose serious health risks, to what, then, do they attribute the banning of pesticides?

"Fear of the unknown," said Dr. George Carlo, epidemiologist and adviser to the Industry Task Force on 2,4-D Research data. Little was known about cancer when the 1957 Delaney Clause amending the Federal Food, Drug and Cosmetic Act sought to ban substances known to induce cancer. "So anything shown to cause cancer in animals was assumed to

cause cancer in humans," Carlo said.

These days, "in most cases we know more than we don't know," he said. Yet regulations governing pesticides continue to be "based not on knowledge of what we know, but on fear of what we don't know. That philosophical approach is inappropriate today."

Instead of basing regulations on the question of what is safe, "we should identify what is dangerous, then effectuate primary,

Although the industry is getting better at educating its customers, specialty pesticides continue to create controversy. Photo: Monsanto

secondary and tertiary solutions. This is standard public health operating procedure," Carlo said. "When dealing with fear of the unknown, you can have too much data. Society needs to quit asking what is safe and ask instead what the public health consequences are."

**CONFLICTING EVIDENCE.** In most issues dealing with opposing viewpoints, a resolution evolves from the analysis of facts. In the instance of pesticides, however, the facts seem to confuse rather than clarify.

Environmental activists quote medical professionals and experts to back their claims that pesticide exposure causes health problems. Dr. Samuel Epstein, professor of occupational and environmental medicine at the school of public health, University of Illinois, claims that 10 of 34 pesticides commonly used for professional lawn care treatment are known to induce cancer in rodents.

Epstein also maintains that 2,4-D, a component of Agent Orange, has been confirmed as a human carcinogen in occupational studies undertaken by the National Cancer Institute, and that recent studies demonstrated major excesses of lymphomas in

## RANKING RISKS

dogs living in homes where the gardens receive regular treatment.

In response to these views, pesticide advocates point to experts such as Carlo who claim there isn't substantial evidence to label 2,4-D a carcinogen.

More than 45,000 articles have been written about 2,4-D since 1960, and 96 epidemiological studies conducted worldwide. Peer review is complete and comments indicate there's no support of the notion that 2,4-D causes cancer, Carlo said.

"Research about 2,4-D shows 4 to 5 percent on the skin is absorbed," he said. "Inhalation is not a major route of exposure. Its half-life is short. In 18 to 20 hours, half is gone (vs. seven to 12 years for Dioxin.) It's not metabolized to any appreciable degree. The body recognizes it as foreign, and most of it comes back out. There's no evidence of chromosomal damage, and it has not been shown to cause cancer in animals."

2,4-D, once the most widely used herbicide in the world, continues to undergo re-registration. Used since the 1940s, it works by blocking nutritional receptors in broadleaf plants.

Diazinon also has come under attack. A neurotoxic pesticide, diazinon was banned on golf courses by the EPA in 1987 after birds allegedly died from ingesting the chemical. The EPA permits continued use of the product for lawn application. It has nearly completed re-registration.

Kim Hill, a Lyndhurst, Ohio-based spokesman for the Sierra Club and Earth Day Coalition, said a number of court decisions favoring alleged victims of pesticide exposure helps strengthen his position against pesticides. In 1988, for example, a federal jury awarded a Philadelphia woman \$67,000 after she claimed illness caused by lawn chemicals. In another case, a Michigan mail carrier was awarded \$1 million for health damage after being accidentally sprayed by a lawn applicator.



Decision Research ranked potential hazards in terms of actual risk involved.



Although a handful of people have successfully sued lawn care companies or chemical companies for health risks attached to their products, a greater number have lost or settled out of court.

Based on these and similar cases, however, Hill believes the EPA failed in its duty of reviewing pesticides already banned. "Past history shows danger of the current EPA's approach to toxic materials. DDT, PCBs, asbestos and chlordane...poisoned millions

of Americans before scientific researchers eventually gathered enough evidence to have them banned."

**CLAIMING A BAD RAP.** Pesticide manufacturers blame environmental activists, media hype — particularly at the local level — and misuse for public misconceptions about pesticides.

"The public picked up various perceptions from the media that pesticides are bad," said William

Culpepper, chairman of the Responsible Industry for a Sound Environment and director of DowElanco's government, industry and public affairs. "After the Alar scare, the public said 'We're kind of afraid of pesticides.'"

The industry must combat the lack of knowledge with education, he said. "The key to survival is education about our products, which are misunderstood by the people who benefit from them. We may have done ourselves a disservice by not talking on the consumer's terms."

In Culpepper's view, the industry has thus far failed to impart basic facts about testing and research. For example, few consumers know it takes about seven to 10 years of research development before a product is brought to market. Other little-known facts include: Each new product has to undergo a battery of about 120 tests; only one in 120,000 compounds ever makes it to market; and the pesticide industry is second only to pharmaceuticals in the degree of regulation. Such facts can make consumers "more comfortable with our products," Culpepper said.

Some people mistakenly believe that products are used for aesthetic improvements only. Others believe weeds and pests can be controlled by nature, added Susan Drake, manager of public affairs for Monsanto's Roundup.

"There's a belief that some sort of natural equilibrium out there can control weed and insect problems," explained Drake. "The theory is somewhat compelling with insect control, but not with weed control."

**JUST THE FACTS.** Public education to set pesticide records straight is becoming standard practice throughout the industry, thanks largely to RISE, an organization which serves to "help the public understand why we use certain pesticides," said Allen James, executive director. "People hear about chemicals that are considered carcinogenic and they auto-

matically think pesticides cause cancer because they are chemicals. It's guilt by association."

RISE promotes education programs for policy makers on state and local levels as well. "More and more states are passing legislative rules beyond reason for the protection of citizens," James said. "We look at whether the legislation is reasonable, needed or appropriate."

On the municipal level, tracking legislation proves a difficult task, James said. "Sometimes we don't hear about ordinances until it's too late to do anything about them." In addition, "local rules are often based on emotion vs. science. When we learn about proposed ordinances, we try to bring some judgment to them and establish what practicality there should be." James encourages lawn care professionals to carry that education to their own employees. "It's important they be aware that the job is more than going to a lawn and treating it," he said. "They have to make sure the homeowner has all the information about the

products they're using."

Bruce McQuay of Maintain Inc., Fort Worth, Texas, said his company's clients haven't expressed much concern regarding pesticide use. "In our system, we pass out information to clients, tell them what pesticides we will be using, what they are, how they work, how much we will be applying."

Clients at government job sites most often request a lawn care program limiting or excluding pesticide use, said Richard Wills, vice president of Landscape Systems, Ontario, Calif. "People on government property are more likely to sue. So governments feel if there's anything else they can use to avoid concerns that might crop up, they'll try it."

Conversely, Walter Barrows of Landscapes by Barrows in Santa Barbara, Calif., claims most of his clients are concerned about health risks posed by pesticides. He blames the industry for the lack of public awareness.

"Our industry is clearly at fault. We're the ones taking the public's

money for our services. They shouldn't be responsible for our actions," he said.

Barrows represents a number of contractors developing integrated pest management systems. To dispel customer's fears, Barrows provides material safety data sheets 48 hours prior to application. He also notifies adjacent neighbors of new clients and those where drifting might expose their lawns to pesticide spray. He also, on his card, invites customers to call day or night with questions and concerns.

"When people know what substances are being used, they're much less apprehensive. The MSDS sheets list phone numbers for the local poison control centers. They say what the products are for and what the side effects are. That's what the public wants to know."

Residential clients' concerns mainly involve potential risks to pets and children. Contractors said they inform clients on which pesticides won't put pets at risk, and

how long they need to keep off the lawn.

"A lot of clients use common sense. We tell them to stay off the lawn until it's dry, about a 1/2 hour to 45 minutes after application. And they'll keep their children or pets off the lawn for that time period," McQuay said.

Many contractors also assure customers they aren't making blanket applications, and that the pesticides they use are diluted hundreds of times.

"It's up to the people using the product to adhere to the label and not use them in a discriminate manner," said Ray Jacques, supervisor of the plant health department for Ted Collins Associates, Victor, N.Y.

Contractors can join a number of organizations to obtain information on how to use products and avoid problems or misuse, he said. Lawn care professionals also can access city and state environmental services for advice on pesticide application matters.

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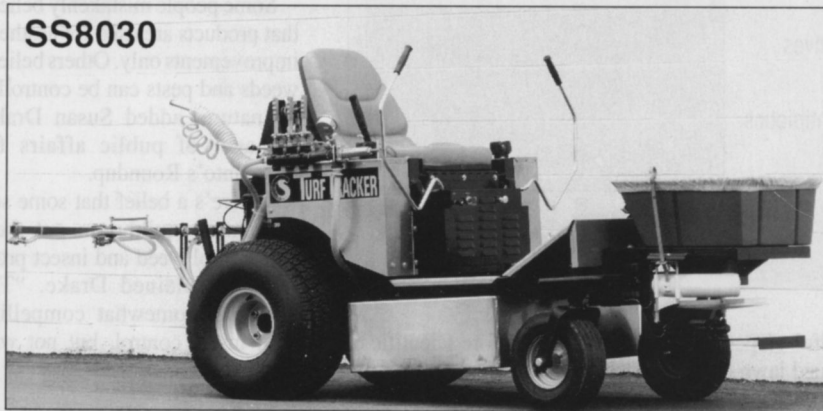


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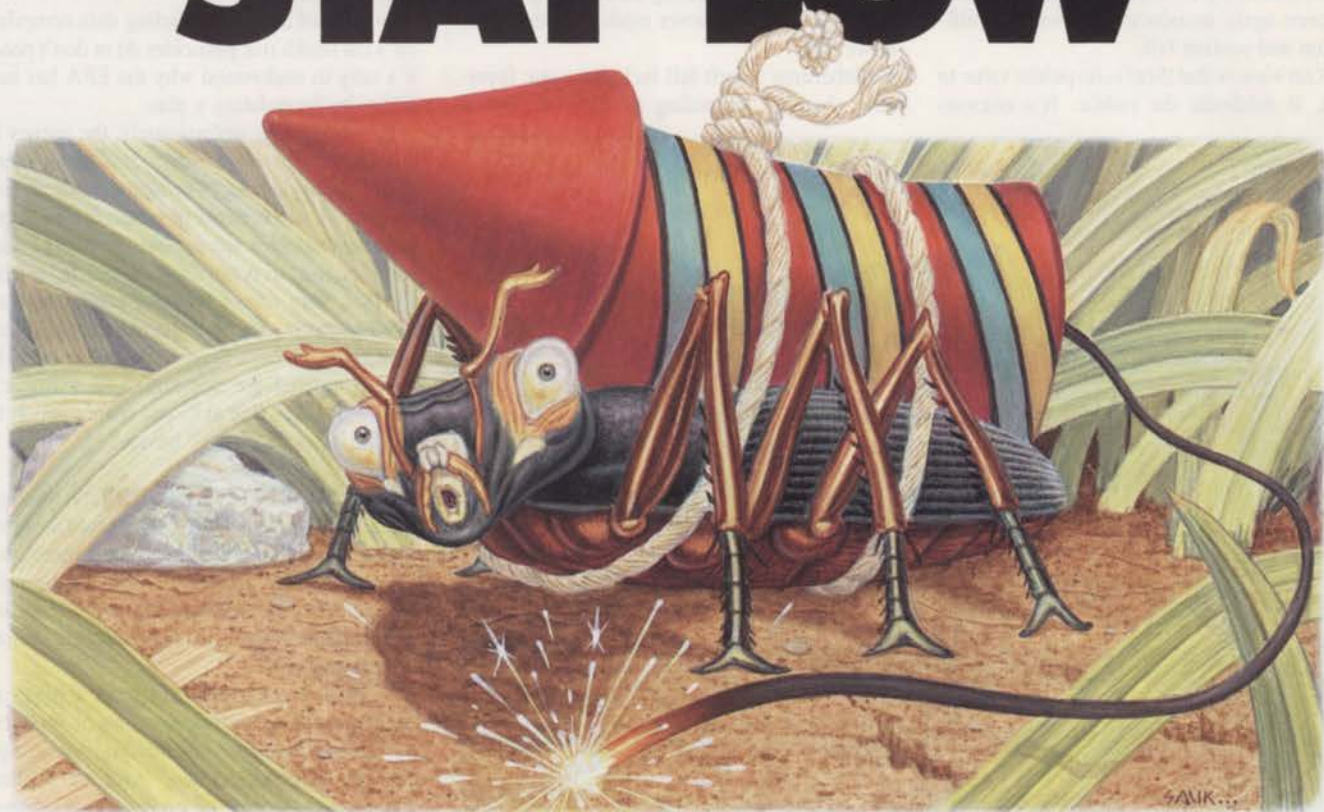
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**USE READER SERVICE #22**

## Pesticides

(continued from page 34)

Manufacturers, too, have jumped into the education pool, establishing extensive public relations programs for customers and the public.

**FOLLOWING THE LAW.** On the legislative front, Sen. Joseph Lieberman, D-Conn., plans to once again introduce his lawn prenotification and posting bill.

"Our view is that there is no public value to that. It misleads the public. It's onerous

legislation and difficult to comply with," James said.

Lieberman introduced The Notification of Chemical Application Act, which would amend the Emergency Planning and Community Right to Know Act to regulate the lawn maintenance industry, in 1991 and again last year. A Senate committee held hearings both years, allowing members of the Professional Lawn Care Association of America among others to input their concerns. The bill never made it to the floor, however.

Lieberman's draft bill includes some favorable changes, according to PLCAA, but it

remains uncertain when or if public hearings will be held this year.

Tom Delaney, PLCAA's director of government affairs, said he plans to continue fighting to have the bill tacked onto FIFRA legislation rather than the Emergency Planning Act, since FIFRA regulations already cover lawn maintenance firms and are administered by the state departments of agriculture and conservation.

In light of all the conflicting data compiled on what health risk pesticides do or don't pose, it's easy to understand why the EPA has had difficulty formulating a plan.

"Fortunately or unfortunately, the agency is a fishbowl. There are many opinions on every issue," Johnson said. "The agency must evaluate the risk and benefits of pesticides. Inherent in that, pesticides are substances with chemicals designed to control and eliminate, or kill. By their very nature they are substances that have potential to be quite dangerous. That makes the process even more difficult." He also compared the committee to a Rubik's Cube. "It takes fine skill and manipulation to get the sides to match," he said.

**TURN TO BIOTECHNOLOGY.** Although biorationals have not hugely impacted the lawn maintenance market, many manufacturers believe lawn care applicators will increasingly accept them as part of their IPM plans based on public demand, worker safety and higher insurance costs.

"I think biorationals will have a place as people become more demanding of products not having the same residual and toxicological effects of pesticides," said Dr. Milton Kageyama, director of product development for O.M. Scott & Sons.

A number of lawn care operators are skeptic about the viability of biorationals available today. "Of the few customers that request IPM treatment, none stick with it," said Drew Madzin of Royal Lawn, Freehold, N.J. "They're too competitive with the Joneses. They don't want weeds in their lawns."

The EPA endorses using biorationals as part of an IPM system. "The message we try to get across is that there are a number of things a person can do to control weeds and insects," Johnson said. "An integrated management system is like a bagful of tools you can use to control pests. Chemical pesticides are sometimes needed, but there are alternative biological pesticides being registered that can be used effectively."

Biorationals on today's market are fairly insect specific and ineffective against weeds. O.M. Scott and AgriDyne jointly offer Turplex BioInsecticide containing azadirachtin, a compound extracted from the Neem tree seed that acts as an insect growth regulator and feeding deterrent.

Ciba-Geigy introduced Exhibit, a biorational containing nematodes, in 1991. Exhibit is used on turf to kill sod webworms, cutworms

(continued on page 101)



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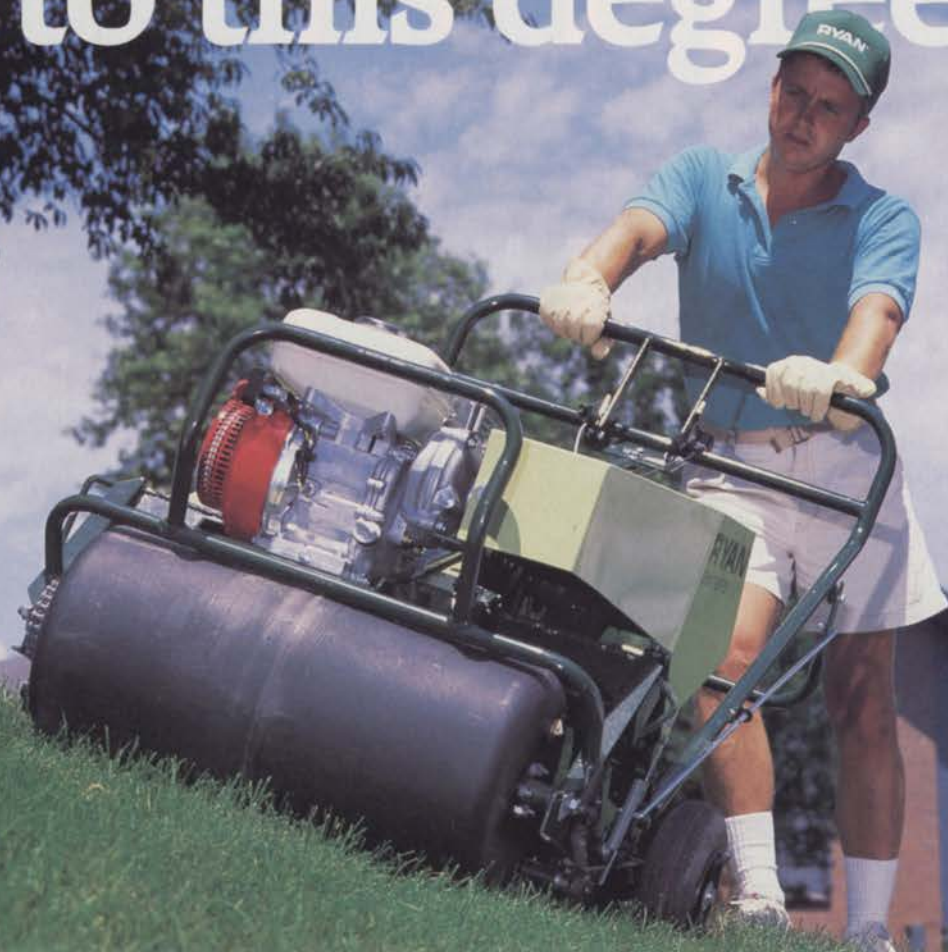
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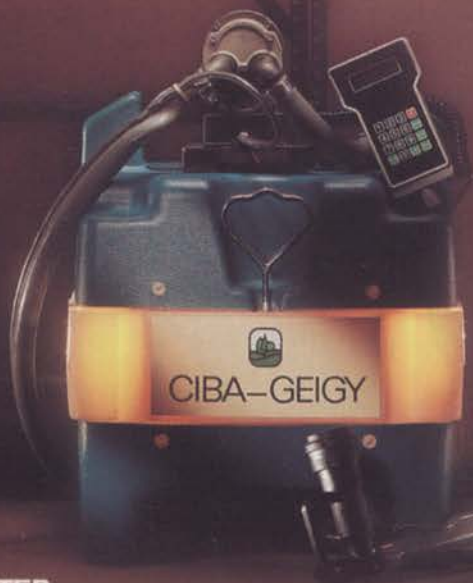
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# The Ultimate Mulching Machine: Does It Exist?

*As yard waste bans on landfills continue to be enforced across the country, lawn maintenance professionals are in search of the ideal recycling mower. In the face of high demands, even manufacturers hesitate to deem themselves the masters of mulching.*

By Cathy Hoehn

HOW CAN seemingly insignificant grass clippings wreak such havoc on the nation's solid-waste dilemma?

That question, which danced in the minds of lawn and landscape maintenance operators only a few years ago, quickly became a moot point as a more pressing issue

surfaced: What to do about it?

The obvious recourse for the green industry was to find an alternative to bagging, namely mulching.

"The landfill crisis began fostering a whole new approach to lawn care because it was really unnecessary to collect grass clip-

pings, put them in plastic bags and haul them off to a dump," said Ann McClure, executive vice president of the Professional Lawn Care Association of America.

Research shows yard waste constitutes 20 percent of the solid waste dumped in landfills in the United States, and grass clippings

make up half of that, according to PLCAA. Because of the high statistics, 27 states will ban some degree of yard waste from landfills by 1996. Government officials expect nearly 6,000 landfills to close by the same year due to tough regulations.

Michigan, for example, already restricts where contractors can rid yard waste. "If you're a contractor you cannot dump clippings in trash that goes to the landfill," said Chris Pompeo, vice president of operations for Landscape America in Warren, Mich. "There are designated sites to dispose of the clippings set up by some large municipalities and private contractors. But the lawn contractor has to pay to dump there. I think some contractors might lean more toward mulching because it costs them money to get rid of their clippings."

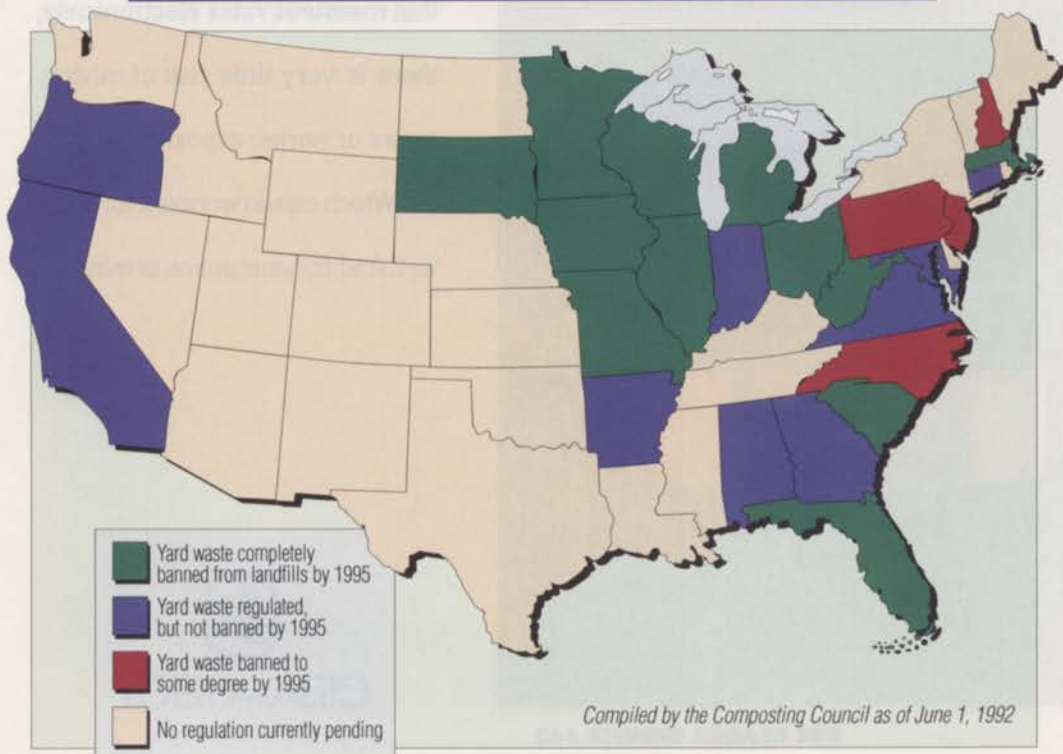
In California, regulations mandate residents reduce trash yield 25 percent by the end of 1994. "That's when everyone started recycling," said Richard Wills, vice president of Landscape Systems, Ontario, Calif. "Trash yield has to be reduced another 25 percent by 1996, so people will look at reducing yard waste in order to meet that goal. Eventually recycling grass will be a big thing."

"More and more restrictions on landfilling is forcing cutters to look to mulching," said John Crowson, national sales manager for Scag Power Equipment, Mayville, Wis. "Three years ago mulching mowers were a unique novelty. Today they're a real concern. The number of inquiries about mulching mowers has increased greatly and I think that is going to continue."

**WHY MULCH?** Despite increasing landfill regulations, many within the industry still mow according to convenience, cost and customer expectations. "It really depends on the

(continued on page 42)

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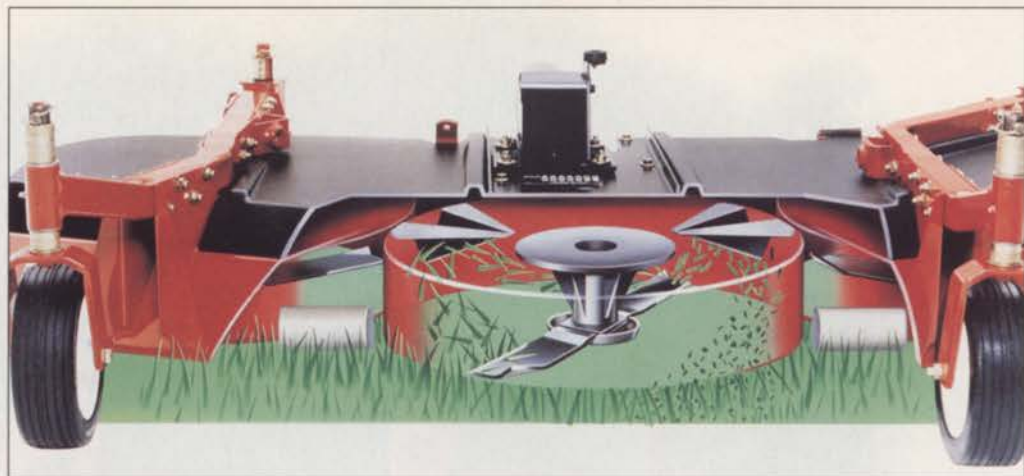
## Mulching Mowers

(continued from page 40)

customer's requirements as to whether the mulching mower is the way to go," said Jim Wallace, marketing manager for The Toro Co., Minneapolis, Minn. "If you use mowing mulchers on very, very lush lawns, you'll end up cutting the grass more often and invariably it doesn't look as good and you end up going back."

Pompeo maintains that upscale residential clients don't stand for mediocre lawn manicures, and contractors won't risk losing those clients. "I know a lot of people out there who say recycling grass clippings is the way to go, and to a certain extent I agree," he said. "If the area is big enough and it's the type of grass that lends itself to that system, then fine. If you're talking about lush lawns for upper-scale residences, you're not going to lose the clippings in the grass. You're going to see them on top."

Other contractors employ tricks of the trade to improve mulching,



An illustration from Toro depicting the mulching action of its Recycler mower.

Pompeo noted, but he's not buying the alleged benefits. "A lot of guys say they double cut — cut in one direction, cut in the other direction. That's fine but if you cut it once, you pick up the clippings and you're done. You double cut, what are you saving?"

On the other hand, Wills said, he believes contractors should point out mulching's advantages rather than perpetuate a customer's negative views. "People want ex-

tremely groomed environments for their homes. You have to educate customers on the benefits of mulching because the mowers won't always cut to a fine powder," he said.

Of those who mulch, most contractors indicated cost played the most significant role in their decision to do so. Pedro Berreles, project manager for Moore Landscapes, Glenview, Ill., switched to mulching mowers when land-

fill laws required him to haul clippings 30 miles. On residential jobs, he made the switch and then asked customers for their opinions.

"They couldn't tell the difference with the mulching mowers," he said. With commercial clients, "they didn't care what equipment

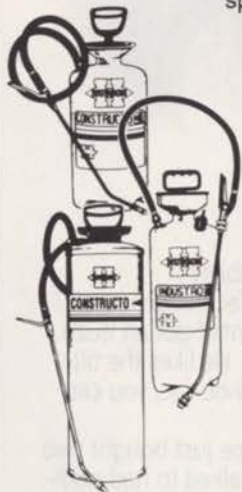
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Liquid Iron. To conduct the demonstration, Landscape Services Inc. divided the lawn with a plumbline on June 5, 1991, and walked the treatment on the turf, using a ChemLawn gun. LSI supervisors are shown admiring the difference before spraying the rest of the turf.

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Obviously, LSI is doing well on both

counts, as witness the fact that they are one of the largest companies of this kind in the South.

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Carl Love

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Love goes on to say that LSI has tested many liquid irons, but says that none of them measure up to Ferromec.

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## Mulching Mowers

(continued from page 42)

we used as long as we got the job done. They know us and trust us to do a good job," he explained.

Eliminating hauling is only a portion of potential cost savings. Some contractors contend that not bagging the clippings saves time, which translates into lower labor costs. Bruce McQuay of the Fort Worth, Texas, branch of Maintain Inc., estimates his branch saves almost \$2,000 per year on each job site by mulching rather than bagging. The savings allowed the company to focus on other services such as pruning and weed control.

"In the 90s, everyone is dropping numbers. Switching to mulching mowers helped us. We're more efficient. We reduced costs and lowered our prices," he said.

Wills, though a firm believer in mulching, said the process doesn't save Landscape Systems time or labor. "Maybe that will happen as we learn the differences between mulching mowers and the oth-

ers," he conceded. "There's definitely a learning curve that goes along with it."

Bob Tracinski, division manager of media relations for Deere & Co., Raleigh, N.C., added other factors to the list of cost savings when mulching.

"Mulching allows the operator to get onto the property, mow, do the job well and move on. If you have to collect the clippings, that means paying for gas, an additional vehicle and an additional person. That adds a lot of time and expense."

Those who don't mulch often hide behind the myth that mulching causes thatch, claimed Tracinski, who said there are methods to ensure good turf quality. For instance, following the one-third rule — cutting only one-third the length of the grass blades at any given time — reduces shock to the root systems, because root depth is partly determined by grass height. Scalping, or cutting the grass too short, causes some of the root system to die, which creates thatch buildup.

Shallow water encourages grass roots to stay near the soil surface where moisture is easy to find. Therefore, it's better to water infrequently, but deep into the soil to encourage grass roots to grow down 6 to 8 inches, Tracinski said.

Another common complaint about mulching is the brown trail of clippings mowers sometimes leave behind.

"What's happening is that contractors aren't reducing clippings enough so that they will fall between grass blades in the lawn," Wills said. "True mulching mowers are designed to almost powder the clippings."

**MOWER PERFORMANCE.** Maintenance professionals are now rating mulching mowers fairly highly, compared to an informal survey conducted by *Lawn & Landscape Maintenance* two years ago (March 1991). Those interviewed for this article said they've seen recent equipment improvements, but that some drawbacks remain.

David Frank of David Frank

Landscape Contracting in Germantown, Wis., said he believes today's mulching mower market leaves room for improvement.

"There are a lot of considerations when looking at a mulching mower, not all of which are answered by today's mowers," he said. "For example does it mulch grass, does it mulch leaves, does it mulch wet grass, does it mulch deep grass or can you get a piece of equipment to work in a number of situations? The idea is to find the best system to mulch where the turf looks great when you're finished and you don't have a real abnormal increase in how frequently you have to mow."

Of the mowers available, Wills prefers walk-behinds designed specifically for mulching rather than modified traditional ones. His only criticism is low performance on wet grass. "Some say its best not to mow wet grass. The reality is that sometimes you're going to have to," he said. "If we're going to cut grass that's wet, we bag it instead."

(continued on page 46)

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## Mulching Mowers

(continued from page 44)

Deere & Co. doesn't advise mowing in wet grass, particularly young grass in the spring. "You run the risk of pulling young grass out of the lawn and increasing ground compaction so

that air, water and nutrients can't get to the turf's root zone," Tracinski explained.

A mower's job performance often depends on how sharp its blades are. Companies offer blades with varying sharpness, but they can't control how well a contractor maintains them. "We

bought a couple of spare blades and change them every other day and sharpen them," Wills said. "That may sound like a lot but it's a five-minute job."

Those that don't mulch are waiting for upgrades in the market. Matt McCoy of McCoy Landscape Services, Marion,

Ohio, believes his traditional mowers leave lawns looking better than mulching mowers could. "We weren't satisfied with the test results we saw on mulching mowers. We're waiting for improvements before doing our own tests."

Similarly, Al Overby of Colorado Landscape Enterprises, Westminster, Colo., said his company plans to consider mulching mowers when the old equipment needs replacing. "We'll consider them if they're comparably priced. One concern is that we would have to change our fertilizer format to promote less top growth."

Maintain's Fort Worth branch tested side-chute, "no-bag-it" mowers at a customer's request, but opted for rear-bag mowers, McQuay said. "We would have had to tailor our fertilization and irrigation programs to that."

**RATING THEIR OWN.** Even the manufacturers producing the mowers aren't completely satisfied their products are meeting market needs. "Mulching is a

## MOWING ALTERNATIVES

FOR CONTRACTORS whose clients aren't happy leaving clippings in the lawn, but who want to divert yard waste from landfills, Chris Pompeo, vice president of operations for Landscape America, Warren, Mich., suggests collecting the clippings to use in fertilizer.

"We pick up most of our clippings and mulch them here in the yard into planting mix to use back on the job site as a planting medium," he said.

Most of Landscape America's jobs are smaller commercial projects and large residential properties. At those sites, the maintenance crews bag the clippings and leaves and haul them back to the yard, where they're mixed with soil in a shredding machine.

"You have to have an area where you can dump clippings and set up soil," Pompeo said. "A lot of small contracting companies don't have a yard, they just operate out of their house, so obviously they don't have the room."

Pompeo said the system works well for his company, but incurs some costs at the onset. "First, there's the expense of the machine, then the expense of the property to set up this type of area."

Before purchasing the shredder, the crew used an end loader to mix material. "You take a little bit of grass, a little bit of clippings, pick it up, dump it on the ground, pick it up, dump it on the ground. Just keep doing that until it's mixed up. The machine is a lot quicker, of course, but it works either way," Pompeo said.

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whole new ball game," said Bob Tomasek of Walker Manufacturing, Fort Collins, Colo. "People say they can mow under almost all conditions, then they qualify it by saying, well, sort of. There's a lot of work that needs to be done in the area of mulching."

"As of yet, I don't think there's one mulching mower available that does a good job in every condition that the operator runs into," said Scag's Crowson.

The challenge in developing an effective mulching mower is how to channel the air, said Toro's Wallace. "It needs a good suction initially to get the grass to stand up straight and to get a good cut," he explained. "Then it needs to hold the grass in the chamber long enough to chop it into tiny pieces, and then blow the grass down into the turf." It also needs a smooth mowing chamber "with no lip on which clippings can collect and clump together," he added.

Many manufacturers have risen to meet the challenge, while also trying to heed the commercial

contractor's call for more versatile mulching mowers with side discharge capability for walk-behinds and rear bag and wider decks options for riders.

Toro recently upgraded its Recycler mower line, first introduced two years ago. Available in sizes up to 72 inches wide, the Recycler employs a plastic kicker installed underneath that helps grass stand up so it can be cut several times, and then helps flow air so clippings blow back into turf.

Deere & Co. introduced the Tricycler mulching mowers in 1989, products which have since been upgraded. Tracinski said the mower transforms into a side discharge or rear bagger without removal of the mulching blades, providing more flexibility than a dedicated mower. The company "premiered" various plate attachments with differing positions, namely higher for mulching grass and lower for mulching leaves. The Tricyclers also offer a rear attachment for collecting leaves and clippings.

The Versadeck walk-behind

recently introduced by Ransomes America Corp., Lincoln, Neb., serves as the company's first venture into the mulching arena. The machine is dedicated, but includes removable bolt-on mulching inserts for conversion to bagging or side-discharge. The inserts' specially sharp mulching blades with dome configurations ensure maximum chopping of grass, said Jim Hoffmeister, territory manager for Ransomes.

Encore Manufacturing, Beatrice, Neb., introduced a mulching kit for its 36- and 48-inch walk-behinds last spring. The baffle fits underneath with a cover over the discharge area, said Gary Rogge, plant manager. Two low-lift blades replace two of the regular high-lift blades, chopping clippings continually until they fall to the lawn. There is no special air channel to lift the grass blades or blow them back into the grass, Rogge said.

Scag also offers a mulching kit for its mowers with up to a 61-inch deck. The kit closes the discharge opening, capturing the

clippings for finer cutting.

One entrepreneuring lawn and landscape professional, not quite satisfied with what he found available on the market, designed his own mulching blade. Louis Nescone II, owner of Weegy Mowers in Lakewood, N.J., offers what he claims is the first commercial reversible mulching blade for walk-behinds. The blades have two separate cutting levels so the grass is cut at least twice with each revolution.

"I couldn't find a mower with blades that met my needs, and I couldn't afford to spend \$6,000 on each new mower, so I pounded out my own blade design," he said.

Manufacturers have yet to produce the perfect mulching mower but the future holds promise, said Crowson. "There's going to be a lot of improvements in the next five years. The mulching market is here to stay." ■

*The author is Associate Editor of Lawn & Landscape Maintenance magazine.*

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# Controlling Annual Crabgrass

CRABGRASS, THE BANE of the homeowner lawn.

Crabgrass and dandelions share the distinction of being the most prevalent weed problems in North American turf. Crabgrass is particularly troublesome because of its aggressive growth rate which allows it to outcompete most turfs during the summer months. Thankfully, crabgrass is an annual plant which dies each fall giving turf managers a chance to gear up for next spring's battle.

Crabgrasses are members of the genus *Digitaria* (derived from Latin *digitus*, for finger) which contains approximately 60 species. You may be surprised to learn that crabgrass was an important food crop in China as far back as 2700 B.C. and is still used as a cereal crop in some cultures.<sup>1</sup>

Surprisingly, crabgrass was introduced to this country as a forage crop in 1849 by the United States Patent Office.<sup>1</sup> However, crabgrass never really caught on as a forage grass despite its considerable production of seed and dry matter. Once introduced, crabgrass emerged as a considerable weed problem not only in turf but in other crops such as peanuts and sugarcane.

Two species of crabgrass create the chief weed problems in turf. Large crabgrass (*digitaria sanguinalis*) and smooth crabgrass (*Digitaria ischaemum*) are both highly competitive; large crabgrass is more common in the southern portion of the United

**Preventively**  
*Crabgrass control is generally a frustrating proposition, but it can work if approached with a proactive turf management program.*

*By Bruce Branham*

States and smooth crabgrass has a slightly more northerly adaptation. Both species, however, are found as far north as Canada.

Crabgrass is a troublesome weed because it grows in a pros-

trate spreading manner when mowed, produces abundant tillers and sets a large seed crop. A single large crabgrass plant was found to produce 700 tillers and 150,000 seeds. Just be thankful

you don't manage turf in a tropical environment. Under tropical conditions, large crabgrass can act as a perennial species producing even larger numbers of seed.<sup>1</sup>

Goosegrass is another serious annual grass weed in turf. Goosegrass is adapted to the transition zone and warm-season grass growing regions. It can tolerate close mowing and can be a serious weed on golf course greens. It also grows well on compacted soils, and is often observed in the cracks in the cement of sidewalks and driveways.

Occasionally, green and yellow foxtail show up as weeds in turf. Other annual grass weeds such as barnyardgrass and fall panicum can't stand up to the rigors of frequent mowing, and are generally problems only in new seedings.

## CONTROL MEASURES.

Of the three major pest classes, weeds are the least amenable to biological controls. Currently, there are no commercially available biological controls for crabgrass.

An important aspect of any weed control program is using proper management to limit potential weed invasion. Proper management is really just the ABC's of good turf supervision. Fertilize properly to ensure good turf density, but don't overfertilize. It can make the turf more susceptible to disease and insect attacks.

(continued on page 50)



A general photo of crabgrass, one of turf's most prevalent weeds in turf. Photo: B. Branham

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## Crabgrass Control

(continued from page 48)

Mow the turf at the highest practical height of cut. This ensures deep rooting and a healthy, dense, competitive turf. Light can stimulate weed seed germination so keeping a dense, canopy with maximum leaf area will help reduce the number of weeds invading the stand.

During weed seed germination, irrigation should be applied as needed. Frequent irrigation keeps the surface soil and thatch moist which promotes weed seed germination. Areas that have lost turf due to wear, disease or insect problems should be overseeded and, if applicable, the underlying cause for turf loss should be corrected.

Chemical control measures currently rest entirely with herbicides. Researchers at Iowa State University have discovered a corn byproduct that may have commercial applications for preemergence crabgrass control, but this product is still being developed.

## DISSIPATION OF A HYPOTHETICAL PREEMERGENCE HERBICIDE

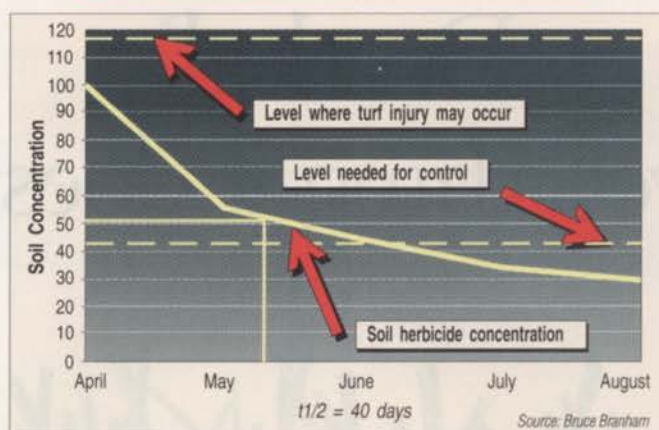


Figure 1.

Chemical weed control applications can be conveniently divided into preemergence or postemergence applications. A preemergence application is made prior to the germination of the weed. A postemergence application is made after the weed germinates and becomes established.

Preemergence applications are by definition preventive applications made without knowledge of the intensity or distribution of the weed problem. Postemergence applications are curative applications, and thus can be targeted only at those areas where weeds are present. This article will fo-

cus only on preemergence product applications.

Preemergence herbicides used on turf share several properties. It is important to understand these characteristics as they impact performance and environmental safety. The main feature all preemergence herbicides share is a very low water solubility.

Bensulide is the most water soluble of the preemergence herbicides with a water solubility of 26 ppm. (This means that at most, 0.001 ounces of bensulide could be dissolved in 1 quart of water.) Several of the commonly used turf preemergence herbicides have water solubilities of 1 ppm or less. Why are these herbicides practically insoluble in water?

The reason lies in the way a pre-emergence herbicide must work. These herbicides are applied in the spring prior to annual grass germination, and must not only control the initial germination of these grassy weeds but ideally provide season-long weed control. This requires the herbicide

(continued on page 52)

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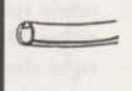
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## Crabgrass Control

(continued from page 50)

to be present in sufficient quantities to control weeds from April through July — up to four months residual control.

Most weed seeds germinate at or near the soil surface, so to be effective a preemergence herbicide must stay at or near the soil surface. Thus, a herbicide with significant water solubility gradually moves down into the soil with irrigation and rainfall, and loses its effectiveness.

People opposed to the use of pesticides criticize a preventive (i.e., preemergence) application as unnecessary and a pollution risk to ground and surface waters. Because of their low water solubilities, however, preemergence herbicides show essentially no risk of being transported to ground or surface water from turf. Thus, these products are safe to use in regard to polluting ground or surface water.

Preemergence herbicides are

also characterized by having long soil residuals. Persistence in soil is a complex topic since many different processes act in concert to reduce the concentration of the applied herbicide. The term soil half-life,  $t_{1/2}$ , is defined as the number of days it takes to reduce the

**A chief concern  
of preemergence  
use is that  
the herbicide  
may injure  
established roots.**

concentration of a herbicide to  $1/2$  of its initial concentration. Most half-lives of preemergence herbicides range from 40 to 100 days, whereas 2,4-D, a common postemergence broadleaf herbicide, has a  $t_{1/2}$  of between 7 and 14 days.

The soil residual provides the long-term control that separates a good preemergence herbicide from an excellent one. Figure 1 displays a hypothetical dissipation curve for a preemergence herbicide. Immediately after application several processes — volatilization, photodegradation and microbial degradation — cause the concentration of the herbicide to drop.

This dissipation occurs rapidly at first, but then typically slows to a lesser rate of dissipation. The slower rate of dissipation can be visualized as occurring after the herbicide has worked its way into the soil and processes like volatilization and photodecomposition become a little less significant.

In Figure 1, control starts to break in early June with crabgrass probably becoming noticeable in July, since it takes several weeks to go from seed to a visible seedling in turf. This figure should help explain why control with the same herbicide may vary from

year to year. Climate and application variables will affect how rapidly the various dissipation processes result in the loss of the herbicides. So from year to year, the date when the concentration falls below the critical value could increase or decrease.

This figure also explains why the label of some less persistent herbicides may recommend a second application of the herbicide at six to eight weeks after the initial application. This second application will boost the soil concentration back up to levels that should provide control for the rest of the summer.

**INDUSTRY OPTIONS.** Several recently registered preemergence herbicides have been added to the list of currently available preemergence herbicides. (Table 1) These newer herbicides have some distinguishing characteristics that should be considered when choosing herbicides.

Dithiopyr is perhaps the most intriguing of the new products.





**THE WORST PART ISN'T  
THAT SHE'S CALLED BACK  
THREE TIMES, OR THAT  
SHE PROBABLY WON'T RENEW.  
THE WORST PART IS THAT  
SHE'S GOT NEIGHBORS.**

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Bet you'll use Triumph first, next time.



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Its use rate is low with the current label calling for 0.38-0.5 lbs. AI/A from the 1EC formulation. This is the only preemergence product which also can provide significant postemergence control. Thus the timing of application can extend into the early germination phase of crabgrass.

Once crabgrass begins to produce tillers, the postemergence activity of dithiopyr falls off dramatically. However, this product will permit the applicator to make applications later in the spring when germination may have already started. In addition, dithiopyr has been shown to have outstanding residual activity providing season-long control.

Prodiamine is a new product from Sandoz that has shown excellent crabgrass control at relatively low use rates of 0.5 to 0.75 lbs. AI/A. Prodiamine has also exhibited season-long control when applied at the label rates which indicates this product has a relatively long life in the soil.

Prodiamine is in the same

### CURRENTLY AVAILABLE PREEMERGENCE HERBICIDES FOR USE IN TURF

HERBICIDE	MANUFACTURER	TRADE NAME
BENEFIN	DowElanco	Balan
BENSULIDE	ICI	Bensumec, Betasan, Lescosan
BUTRALIN*	Rhone-Poulenc	Chipco Choice
DCPA	ISK Biotech	Dacthal
DITHIOPYR*	Monsanto	Dimension
PENDIMETHALIN	ICI	Pre M, Scott's Weedgrass Control
PRODIAMINE*	Sandoz	Barricade
OXADIAZON	Rhone-Poulenc	Chipco Ronstar
SIDURON	Dupont	Tupersan

\*Compounds recently registered for use in turf.

chemical family, the dinitroanilines, as other commonly used turf herbicides such as benefin, pendimethalin and trifluralin. Thus, it has some similar characteristics such as very low water solubility (< 1 PPM) and a common mode of action. It appar-

ently has a longer soil  $t_{1/2}$  than benefin or trifluralin, however, and is at least equal to the soil  $t_{1/2}$  of pendimethalin. Prodiamine provides excellent control, but does not pick up any annual broad-leaves as do several other preemergence grass herbicides.

Butralin (Chipco Choice) is a new product this year. Butralin is also a dinitroaniline herbicide and its use rate is higher (5 to 6 lbs. AI/A) than either dithiopyr or prodiamine. This product provides good to excellent annual grass control. It has excellent turf safety as well.

#### HOW PREEMERGENTS WORK.

Most all of the preemergence herbicides used in turf have a similar mode of action. The preemergence herbicides, with the exception of oxadiazon, work by inhibiting root development of the seedling weeds. Treated plants will exhibit swollen root tips which shorten the entire root. Most of the herbicides work by inhibiting cell division in the root tips, causing the roots to swell and stop taking up water. Thus, the affected weed seedlings die due to water loss. As previously mentioned, oxadiazon has a different mode of action that involves the inhibition of photosynthesis.

Table 1

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One of the chief concerns with preemergence herbicide use is that they may injure the roots of established turfgrasses. Turf-grasses are usually not injured by preemergence herbicides because the herbicide is on the soil thatch surface above the zone where root growth and initiation occurs. This is another reason why preemergence herbicides need to be immobile in the soil; if they moved downward to any extent they would injure the desirable turfgrass roots as well.

A turf manager should always check for signs of root damage to the turf. Excessive rates of the herbicide, perhaps from overlap during application, can cause turf injury. Injured turf will often appear to be suffering from drought stress. Turf with a thick thatch layer can be injured by preemergence herbicides since the thatch is much more porous than soil and the herbicide can penetrate further into thatch, particularly when granular products are used.

In instances of thick thatch layers, turfgrass plants often have their crown tissue located in the thatch layer and new roots often appear from the lower portions of the crown. Thus, a degree of caution should be exercised in using a preemergence herbicide under these conditions.

The dinitroaniline herbicides have been termed "root-pruners" because of their tendency to inhibit root growth. Pendimethalin is generally acknowledged to cause some root pruning but field data to support this belief is variable.<sup>2,3</sup> Users should be aware of the potential for injury and closely monitor turf performance for signs of root dysfunction.

**APPLICATION TIMING.** Application timing is important to achieve the best results. The closer the application is made to the time of crabgrass germination, a longer period of preemergence control should result. Applications made well in advance of annual grass germination will generally result in the dissipation of some of the herbicide before germination begins lowering the concentration of active ingredient. (Figure 1)

Several environmental indicators have been used to predict the timing of application. A common indicator is the Forsythia bush. When the blooms begin to fall, it

is time to start applying the preemergence herbicide. Soil temperatures have also been used to time applications, with a value of 65 F at the 2-inch depth being widely regarded as an indicator that crabgrass will begin germinating.

However, soil temperature is controlled by several factors including angle and direction of the turf (i.e., south facing exposures will heat up more quickly) and buildings, sidewalks and drive-

**Most  
preemergent  
herbicides  
work  
by inhibiting  
root development  
of seedling  
weeds.**

ways can significantly increase the rate at which adjacent soil warms. These environmental indicators should be used in combination with your own experience base to determine when to apply these herbicides.

Properly applied preemergence herbicides usually produce excellent results. One of the biggest problems facing lawn care applicators, however, is ensuring uniform, even coverage. Utmost care should be taken to ensure that the herbicide is applied uniformly. When proper overlap is not achieved, striping of the turf can occur. Non-uniform distribution of the herbicide is perhaps the primary factor in customer callbacks for poor crabgrass control. ■

*The author is a professor in the Crop and Soil Sciences department at Michigan State University, E. Lansing, Mich.*

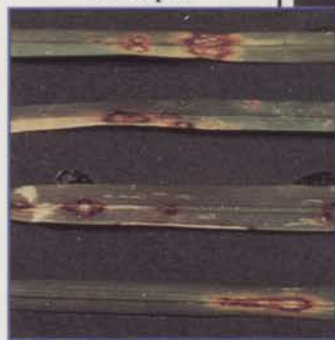
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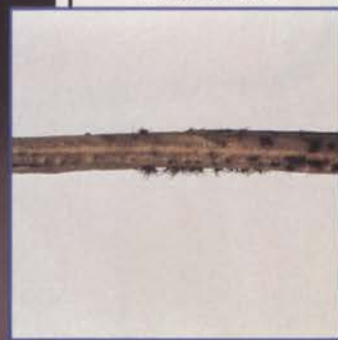
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USE READER SERVICE #23



# Marketing: Measuring the Ideal Customer

*Defining the perfect client is the first of four steps to increased sales, profits and satisfaction.*


*By Matt Shooner*

ARE YOU REALIZING all of the potential sales and profits available to you in your market? Chances are good that your answer is connected to how you approach and handle your company's marketing.

Take these two scenarios for example. It's mid-summer for Company A. Partners Joe, Lloyd and Mark review their performance in revenues per account, retention rates by zip code, service call-to-sales conversions, number of referrals and change in average property size. They celebrate hitting most of their goals for the past year and then get to work fine-tuning a program that will keep them moving in the right direction during the upcoming season.

It's mid-January for Company B. Partner Bill is busy getting production equipment and personnel ready to go. Partner Jim is setting up the advertising, more-or-less like they did it last year. They're both so busy, they barely discuss their marketing, much less study whether they're going to get the most mileage from their investment. It has the makings of another last-minute marketing program.

Think for a moment of a shotgun and a rifle. A shotgun shot sprays a pretty wide area. Some may hit



the target, but a lot is bound to miss the mark. The rifle, on the other hand, must be more carefully aimed but delivers cleaner, more efficient results. Now consider how you promote your business and services: have you been using a shotgun or a rifle?

The discipline required to better aim your promotional efforts will be well rewarded if you are willing to put aside the shotgun and go through the target practice required to master the use of a marketing rifle.

The first of four essential steps in building a great marketing program involves "scoping out" the profile of your ideal customer. What makes them special and why do they buy from you? Until you can clearly identify who your best clients are (and why), you can't effectively go out into the marketplace and find more like them.

The most successful businesses in the green industry have marketing plans that are tightly focused and efficient. They have realized that merely believing they're good at what they do is no longer good enough. They are concentrating on becoming better at what they do by working hard to first understand, and then meet, the needs and desires of clients.

They realize that by really "walking the walk they talk," they will expand their customer base and meet more of their goals.

Companies that are on the move and growing no longer see marketing as an add-on expense they must endure each season. They've come around to appreciate marketing as the holistic, business-building process it actually is.

When viewed and worked as a system for meeting goals, marketing can move from the status of "necessary evil" to become the tightly aimed dynamic force behind the most important business decisions.

The first step is to look carefully at what you're currently doing. If you'll consider making a few changes in your basic approach to marketing, you may

find a way to start enjoying greater success and satisfaction for you, your employees and your customers.

**FOUR EASY STEPS.** In building a marketing system that works it's essential to develop, and then follow, a solid annual schedule.

But, before this kind of regular schedule can begin, there is the one-time task of establishing what is called a "critical area" baseline of performance for your company.

The following four functions are all important to successful marketing, but all depend on the first step you take to measure where you really are today.

1. Create a baseline of your company's critical areas.
2. Perform regular evaluations of marketing performance.
3. Plan a marketing strategy for the next 12 months.
4. Implement the marketing plans you've laid out.

Evaluating, planning and implementing cannot be fully effective until you first create the baseline. If this is new to you, don't be intimidated by the process. It may be the first step toward realizing all of the goals you've set for your company.

**CRITICAL AREA BASELINE.** You need to get a handle on where you've been and where you are before you can realistically start deciding where you're headed. This involves putting together some basic facts about your "average" and "ideal" customers, as well as your company and the services you currently offer.

If you haven't done it for awhile, take a hard look at just who's buying your services and develop a profile of your customer base. Your client profile should include as much information as possible. The idea here is to discover the specific characteristics that make up both your average and ideal customers and, if possible, to find out why they buy from you.

Geographic location, average family income and home value should be determined. It's also helpful to know the average property size, your average annual revenues, average service callbacks and the average tenure (how long you're keeping customers).

If your records are on a computer, this should be fairly simple to determine. Even if you have to manually calculate your averages, it's well worth the effort.

Once you know the profile of your average customer, go back through your research to determine who is your best, or ideal, client. Normally, the ideal client is the one who buys the most services over the longest period of time and at the lowest total cost to your firm.

Look at your long-term customers and break out the ones who spend the most while creating the fewest service calls each season. Look for patterns among this group — like where they live, their age, home value, probable family income and lifestyle.

Once you've established your ideal client profile, you've outlined the group which deserves the lion's share of your marketing efforts in the future. But identifying your ideal customer is only half the battle. Now you need to know why this statistically great individual has been buying from you instead of your competition.

**UNIQUE SKILLS.** Every company has unique abilities and experiences that set them apart from their competition. Your company is no exception. Make a list of what you believe makes your company special or different. Include all of the things you do unusually well. And, if you can be so honest, include a list of the things you don't do as well as you would like.

It's important to define your areas of excellence, and what it is that gives you an advantage in the marketplace. It's also helpful to outline those areas needing additional improvements.

In the green industry, some basic characteristics you should grade yourself on include: response speed to inquiries and service calls; knowledge and attitude of your customer service staff; how "customer-friendly" your communications are (including estimates, invoices, service call forms and other leave behinds); the variety of your service mix compared with your competition; the appearance of your field staff and equipment; and the convenience of your hours of operation.

This list is just to get you started. Be sure to include anything that is special about your own operation. After you've made your list of all of the things you think set you apart from the crowd, you should ask your customers if they agree. You may be surprised by some of their answers.

**The most successful businesses in the green industry recognize the importance of marketing plans, and create programs that are tightly focused, efficient and address customer needs.**

Almost all of us have a different view of ourselves than the one our customers hold. So getting "into your customers' heads" through some form of simple research is important to obtaining the hard facts needed to define a clear strategy for growing and efficiently handling your business.

There are several ways to get a handle on how your public really sees you. The most direct is simply to ask them yourself. Invite customer opinions on what they like most (and least) about your com-

*(continued on page 60)*



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## Marketing

(continued from page 57)

pany, and what changes they would like to see.

Approach your cancellations with the same type of questions, organized just a little differently. And be sure not to overlook unsold estimates. Try to discover why they didn't buy your services.

This type of basic research is extremely important to any company that really wants to begin improving their marketing performance, and it's not all that difficult to obtain. Develop three simple, multiple-choice questionnaires or "report cards" (one each for customers, cancels and no-sales).

This type of program can be easily managed by phone or mail, and the feedback you'll get will yield a wealth of information.

With as low as a 15 percent to 20 percent response rate to your inquiries, you'll quickly see clear patterns begin to emerge that will show you the difference between

how you see your company and how it is generally viewed by the consuming public.

When constructing your surveys, remember that the goal is to discover why your ideal client is buying from you.

**MEASURING UP.** Once you've gotten a feel for why your current customers are buying from you, list your "critical areas." These are the areas that matter the most to your best customers. Then evaluate how well you're really

performing in these areas.

Design ways to quantify each of these areas so you can measure exactly where you are now. This set of statistics will become the baseline from which you'll be working to improve future performance.

Once the critical areas for your company have been established, and you've devised ways to measure them, keep it up. The small cost to continue performance measurements from week to week, and month to month, will quickly be dwarfed by the increase in both productivity and profitability you'll experience.

**ACTION PLAN.** There will never be a better time than right now to do the preliminary work needed to refine your marketing and grow your business.

Completing the sample work sheet will help you both determine where you are today and to track future performance.

Building future growth on your current strengths and abilities,

(continued on page 62)

## ACTION PLAN

- Define your average customer.
- Define your ideal customer.
- List everything that makes your company a better buy than your competitors.
- List areas of operations that need improvement.
- Put together a questionnaire or survey to determine why your customers buy your services and what improvements they would most value.
- Ask former customers why they discontinued service.
- Ask no-sales why they didn't buy and what they bought instead.
- Chart the patterns you find in responses, especially from your ideal clients.
- Make a short list of the critical areas of your business that you've discovered matter most to your top customers.
- Design ways to easily measure your company performance in each critical area.
- Establish your baseline of performance in all of the critical areas.



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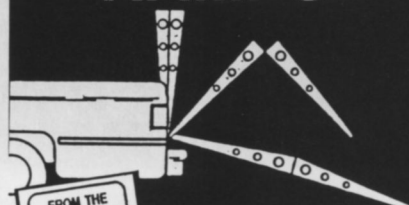
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**Marketing**

(continued from page 60)

and learning who to target with your marketing, are the first critical steps in increasing both sales and profits. Developing and then working a comprehensive marketing plan, based on accurate information, can contribute more

to your success and satisfaction than any other single factor of your business.

In future articles, you'll be given ideas that can help you in the process of evaluating, planning and then implementing your annual marketing plan.

But don't wait to get started. What you do today affects your

bottom line now and tomorrow.

If you don't have a marketing formula, try working through the sheet provided below. Figure your ideal client three different ways: based on revenue, longevity and service calls. Then find the group that fits into all three categories. They're the type you want to market to in the future.

Make copies of this worksheet and repeat quarterly to measure change in your direction. ■

*The author is president of Focal Point Communications, Cincinnati, Ohio. Focal Point designs and produces programs and print marketing tools for green industry clients in 47 states.*

**MARKETING WORKSHEET #1 Measuring Your Customer Base to Determine Your "Type"**

Make copies of this worksheet and repeat the exercise at least quarterly to measure change in your direction.

**YOUR AVERAGE ACCOUNT** is based on over-all company statistics. In this column, calculate the profile of your average customer based on the facts from your whole active customer list.

Total active customers..... \_\_\_\_\_

Total **base program** revenues from active accounts..... \_\_\_\_\_

Total **additional services** revenue from active accounts..... \_\_\_\_\_

Total **square footage** serviced (per round or mowing) ..... \_\_\_\_\_

Total **service calls** run last 12 months ..... \_\_\_\_\_

Total of these service calls converted to sales ..... \_\_\_\_\_

Number of **referral sales** last 12 months ..... \_\_\_\_\_

Total **new clients** last 12 months ..... \_\_\_\_\_

Total **cancellations** last 12 months ..... \_\_\_\_\_

Percentage of base cancelled last 12 months ..... \_\_\_\_\_

Average **base program** revenue per active account ..... \_\_\_\_\_

Average **additional services** revenue per active account ..... \_\_\_\_\_

Average **total** revenue per active account ..... \_\_\_\_\_

Average **square footage** per account..... \_\_\_\_\_

Average **yearly service calls** per active account ..... \_\_\_\_\_

Average **service call-to-sale** conversions ..... \_\_\_\_\_

Average **total treatments** received per account ..... \_\_\_\_\_

**YOUR IDEAL ACCOUNT** can be figured from a variety of different criteria. Start with the top 30% of your clients based on total applications received, annual revenues, service call frequency, or a combination of all of these. You can refine your profile from there as you see patterns begin to emerge.

Customers in top 30% of base ..... \_\_\_\_\_

Total **base program** revenues from top 30% ..... \_\_\_\_\_

Total **additional services** revenue from top 30% ..... \_\_\_\_\_

Total **square footage** serviced in top 30% ..... \_\_\_\_\_

Total **service calls** run last 12 months for top 30% ..... \_\_\_\_\_

Total of these service calls converted to sales ..... \_\_\_\_\_

Number of **referral sales** from top 30% ..... \_\_\_\_\_

Total **new clients** last 12 months matching the above ..... \_\_\_\_\_

Total **cancellations** last 12 months from top 30% ..... \_\_\_\_\_

Percentage of top 30% cancelled last 12 months ..... \_\_\_\_\_

Average **base program** revenue per ideal account ..... \_\_\_\_\_

Average **additional services** revenue per ideal account ..... \_\_\_\_\_

Average **total** revenue per ideal account ..... \_\_\_\_\_

Average **square footage** per ideal account ..... \_\_\_\_\_

Average **yearly service calls** per ideal account ..... \_\_\_\_\_

Average **service call-to-sale** conversions per ideal account ..... \_\_\_\_\_

Average **total treatments** received per ideal account..... \_\_\_\_\_

After deciding who your best customers are, try to list as many characteristics about them as possible: concentration by zip code; age; home value; and any other common factors you discover.

N



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S

USE READER SERVICE #25

A LANDSCAPE contractor was well-known by his customers for the time and effort he invested in plant selection, and for the extremely high rate of job referrals received. This contractor told each customer that choosing a tree was as important as choosing a friend; the tree probably would be around longer than the friend and they'd see it more often.

Selecting trees and shrubs for residential and commercial customers is more than a key element in performing your job. It's a far-reaching responsibility. The major plants selected will contribute to the aesthetics and usability of the landscape, the lifestyle of the client, the environment and even the image of the client in the community.

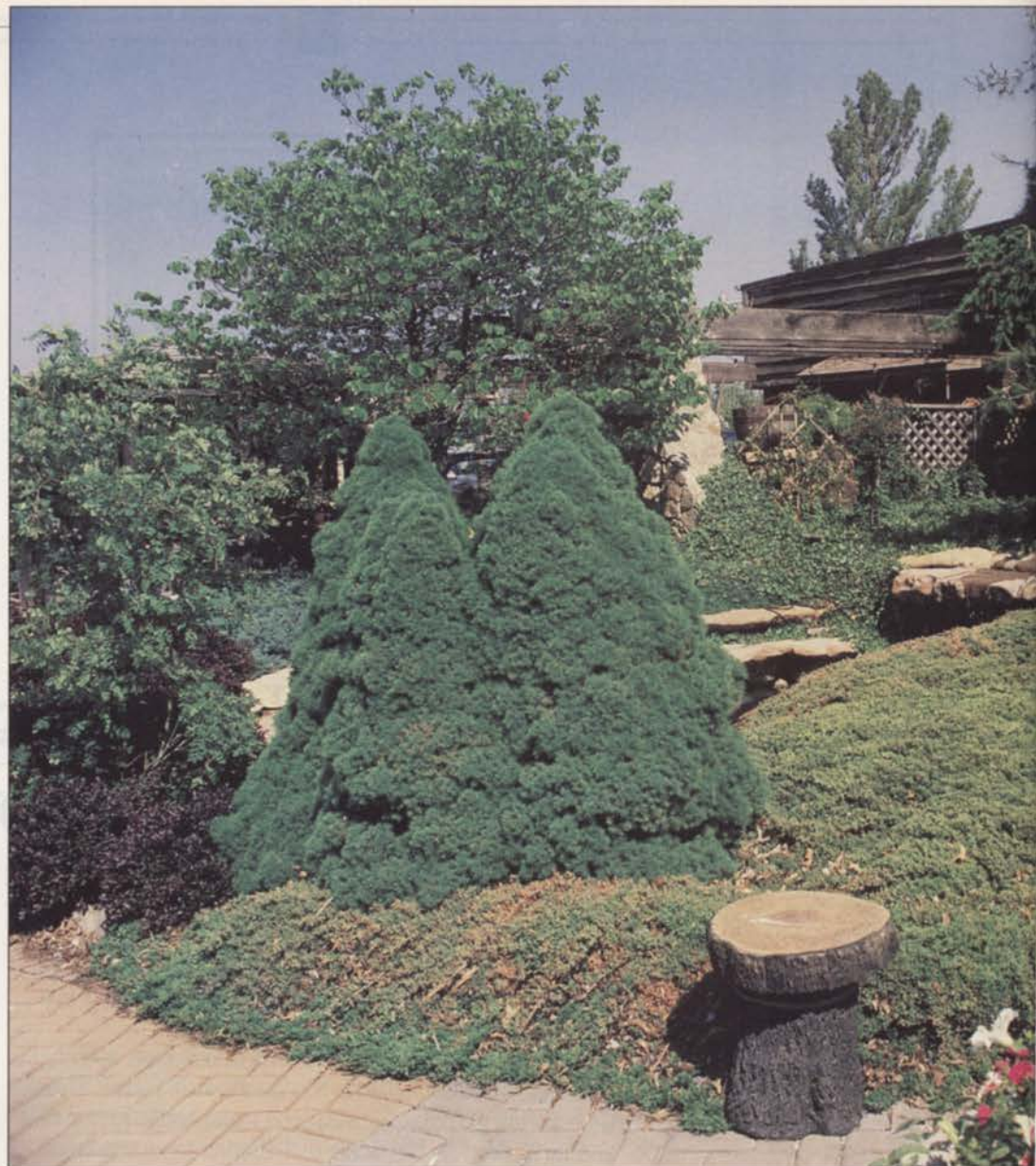
A knowledge of basic horticulture is essential to provide the building blocks on which to base the selection process. A general background in plant care as well as an understanding of a specific plant's growth pattern is required to properly place a plant in a landscape setting.

Appropriate background can be gained through classroom or individual study, seminars, hands-on experience or any combination of these. College or extension service programs are available in most areas. Nursery and landscape associations may offer certification programs with a prepared course of study.

The learning process is lifelong. As with any industry, there are nearly constant changes as technology improves and new products are introduced. Keeping current is part of your job.

As a landscape contractor, you can bring a degree of expertise to the selection process that your clients don't possess. To provide the most beneficial options, you need to get an overview of the plants that will thrive in your region and in the client's particular setting.

You need the knowledge of which plants are being over- and underused locally. You may be called upon to select a single tree



or shrub for a client or to provide the plants for an extensive landscaping. The property involved may be a single family dwelling, an apartment complex, a shopping mall or an industrial park. In any instance, the process is the same.

**CUSTOMER SATISFACTION.** The first step is determining why the client wants or needs a particular plant. Each tree or shrub within the landscape will serve at least one purpose, often more. Ask questions of the client to determine the primary reason and any auxiliary reasons they have for wanting a plant.

You may need to start with an overview, asking the client both how the property is currently being used and how it will be used

in the future. Once general use of the landscape is established, you can focus on the primary purpose of the individual plant.

Will a tree be expected to provide summer shade or to block harsh winter winds? Is the tree primarily for ornamental value? If so, which features are most important—abundant flowering, leaf size and form, fall color, fruiting, foliage retention or branching structure?

Will a shrub be the focal point for a flower bed or hide an unattractive building feature? Is the shrub wanted to attract and harbor birds? Is flowering or fall color a prime concern?

Will the tree or shrub be an individual specimen plant or part of a plant grouping? Will the plant be expected to match or mirror

existing landscape features? Will the use of multiple species be considered?

Are there any restrictions on plant size or form due to zoning ordinances such as setback requirements on plantings bordering roads or sidewalks? Will overhead wires or buried cables limit plant selections and placement?

Consider the surrounding properties. Is the area primarily residential or commercial? Are other buildings similar in size and design to that of your client? Is there an overall style or pattern to neighboring landscapes? Unless your client's property is an isolated country estate or an immense industrial complex, you'll want to choose plants that compliment and add to the look

# Selecting Trees and Shrubs

*Discriminating plant purchasing is a necessary ingredient to satisfying customer needs and ensuring long-term environmental viability.*

*By Steve and Suz Trusty*



Each tree or shrub within the landscape will serve at least one purpose, often more. Photo: Steve Trusty

of other landscapes in the surrounding area.

**PLANT HARDINESS.** You'll need to consider the general weather conditions of the region. This includes the hardiness zones, classified by the U.S. Department of Agriculture, according to the range of average annual minimum temperatures of each area. According to the USDA Plant Hardiness Map of the United States, the continental U.S. ranges from Zone 2 in northern Minnesota where temperatures may drop to minus 40 or 50 degrees Fahrenheit, to Zone 11 in southern California and off the southern tip of Florida where lows are above 40 degrees F.

Rather than a solid band of temperature ranges drawn along straight lines, these zones meander in curves, zags and pockets, matching the altering features of the natural terrain. Catalog listings of plants will give hardiness zones as a guideline. For example, a Bradford Pear (*Pyrus calleryana*) is listed as hardy in Zones 4 to 8, while an Indian Laurel (*Ficus retusa var. nitida*) is hardy in zones 9 and 10.

Along with the zones, plants have varying tolerances for high temperatures, precipitation amounts and timing, humidity levels and frost-free time spans.

Besides the overall weather patterns, each property will have individual weather pockets of slightly varying conditions, called microclimates. These microclimates differentiate between the conditions in an open, sunny lawn and those beneath the shade of a mature tree; between the area bordering the driveway and that along the north side of a building.

The buildings and landscaping on neighboring properties also can affect the microclimates of your client's land. Large buildings and mature trees and shrubs may block

air movement and restrict sunlight. Rows of trees or shrubs may channel winds toward or away from your client's property.

Uneven terrain and the placement of hardscape features such as parking areas, walkways or walls can affect water movement following heavy rains causing washing, standing water or dry spots. Such aspects of the client's property or neighboring landscapes may cause water problems for certain plants. Some plants thrive in wet locations, others must have excellent drainage.

Plants that require large amounts of water should be avoided in regions where water shortages and watering restrictions are frequent, or where water costs are high. Under these circumstances, it is best to select plants from water-wise or xeriscape approved plant lists. Local nurseries, extension services and water districts are all good sources of information in these situations.

Soil conditions also will vary within an area; perhaps within a single property. Soil may be heavy clay, sandy, humus-filled loam or a combination soil. Again, most trees and shrubs have decided pref-

erences as to what constitutes a good growing media. Matching the plants as closely as possible to their ideal growing conditions will eliminate many problems.

## **NARROWING THE SPECTRUM.**

Now you're ready to narrow the plant selection into broad categories. Plants may be deciduous (leaves are lost annually) or evergreen (foliage is retained year-round). Evergreens may be either broad-leaved or coniferous (having cones and needles). Each type of plant has advantages and disadvantages.

Evergreens provide shade and screening throughout the seasons. Foliage color may vary somewhat, but overall stays within a narrow range. Needled evergreens produce seasonal spurts of new growth, usually have inconspicuous flowers and seeds in cone form. Broad-leaved evergreens may have showy flowers and fruit.

Deciduous plants offer variety. Leaves form, develop to maturity, change color and drop. Depending on the region, branches may remain bare for an extended or short period of time. Flowers, fruit and seeds may be showy or inconspicuous.

## NAME THAT WEED



Signalgrass is just one of many weeds that Pennant® prevents. So now you can choke out your worst weeds without beating up on ornamentals and warm-season turf.

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Long-term maintenance must be considered. Is the property owner willing to perform or pay for annual pruning or spraying? Will leaf, flower, seed or fruit drop be of special concern? The showy fruit of a flowering crabapple can be a welcome addition to a homeowner's wildlife sanctuary or a nuisance to employees near an office complex walkway.

By the time you reach this point in the selection process, you'll have narrowed the choices considerably. Your client will have made several basic decisions. For example, the client's specifications may be for a deciduous shade tree with decent fall color in the medium-to-fast growth category with an ultimate height around 50 feet.

Your knowledge of the area combined with a site inspection fills in the gaps of the hardness zone, the soil type, average moisture conditions and any pertinent microclimate information. You'll be able to set further guidelines to conform with the space available, perhaps considering only pyramidal and semi-pyramidal trees with deep-rooting characteristics.

If your client wants a low-maintenance landscape, eliminate trees with heavy fruit or seed production. You'll also avoid trees likely to be prone to insect or disease infestations common to your area.

Next, consider cultural diversity. If every landscape in the area has oak and maple, you'll want to suggest something else such as ash and linden. If your client must have one of the more

Needled evergreens may be an excellent choice to block cold winds or screen frequently used areas. Deciduous plants might be used to provide summer shade for a building's windows, yet allow the winter sun to penetrate to inside the window.

The mature size of the plant and its rate of growth are important factors in the selection process. The 5-foot tall coniferous evergreen that now seems to be the perfect fit for the corner of a house, could develop into a 50-foot giant. Looks can be deceiving, even in photos.

Tall trees with wide, spreading branches could be a hazard over roads, walkways or too close to buildings. Some varieties are sturdier than others, better able to withstand strong winds and storms. Trees that grow rapidly tend to be weaker than slower growing species and less long-lived. They do reach maturity sooner and thus produce results more quickly.

Below-ground root growth is as important as the above-ground height and width of a plant. Some plants have long, tap roots with minor side growth. Other plants have extensive masses of fibrous roots. Some roots reach deep into the soil; others angle horizontally close to the soil surface.

Shallow, horizontal roots can riddle lawn surfaces and tear up sidewalks and driveways. Deep roots may invade sewer systems or damage underground cables. Some trees and shrubs send up shoots from shallow underground roots, in an attempt to reproduce themselves.

## NAME THAT WEED



Redroot pigweed is just one of many weeds that Pennant® prevents. So now you can choke out your worst weeds without beating up on ornamentals and warm-season turf.

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## NAME THAT WEED



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Visit growers' facilities. Talk with company representatives at trade shows. Compare the plants from different suppliers — those put on display at shows and those shipped into your area.

There are many excellent plant suppliers with national and/or regional distribution within the nursery industry. These companies are willing to discuss their growing and handling procedures and explain their choices in variety selection.

If you purchase the majority of your plants from local nursery or garden center stock, become involved in the ordering process early on. Many local companies bring in the bulk of their plants on two basic shipments, timed to coincide with the spring and fall consumer buying cycles.

Orders for spring are usually placed during the late fall and early winter; orders for fall are usually placed toward the end of the spring rush. (Naturally, the timing of orders and shipments will vary with your geographic location.) Orders are placed far in advance of these shipments, but, with computerized inventory control and order tracking, minor adjustments often can be made right up to the time of shipment.

Discuss your anticipated needs with your contacts at the local nursery and with their purchasing agent. Build a good relationship with your supplier. This must be a win-win

*(continued on page 101)*

heavily used species, seek out a different variety or cultivar. Using a wide assortment of plants within an area helps avoid devastating, widespread plant loss due to insects, diseases or unusual weather patterns.

If several plants are to be used together, cultural diversity is still a wise choice. Though a row of trees or a solid hedge of one plant variety can be impressive, the loss of a single plant can destroy the balance of the entire grouping. Using a variety of plants within the group will ensure some variation in size and form, making it easier to replace a lost plant.

Weighing the aesthetics of the landscape, decide what the plant can bring to the overall scene in terms of shape and form, shade patterns, color, texture and aroma. Helping your client choose the most pleasing combination of characteristics for the setting will further narrow the selection process and ensure that the plant will add rather than detract from the beauty of the landscape.

**PLANT VIGOR.** You have the opportunity to connect with the best plant sources whether your company grows the bulk of the plants used from liner stock, or purchases larger stock from national or local suppliers. No matter which plants are selected, it's vital to ensure sources of healthy, vigorous material subjected to as little stress as possible during the developmental stages.

Take the time to learn about your sources.

## NAME THAT WEED



Yellow nutgrass is just one of many weeds that Pennant® prevents. So now you can choke out your worst weeds without beating up on ornamentals and warm-season turf.

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**USE READER SERVICE #85**

# Calculating Compost Capacity

*Being successful in compost use involves applying background knowledge in economics, agronomics and common sense. Ultimate success, however, depends on knowing compost benefits and properly applying compost.*

By Rod Tyler

Landscapers must be cautious about the quality of compost they choose for their various jobs. Pictured here are piles of contaminated compost.



LANDSCAPERS HAVE been increasingly excited about compost over the last several years, and for good reason. Landscapers today are similar to gardeners from centuries past in that they are becoming successful in growing plants by using organic matter more frequently.

The environmental movement has boosted awareness of compost products because of the environmentally acceptable option it provides as a waste disposal alternative. This organic matter is normally tilled into the soil prior to

planting; however, it can be used as a mulch or incorporated post-planting as well.

Consequently, landscapers have found that the increase in available organic matter has improved plant growth anywhere from 20 percent to 100 percent, while maintaining higher than average survival rates. These field results have been replicated in research.<sup>1,2</sup>

Many landscapers are starting to use compost (at a cost of \$8 to \$15 per yard) in place of peat moss which normally costs be-

tween \$20 and \$30 per yard. Compost offers exclusive benefits including an excellent micro- and macronutrient balance, high organic matter content and local availability. Compost is also a replenishable, recycled, natural resource.

The landscaping industry is segmented into many different groups that use compost in a variety of ways. Landscapers, grounds maintenance professionals, lawn care operators and golf courses involved in installation, maintenance or specialty services in any given phase of landscaping have the opportunity to use compost.

Accurately measuring compost needed for these applications is a significant key to success.

**TURF.** Establishment of turf using compost as a preplanting amendment has emerged as a large market for quality compost products. A standard rule of thumb for most soils is to apply a 1-inch blanket layer of compost over the area to be seeded. The 1-inch layer, tilled to a 5-inch

depth, achieves an approximate 20 percent inclusion rate by volume. A 2-inch layer tilled to 5 or 8 inches may be more appropriate for poorer soil conditions with a high percentage of clay.

To accurately calculate compost volumes, the square footage (area) multiplied by the depth in feet, divided by 27 cubic feet yields total cubic yards (which landscapers need to know to order compost).

Compost spread evenly over 1 acre at a depth of 1 inch equals approximately 135 cubic yards. Us-

ing this benchmark, the landscaper can develop a chart (see page 70) to help determine the compost required for various applications including any square footage of turf slated for reseeding.

Calculations become more difficult when the area to be renovated or seeded is not rectangular or square. Common landscape shapes are limited only to the imagination. By using landscape math and remembering high school geometry, most areas can be calculated for total square footage. This process becomes even easier when drawings are completed to scale prior to beginning the project.

For extremely odd shapes, rounding occurs by extending the shape to resemble a calculable area such as a square, rectangle, triangle or circle. Combinations of these shapes usually yield approximate areas.

Topdressing of turf is also a popular practice, accomplished by applying a thin layer of finely screened compost after aeration. Using a "drag unit" pulled behind the topdressing unit, the landscaper or turf manager allows compost to "sift" down into the vacant holes or between grass blades. This process provides air, nutrients and water holding capacity which in turn encourages new root growth.

Topdressing with pure compost or compost/sand mixes after aeration has become an accepted standard practice among many leading turf professionals.

For thatchy turf, it is not recommended to topdress without aeration because the lightweight compost material does not penetrate the thatch effectively.<sup>3</sup> However, by mixing the compost with 50 percent sand, thus increasing the bulk density, penetration of the thatch is improved. An extra bonus exists for lawn maintenance companies or turf managers offering compost topdressing as an extra service.

Compost consisting of a 1-1-1 N-K-P analysis yields 1.2

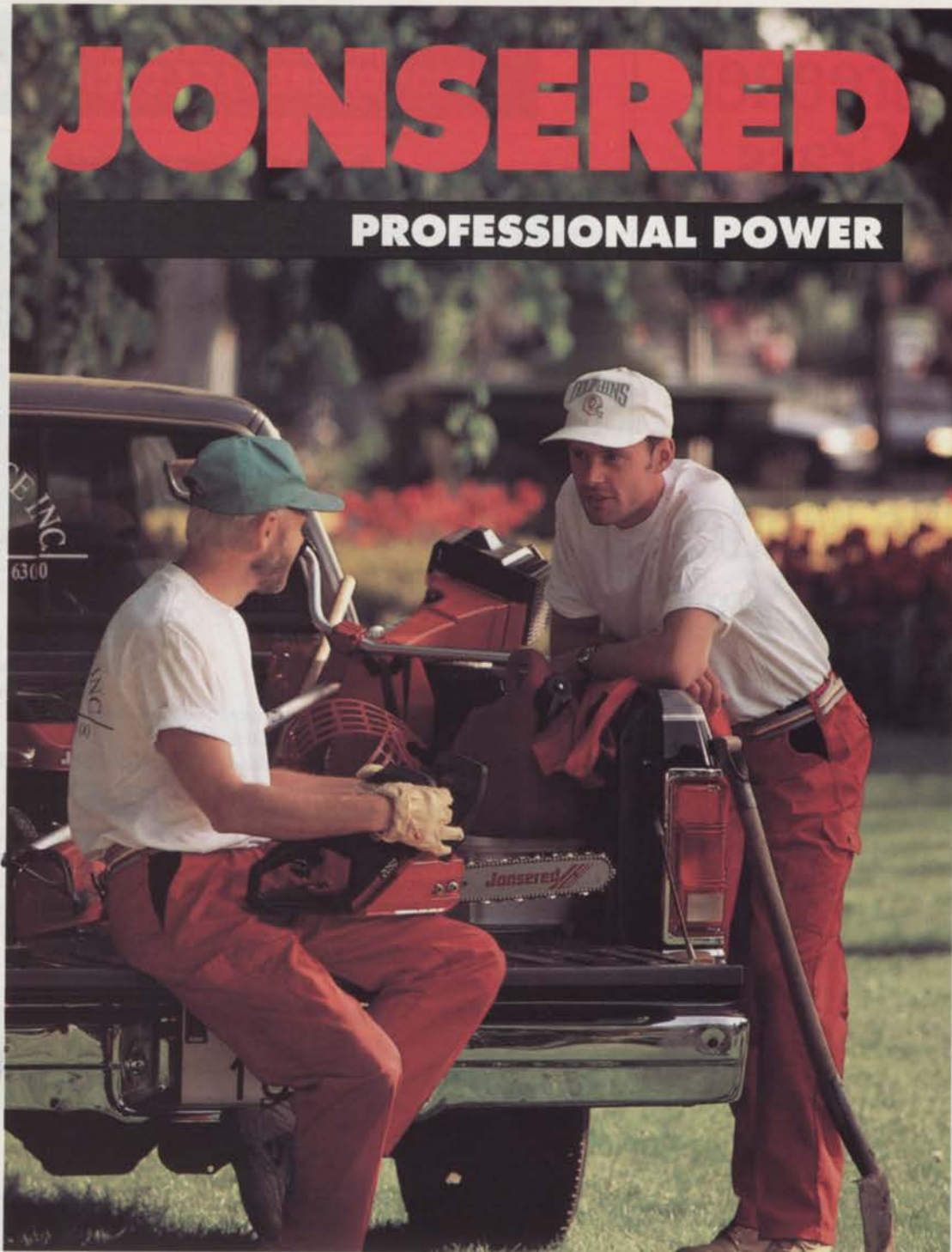
(continued on page 70)



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USE READER SERVICE #84

## COMPOST REQUIRED PER 5,000 SQUARE FEET CUBIC YARDS\*

### Inches of Compost to be Applied

Square Feet	1/4	1/2	1	1 1/2	2
5,000	4	8	16	24	31
10,000	8	16	32	48	62
15,000	12	24	48	72	93
20,000	16	32	64	96	123
25,000	20	40	80	120	154
30,000	24	48	96	144	185
35,000	28	56	112	168	216
40,000	32	64	128	192	246

\*Calculations include rounding off to whole numbers

### Compost Calculations

(continued from page 68)

pounds of available nitrogen per 1,000 square feet at the 1/4 inch application rate.\* Since this is highly adequate to replace a single application of fertilizer, the money normally spent on that portion of the fertilizer program can be applied to compost topdressing programs.

To determine amounts needed for topdressing, the charts on this page can be used to determine compost required for applications. Generally, for mature turf in raised mowing situations (1 1/2 to 3 1/2 inches),

recommendations for topdressing are usually 1/8 to 1/4 of an inch once or twice per season following aeration. Frequency will depend on initial soil condition and amount of thatch.

**PLANTING BED PREPARATION.** Annual and perennial flowers are a colorful part of most landscapes today. In the past 10 years, both have increased in popularity with service-oriented landscapers and especially with do-it-yourself weekend gardeners. In Ohio, perennials are offered at 25 percent of the nurseries compared to less than 5 percent 10 years ago.

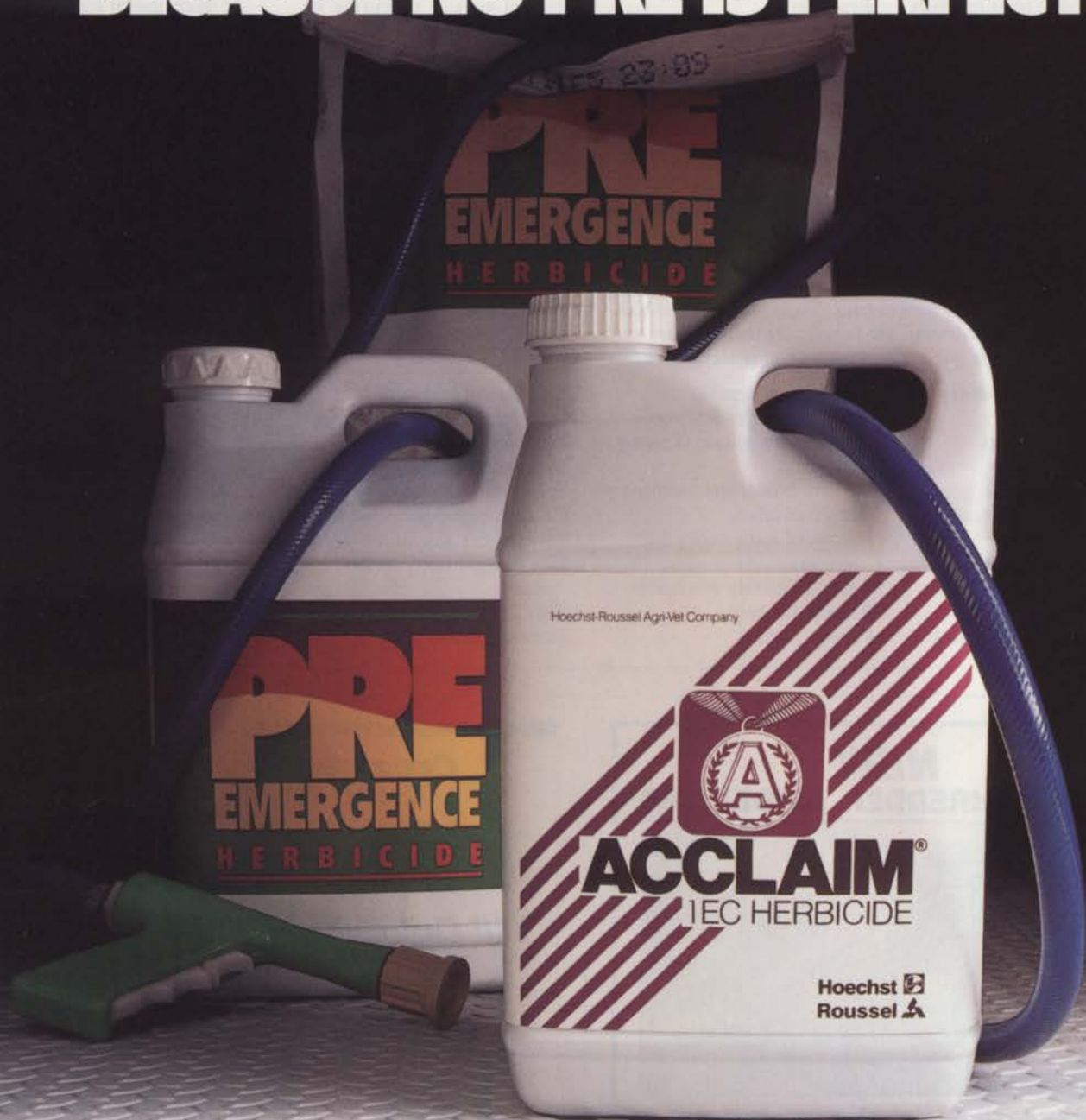
(continued on page 72)

## COMPOST REQUIRED PER ACRE CUBIC YARDS

### Inches of Compost to be Applied

Acres	1/4	1/2	1	1 1/2	2
1	33.5	67	134	201	268
2	67	134	268	402	536
3	100.5	201	402	606	804
4	134	268	536	804	1,072
5	167.5	335	670	1,005	1,340
6	201	402	804	1,206	1,608
7	234.5	469	938	1,407	1,876
8	268	536	1,072	1,608	2,144
9	301.5	603	1,206	1,809	2,412
10	335	670	1,340	2,010	2,680

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**USE READER SERVICE #18**

## Compost Calculations

(continued from page 70)

Locally available plant materials make endless displays of color possible.

Progressive landscapers are currently offering annual or perennial programs whereby they package the installation of annuals or

perennials with a maintenance program, including some type of compost product for planting bed preparation.

The results in both the field and lab are exciting. At the recommended 1-inch compost application rate, research conducted by Dr. Elton Smith at The Ohio State University resulted in an average

dry weight increase of 29 percent for perennials and more than 40 percent for annuals. This study showed equally promising increased growth for annuals and perennials when a 2-inch layer of compost was used as mulch.

Additionally, compost mulch used in annual beds may be rototilled in the fall and ultimately

help build up the soil and naturally set the stage for the following season.

At recent annual and perennial presentations in cooperation with The Ohio State University Cooperative Extension Service, bed preparation was noted to be a key ingredient to success.<sup>5,6,7</sup> Also cited was the importance to test soils regularly to determine background levels of organic matter in native and amended soils.

In short, this annual or perennial program offers additional "menu items" for landscapers to approach potential clients. Consistently brilliant flower color does not happen by chance; instead it is the result of carefully planned and managed landscapes involving the use and regular addition of organic matter.

Successful recipes for annual and perennial beds include 20 percent to 40 percent compost by volume incorporated with native soils, or included in specialized topsoil mix from a commercial supplier.

(continued on page 74)

## PURE BENEFITS OF COMPOST

THE BENEFITS OF using compost have been documented by hundreds of articles, but the original sources of this list, quite frankly, are hard to track. These benefits have been widely associated with proper use of high quality organic amendments. The benefits are listed in mass to reveal the true value compost has when used as an amendment in place of peat moss or other accepted organic alternatives.

- Increases nutrient availability
- Increases CEC
- Increases micronutrients
- Improves soil structure
- Dark color absorbs heat
- Helps suppress plant diseases
- Breaks up clay soils
- Replaces cover crops
- Increases earthworm population
- Helps prevent crusting
- Increases microbial population

- Increases soil aeration
- Makes it easier to pull weeds
- Provides slow release of macro nutrients
- Uniform texture and consistency
- Eases cultivation
- Kills weed seeds during the process
- Works effectively as a mulch
- Reduces leaching
- Reduces erosion

- Reduces soil compaction
- Lightweight and easy to move
- Improves drought tolerance
- May reduce insects
- Helps form soil aggregates
- Contains high organic content
- Easy to work with in wet weather
- May increase safety on athletic fields
- High CEC ties up heavy metals
- Decreases thatch

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## Driveline: Advantage Woods

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## Gearbox: Advantage Woods

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## Cutting: Advantage Woods

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USE READER SERVICE #24

**WOODS**

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## Compost Calculations

(continued from page 72)

Planting beds are all shapes and sizes from squares to S-shapes to triangular. Even though the square footage calculation for these is fairly straightforward, the depth calculation can be misleading. Most planting beds, especially if away from buildings, have a slight crown in the center allowing for drainage and giving the bed a uni-que, uneven depth.

The rounding technique discussed earlier should be applied to arrive at the average depth. Consequently, Chart 1 can be used again to determine amounts needed for average depths in planting bed areas.

### BACKFILL MIXES FOR TREE PLANTINGS.

A landscaper's reputation, in part, lies in the good design of a project, correct implementation, the survival rate of plants and the type of picture the finished product paints. Tree planting has historically been a large part of many landscapes,



Before renovation, dump about an inch of compost on the lawn, rake it out, rototill and seed. Photo: Rod Tyler

especially in large commercial or highway projects where hundreds may be planted at one time.

The larger the number, the

easier it is to see the importance of the survival rate to a landscaper. Many landscape planting contracts are required to include guarantees for plant growth and survival for a minimum of one year. Using compost as a

portion of the backfill mixture has been a popular way to increase organic matter and survivability in tree plantings.

"Practices have changed over the years involving backfill mixes

(continued on page 78)

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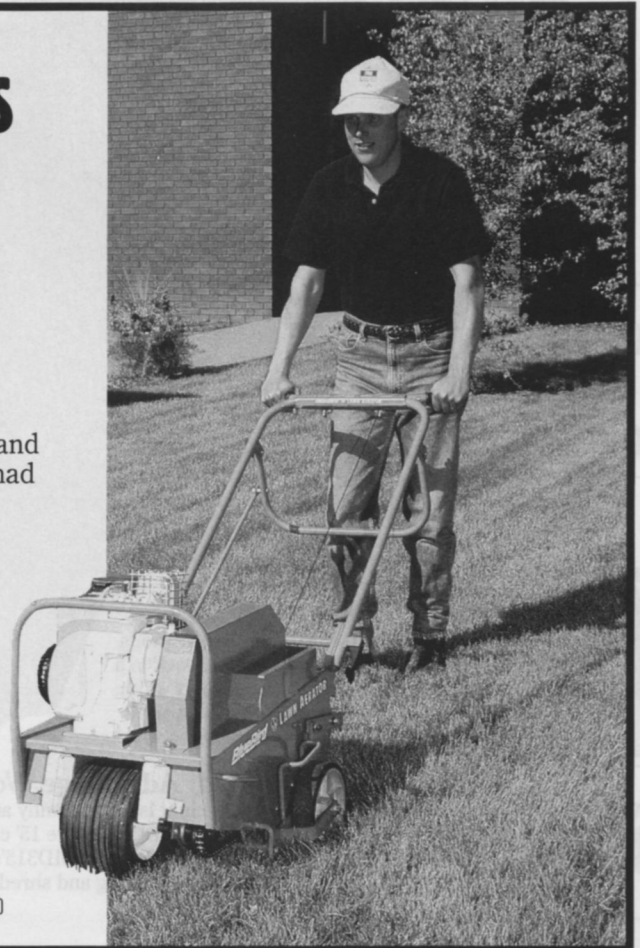
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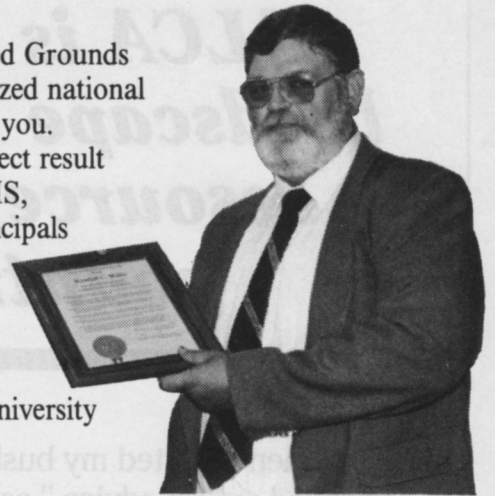
USE READER SERVICE #35

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Randy Willis, CGM  
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\*Conferred by PGMS, grounds manager certification is a program of developing and administering a program of voluntary peer review to establish acceptable competence levels, and to help the grounds professional attain his personal goals.

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## Compost Calculations

(continued from page 74)

for trees," said Dennis Barriball, president of Hemlock Landscapes in Chagrin Falls, Ohio. "Trees and shrubs grown in tough field soils 20 years ago were ready to be re-planted in tough landscape soil situations, but with the soil-less mixes of container grown stocks today, the tender roots are not as adapted to harsh landscape environments. Therefore, more soil amendments are needed."

Changes in tree planting specifications have also resulted, often calling for preparation of 5x the diameter of the rootball instead of the previously accepted 2x diameter. Results seem to be related to preparation and proper amendment use.

Holes dug to accommodate trees have historically been either conical or cylindrical in nature. Loosened soil is removed and compost

## Importing premixed materials allows landscapers to target various pH ranges.

is either mixed with partial amounts of soil or a premixed backfill media and returned to the hole. Guidelines for compost used as backfill media additions are 20 percent to 40 percent of the total volume required for backfilling.

Each plant variety known to man has ideal growing conditions under which it performs best. These conditions are dictated by the type of plant, its native origin and many environmental factors that are always associated with plant growth. Because of the effort required in backfill preparation, many landscapers have opted for premixed materials to be hauled in for convenience. The residual soil excavated from the holes is either spread on a surface or used in other areas on a landscape job.

The importing of premixed materials allows landscapers to target various pH ranges and other specific growing needs for various types of plants they are currently using.

Using composts in normal landscape, grounds maintenance, lawn care or other green industry

operations is more complicated but offers more benefits than people think. It requires a strong understanding of the application of concepts relating to growing plants, mathematics and common sense.

By combining these forces, composts can be used in just about every facet of creating an award-winning landscape. Next time a 50-yard load of compost goes by, consider using 30 yards for the lawn establishment, 15 yards for perennial or annual beds and 5 yards for planting trees. ■

*The author is manager of product and market development for Kurtz Brothers Inc., Cuyahoga Heights, Ohio.*

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IRRIGATION  
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## **ANALYZING IRRIGATION SYSTEM HYDRAULICS**

*Irrigation system design and engineering have not kept pace with equipment improvements. For best results, pressure and flow within the hydraulics should not be overlooked.*

*By Larry Keesen*

HAVE YOU EVER designed or installed a system that had hydraulic problems? Was the pressure too low in some areas? What about the problems you were never aware of, like water hammer, that reduces system life expectancy and causes leakage? If your designs have hydraulic problems you could be held liable for the cost to correct it; think of your reputation.

Client satisfaction, liability issues, water conservation and economics are forcing the irrigation industry to improve the quality of the systems it is using. The quality of the equipment has improved dramatically over the last decade, but the system design and engineering has not improved much.

The key to a good design is to take the time to check the hydraulics for proper pressure and flow. The cost of water and energy make it imperative that the system be designed for efficiency and conservation.

Subsequently, keep the following water data in mind:

1. Water takes the shape of its container while seeking its own level.
2. Liquids are practically incompressible.
3. Water weighs 62.37 pounds per cubic foot and 0.036 pounds per cubic inch.
4. One cubic foot of water = 7.48 gallons of water
5. One foot of head = 0.433 PSI
6. One pound of pressure = 2.31 feet of head

Static pressure is an indication of energy that is available within the system when no flow exists. Static pressure is created by atmospheric pressure exerted on the water surface and the weight of the water above the point of measurement. It can also be created by pumping water into the system.

Static pressure is measured in terms of a column of water exerting pressure through its weight at the bottom of the column, and measured as pounds per square inch (PSI). The formula is simple:

$$\text{PRESSURE} = \text{Weight} \times \text{height of the water}$$

or

$$0.433 \text{ psi} = 0.0361 \text{ lb./cu.in.} \times 12 \text{ cu. in. (height)}$$

*To attain beautiful landscapes, it is critical to design irrigation systems with proper pressure and water flow rates.*

Elevation changes are a major influence on pressure and it will increase or decrease for every foot of elevation change at the rate of 0.433 PSI. You can determine elevation changes on a site by simply attaching a pressure gauge to the end of a hose and reading the high and low pressure points with the gauge on the ground.

Determine the elevation difference by subtracting the low pressure (57 PSI) from the high (65 PSI) and multiplying the answer (8 PSI) by 2.31 which is 18.48 feet of elevation change.

**UNDER PRESSURE.** Operating pressure, also referred to as dynamic pressure and working pressure, is the water pressure at various points within the system when it's operating. Changes in elevation and friction loss (pressure

loss) from water flowing against the surface of its container will cause pressure to vary throughout the system.

The rougher the surface the higher the rate of pressure loss and, as water flow changes direction in fittings and valves, extra turbulence will cause additional losses.

**FLOW PRINCIPLES.** The flow quantity is the velocity or speed of the water and the area cross section within the pipe. Flow quantity is measured in gallons per minute. Flow velocity is a result of available energy to propel the water through the system and the acceleration change due to gravity.

Increased velocity results in a proportional increase in friction loss. There is a direct relationship between the quantity of water flowing and the velocity of flow.



**QUANTITY (gpm) = Area [square feet (sf)] x velocity [feet per second (fps)]**

$$\frac{\text{QUANTITY (gpm)}}{\text{AREA (sf) = (2.45 x diameter squared)}} = \text{VELOCITY (fps)}$$

The velocity of flow through a 2-inch CL 200 PVC pipe (2.15 ID) with a volume of 60 gpm is:

$$60 / [2.45 \times (2.15 \times 2.15 = 4.62) = 11.32] = 5.3 \text{ fps}$$

This is expressed as (see chart above):

Several years ago I did an evaluation for a medical facility that was situated on the side of a hill with 90 feet of elevation change. Drawings of the system were non-existent, four 1 1/2-inch meters served the system and all of the mainline was 2-inch PVC.

The system ran constantly to keep up with the plant water requirements. At first, I thought the water supply was too small but after checking the site peak demand requirements I determined that the four meters were adequate.

As I proceeded with the evaluation, I checked the equipment and measured the operating pressure in each zone. Then I compared the operating pressure of the various zones (8 PSI to 86 PSI) and made allowances for differences in elevation and distance from the sources. I discovered that the operating pressure in this interloped 2-inch mainline was 20 PSI lower, because of friction loss, at the furthest point from the

source without any adjustment for elevation.

The contractor probably used 2-inch mainline on his commercial projects regardless of friction loss, velocity or the size of the project. As the water moved through the mainline, the pressure kept dropping resulting in inadequate pressure for part of the system.

The exception occurred where the mainline was much lower than the source and the pressure was higher, resulting in velocities that were damaging the system.

As water flows through the pipe, the flow is either laminar or turbulent depending on the velocity. Laminar flow occurs when the particles of the water follow separate non-intersecting paths with little or no eddying or turbulence. Turbulent flows see the water swirling and rotating as it moves through the pipe. Laminar flows are generally velocities of 1 to 2 fps and less.

**FRICION LOSSES.** Whenever water is flowing in the system, there is a loss of pressure due to friction with the pipe. This results in an accumulated loss of pressure as the water moves through the system. As the velocity increases the friction loss also increases. Friction loss may be reduced by increasing the size of the pipe, reducing the flow rate, reducing the velocity or using a smoother material such as PVC vs. steel pipe.

Most of the pipe friction loss charts are based on the Hazen and Williams formula. Each type of pipe is categorized by the type of material and given a "C" value which indicates its relative smoothness or roughness. The "C" value for new PVC pipe is 150, for new copper and polyethylene 140 and for steel pipe 100.

The PVC pipe surface is much smoother than the steel pipe. As the pipe ages, rust can occur in steel pipe, corrosion may happen in copper pipe and suspended solids and sand can cause abrasion in any pipe which will reduce the "C" value and increase the friction loss as the system ages (see chart below).



**THE HAZEN AND WILLIAMS FORMULA READS:**

$$0.002083 \times L \times \frac{100^{1.852}}{C^{1.852}} \times \frac{\text{gpm}^{1.852}}{D^{4.8655}} = F \times 0.433 = P$$

- Where:
- F** = Friction loss in feet of head
  - C** = Friction factor for smoothness
  - L** = Length of pipe
  - D** = Inside diameter in inches
  - P** = Friction loss in psi

Friction loss for 100 feet of 2-inch CL 200 PVC pipe with a flow of 60 gpm is:

$$.002083 \times 100 \text{ feet} \times [(100^{1.852} = 5058.25) / (150^{1.852} = 10718.18) = .472] \times [(60^{1.852} = 1963.98) / (2.15^{4.8655} = 41.46) = 47.379] \times 0.433 = 2.017 \text{ psi of loss}$$

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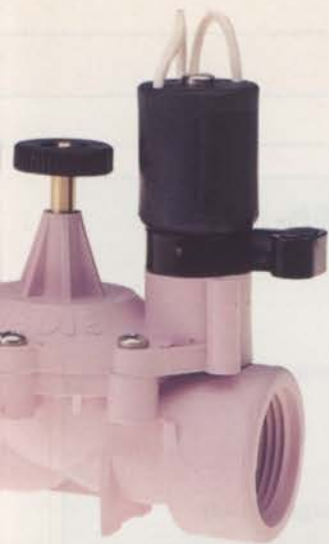
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Many people use the friction loss charts provided in design manuals, but we prefer simple computer programs written in basic to solve these flow loss problems as well as to determine velocity. It is easier to make errors using charts provided in manuals by reading the wrong column, size, chart or picking the velocity instead of friction loss.

Surge pressure or water hammer can damage irrigation systems and reduce system life expectancy. Surge pressure is a series of pressure pulsations of varying magnitude, above and below the normal pressure in the pipe. The magnitude and frequency is dependent on the velocity of flow, size, length and

### SURGE PRESSURE CAN BE CALCULATED:

$$S = \frac{V \times L \times .07}{T}$$

Where: **S** = Surge pressure (additional pressure over normal operating pressure)  
**V** = Velocity  
**L** = Length of straight mainline  
**T** = Time of valve closure in seconds

Examples: 10 fps x 400 feet x 0.07/0.5 seconds = 560 psi surge pressure  
 5 fps x 400 x 0.07/0.5 seconds = 280 psi  
 5 fps x 100 x 0.07/0.5 seconds = 70 psi

material of the pipe. Shock results from these pulsations when the flow of water is stopped in a short period of time.

Surge is often accompanied by a sound comparable to a hammer struck against a pipe, hence the name water hammer. Intensity of sound is no measure of pressure magnitude. Tests show that if 15

percent of the shock pressure is removed by surge absorbers installed in the line, the noise is eliminated but relief from the surge is not enough to protect the system from damage.

Valve closure time is the other key factor affecting surge pressure. Most irrigation system electric control valves have a

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closure time of less than one second. The Center for Irrigation Technology at CSU Fresno, Calif., has tested numerous valves and found the actual closure time to be 0.5 to 0.8 seconds (see chart above, left).

The surge pressure increases proportionally with additional length and velocity. Directional changes within the system will help dissipate this energy, but if the surge is too high, elbows may crack or fittings may be blown off of the pipe. Installing control valves on a riser and elbow above the mainline will also help suppress some of the surge.

Depending on the size of the irriga-

tion system, its best to maintain velocities under 5 fps in most mainline designs. Lateral lines that are drained after each operation can also experience surge, and the velocities should be kept under 7 fps.

Keep this article handy as we continue with pipe sizing techniques, sizing of other system components and total irrigation system losses in the April issue.

*The author is vice president of Keesen Water Management, Aurora, Colo.*



**IRRIGATION QUESTIONS**

1. Will increased velocity result in a proportional increase in friction loss if the pipe size remains the same?
2. Is dynamic pressure an indication of energy that is available within the system when no flow exists?
3. What is the static pressure at the base of a water tower with the water level at 145 feet above the base?
4. Are laminar flows common in most irrigation systems?
5. Does copper pipe have a smoother inside surface than PVC pipe?
6. What is surge pressure?

Answers appear on page 101 of March LLM.

**FINALLY,  
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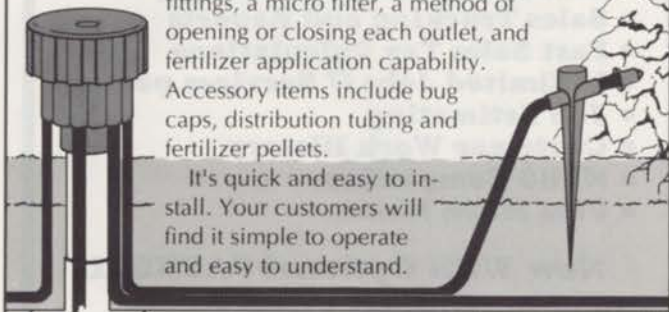
With the VIBRA-CLEAN EH-12 System:

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- Install the stakes and bug caps.
- Turn on the water!

\* Back flow prevention required in compliance with local code.

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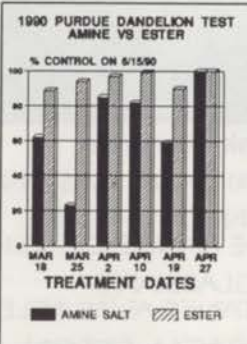
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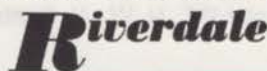
Pennies saved using an Amine formulation in low temperatures could cost dollars in call backs. During cool Spring and Fall conditions, Ester formulations are recommended.



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# Compost Corner

## UNDERSTANDING COMPOST MATURITY

COMPOST IS increasingly demanded by a variety of landscapers, nurseries, greenhouses and professional turf managers. It can be cost-effectively used for its many benefits as a soil amendment or topdressing, often replacing all or a portion of soils, sands or peat moss typically used.

Numerous types of compost are available today, mainly made from yard waste, sewage sludge, animal manures and municipal solid waste. Numerous factors affect the quality of compost. Some factors, such as moisture level, texture and inert contaminants, are easily discernible. Others, including chemical contaminants, weed content, organic matter and maturity, are difficult to recognize and a buyer must depend on laboratory analysis and the producer's reputation to ensure quality compost. Compost maturity, which can affect plant growth, is critical to the end user.

**THE COMPOST PROCESS.** Composting is simply the decomposition of organic matter

### C:N RATIO OF VARIOUS COMPOSTABLE MATERIALS

PRODUCT	RATIO
Sawdust	300-700:1
Paper	150-200:1
Bark	125:1
Leaves	80:1
Food Waste	30:1
Manure	15:1
Grass Clippings	10:1
Humus	8:1

Table 1.

in the presence of microorganisms and oxygen which yields CO<sub>2</sub>, H<sub>2</sub>O, heat and finished compost, or:

organic matter + microorganisms + O<sub>2</sub> -  
CO<sub>2</sub> + H<sub>2</sub>O + heat + compost

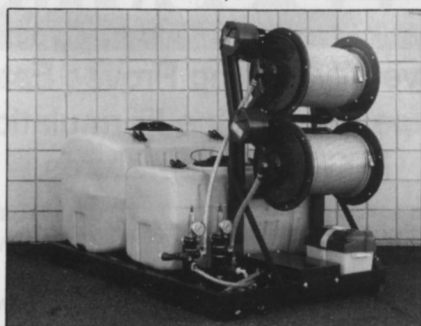
Finished compost retains a high proportion of organic matter, yet resists further decomposition.

The microorganisms responsible for composting require oxygen, plus the nutrients found in the organic matter they decompose. Of all the nutrients, carbon (C) and nitrogen (N), greatly influence the composting process. Microorganisms require C and N in specific proportions to achieve the most efficient level of decomposition and composting.

Table 1 shows the C:N ratio of various compostable materials. Compost operators attempt to blend together different materials to yield a C:N ratio of approximately 30, the ideal point to begin composting. Materials with a C:N > 30 compost slowly, with N being the limiting factor. A low C:N ratio, say five to 10, results in excessive N for microbial use, often producing odors during

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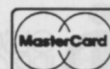
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composting as various N-based compounds volatilize.

During composting, the C:N ratio drops from 30 or higher to about 15 to 18 in finished compost. At this point the compost has completed its very rapid, heat-generating stage and cooled. Peat moss, a stable organic matter which has been decomposing for millions of years, will have a C:N ratio of 12 to 13.

**EFFECTS OF IMMATURE COMPOST.** Immature compost is nothing more than compost which continues to rapidly decompose when moisture, oxygen and nutrient balances favor microbial activity. Using a compost not fully mature can negatively affect plant growth.

A high C:N ratio (greater than 18 to 20) results in continued degradation of the material by microorganisms which steal nitrogen at the expense of plant growth. Immature compost is generally adequate for seed germination or initial plant growth, but shortly thereafter plants show signs of nitrogen deficiency and stunted growth. These problems can be offset somewhat by adding nitrogen fertilizer.

Immature composts, especially those produced under less than fully aerobic conditions,

at times show high levels of organic acids often toxic to plants. In contrast to the high C:N problem described above, organic acids affect germinating seed.

The immature compost often produces offensive odors, especially when the raw materials include grass or sewage sludge. Fully mature compost, no matter what the origin, should have only a slightly earthy odor. Odors in immature compost result from the volatilization of ammonia, amines, sulfur and numerous organic compounds. These odorous materials become stabilized as the compost reaches maturity.

**ENSURING COMPOST MATURITY.** Mature compost ensures favorable plant response and helps avoid odors. There are several ways to determine compost maturity.

The first test is to gauge odor. Mature compost should have no more than a slightly earthy odor. Composts which still smell like sewage or manure, or have a sour, strong ammonia or sulphur (rotten egg) smell, may offend customers.

Physical appearance plays an important role as well. Mature products appear dark in color and show no sign of easily decomposed material (leaves, petioles, etc.). Most

composts contain some materials highly resistant to decomposition, such as small sticks or wood chips used as bulking agents during composting. Small materials are allowable, but screen out large pieces (> 1/2 inch).

Laboratories can run numerous tests on compost to ensure maturity: C:N ratio, plant bioassays and respirometry. C:N ratio should be < 20 and preferably close to 15. Higher C:N ratios may result in nitrogen theft, at which point plants display characteristic nitrogen deficiency symptoms. Thoroughly incorporating the compost into subsoil and nitrogen fertilization helps plants recover.

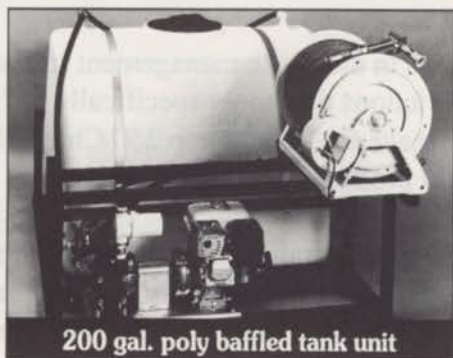
Plant bioassays may help determine the presence of organic acids or other toxic contaminants. Plants sensitive to those materials, such as Cress or Timothy, are germinated in the compost. Germination should be close to 100 percent, otherwise some type of toxic contaminant may show up. These bioassays will not detect an excessively high C:N ratio, however, since seedlings contain enough nitrogen to sustain initial growth. — Jim Wilkinson, Ph.D. ■

*The author is vice president, professional sales and research & development for Earthgro Inc., Lebanon, Conn.*



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# People

VALENT U.S.A. named **Allen Smith** product manager and David Whitehead business manager of its new professional products group.

ISK Biotech appointed **Robert Petersen** turf and ornamental specialist for its Southeast territory. Petersen, who previously served as sales supervisor for the Northern region, handles sales and marketing of turf and ornamental products. **Jean-Claude Lecoq** joined ISK Biotech as regional manager in France, taking charge of strategic developments. Lecoq was director of the agrochemicals department with SNPE chemicals division.

Husqvarna named **Jim Fenner**, **Gary Mason** and **Bill Goodwin** as territory managers. Fenner recruits and serves outdoor power equipment dealers in eastern and central Tennessee; Mason covers central and western New York; and Goodwin is responsible for metropolitan Atlanta and northern Georgia.

O.M. Scott & Sons promoted **Michael Webb** to vice president of business development. Formerly vice president of manufacturing and logistics, Webb continues to

be involved with organics business strategy and the direction of Scott's composting services.

**Dr. Michael Kelty** was promoted to vice president technology and operations at Scotts. Adding to his research, development, engineering and quality assurance responsibilities, Kelty directs fertilizer manufacturing, seed packaging and corporate purchasing.

Also at Scotts, **Kenneth Fritz** will serve as vice president of logistics and operations, assuming direction of distribution, logistics and regional products plant operations.

Turfco appointed **Robert Brophy** director of new ventures. Brophy came to the post from Cushman/Ryan where he was involved in product development and marketing for 17 years.

Conwed Fibers named **Dee Hunter, P.E.**, Southeast sales engineer of its environmental division. Hunter previously held civil and county engineering positions.

Pennington Seed appointed **Dr. Jeff Higgins** head of product development.



Brophy



Ripp

Higgins also serves as director of lawn and garden chemicals, fertilizers and soil products.

**John Ripp** joined Moyer & Son's sales force to handle golf course sales in the mid-Atlantic region. He was formerly a distributor representative in the Chicago metropolitan area.

Briggs & Stratton named **Ed Bednar** marketing manager of its industrial division. Bednar joined the company in 1981 as an engineering intern.

Echo promoted **David Korpieski** to national accounts executive. Korpieski previously served as Southeast regional manager. He now helps develop hardware accounts and specialty distributions. ■



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The crisis in the waste management industry and the restrictions that apply specifically to "green waste" make the AmeriQuip 250 Chip N Mulch the right product at the right time.

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# Products

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The Hydro-Seeder does not require re-lining and lasts longer than plastic tanks. It is available in 1,700- and 3,400-gallon capacities.

**Circle 126 on reader service card**

## PRODUCT SPOTLIGHT

THE U.S. ENVIRONMENTAL Protection Agency registered Ciba-Geigy's Primo, a turfgrass growth regulator used on highly maintained turf.

Primo is formulated for all major warm- and cool-season turf species, including bahiagrass, common and hybrid bermudagrass, centipedegrass, St. Augustinegrass, zoysiagrass, bentgrass, Kentucky bluegrass, red and tall fescue and annual and perennial ryegrass.

At standard rates, Primo reduces turf growth by 50 percent for four weeks, reducing the amount of time required to mow a property or even eliminating some mowing cycles. It becomes rainfast within one hour and is de-activated when it comes in contact with soil.

Primo also serves as an edging material around ornamental beds, trees and curbs. It has no negative effect on non-target plants or trees.

**Circle 125 on reader service card**



**Turplex BioInsecticide** from O.M. Scott & Sons controls surface-feeding insect pests with a botanically active ingredient extracted from the seed of the neem tree.

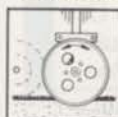
Turplex BioInsecticide stems from the insect growth regulator activity of azadirachtin, a compound found in neem trees, mostly in the seed. Azadirachtin

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controls insects in all larval stages, including the pupal stage.

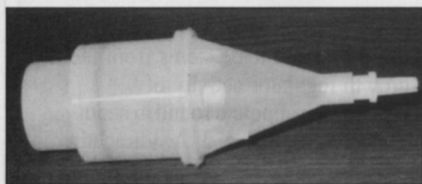
**Circle 127 on reader service card**

**Blue Planet Ltd.** introduces a compost machine that combines the functions of a bin and shredder with the benefits of increased volume and a two-week composting cycle.

The galvanized steel, polyurethane-painted composter produces 16 bushels of finished mulch from 27 bushels of input. The large volume reduces the need for mixing precise proportions of compost ingredients and eliminates the need for artificial catalysts to promote the composting cycle.

**Circle 128 on reader service card**

**Tree Technology Systems** received U.S. EPA label approval for Systrex™/Nutrient, a mixture of Bayleton® fungicide and fertilizer used for administration in Tree

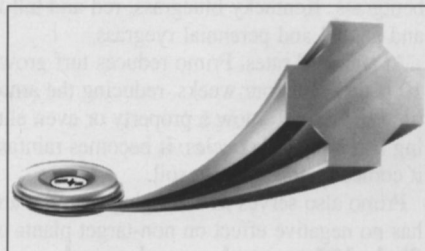


Technology Systems' Arbox micro-injection system.

The label calls for suppression of fungal diseases such as Fusarium spp. and nutrient deficiencies. Tree Technology Systems also offers Systrex labeled for treatment of pine tree decline, a common problem with native Florida pines.

**Circle 129 on reader service card**

The Cross Fire trimmer line from **Echo** features eight cutting surfaces which provide cleaner cuts with minimal brown-



ing. The trimmers' shape allows them to cut at high speeds.

Cross Fire trimmers are constructed of long-lasting copolymer, a material that adds wear resistance to the product. Their multiple surface design produce eight 40-degree edges.

**Circle 130 on reader service card**

**Ameriquip's** Eagle 44, a trailer-mounted aerial lift with a 25-foot side reach and 44-foot working height, features positive bucket leveling, 360-degree continuous rotation and high portability.



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and complete feathering capability. Heavy-duty outriggers are an integral part of the lift. Ease of operation and portability make the Eagle 44 ideal for most maintenance tasks requiring aerial access.

**Circle 131 on reader service card**

**Gandy** introduces the 6500 series drop spreaders which offer precision cam gauge metering for accurate gravity flow applications of fertilizer, granular materials and seeds.



Gandy's drop spreaders are available in three models: the 6504 which is 4 feet wide and has a 260-pound capacity; 6505, which is 5 feet wide with a 325-pound capacity and the 6-foot-wide model 6506 with 390-pound capacity.

The spreaders' bottom and slides feature diamond-shaped openings spaced two inches apart. Two internal rotors are independently driven by pneumatic tires and a hand-operated shut-off gear mounted on a tractor hitch.

**Circle 132 on reader service card**

Under an expanded label recently accepted by the U.S. EPA, **ISK Biotech's** Daconil 2787 flowable fungicide now extends to 55 damaging diseases on 78 species of broad-leaf shrubs and trees, including conifers, as well as foliage plants, flowering plants and bulbs.

On turf, Daconil 2787 is labeled for control of algal scum and a broad range of fungal pathogens that cause dollar spot, brown patch, leaf spot, melting-out, brown blight and other diseases.

**Circle 133 on reader service card**

**Plant-Tone** plant food and soil conditioner for lawns, flowers and gardens features an improved 5-3-3 composition for robust lawns and plants.

Approved for organic gardening, Plant-Tone provides a slow release of nutrients which encourage soil microbe and earthwork activity. It can be applied to new



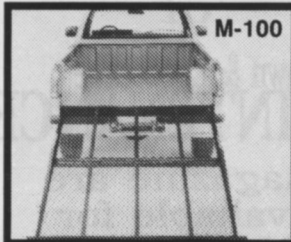
lawns immediately and to established lawns in spring, summer and fall.

**Circle 134 on reader service card**

**Farmland Industries** introduces the Propell Professional Turf Fertilizer line formulated to withstand rigorous growing conditions. Available in six formulations, Propell is ideal for turfgrass areas cut above 3/4-inch.

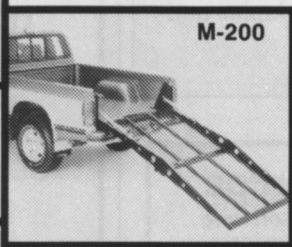
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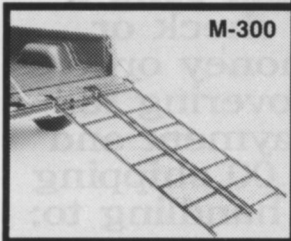
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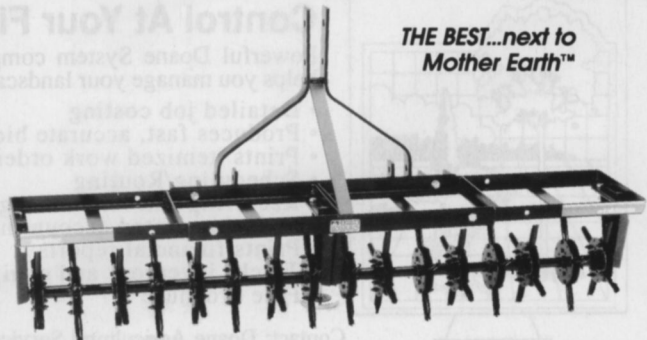
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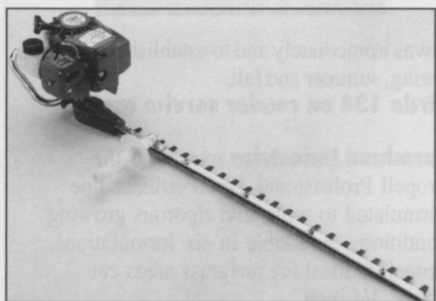
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The fertilizer line includes: Propell Sulfur-Coated Urea (37-0-0), containing 12 percent sulfur; 20-5-10, containing 7.6 percent sulfur, 1.2 percent iron and 50 percent slow-release N; 30-4-8, containing 5 percent sulfur, 1.2 percent iron and 20 percent slow-release N; 12-24-12, containing 4 percent sulfur, 10-10-10, containing 2 percent iron and 4 percent sulfur; and Propell Multi-Purpose Plant Food (16-0-8), containing 15 percent sulfur, 1.5 percent iron, 0.15 percent zinc and 0.10 percent manganese.

**Circle 135 on reader service card**

**Little Wonder** gasoline head trimmers are available with 16- and 30-inch blade lengths that cut growth up to 1-inch thick.



The trimmers' precision balanced design provides comfortable cutting and the fully sealed gas tank prevents leakage.

The two-cycle engine features quick-starting electronic ignition. Gears, blades, gearbox, frame bar and handles are available with a five-year warranty.

**Circle 136 on reader service card**

**J.F. Oakes** Sales & Marketing introduces the JFO Chemtrol, a high-pressure spray hose constructed of chemically stable, electrically non-conductive synthetic compounds, and reinforced with high-tensile yarn.

The lightweight hose features an abrasion-resistant outer covering and a chemical-resistant inner bore that enables the hose to carry a range of pesticides and lawn care chemicals.

JFO Chemtrol has a working pressure of 300 psi. The 4:1 safety ratio allows pressure surges and variations in operating conditions.

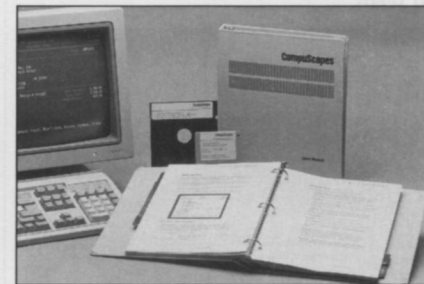
**Circle 137 on reader service card**

The U.S. Department of Agriculture recently issued plant variety protection on **Pickseed West's** Shortstop turf-type tall fescue. Shortstop is a slower-growing, uniform

variety with dark green color and medium-fine leaf texture.

**Circle 138 on reader service card**

**CompuScapes** introduces two accounting modules to complement its existing software. The general ledger and financial statements and inventory management and purchase orders are fully integrated with the main module, which contains job costing, routing and scheduling and estimating,



workorders, invoicing and accounts receivable.

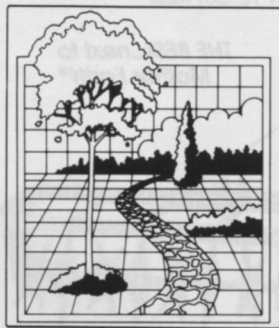
The first of the two modules allows the user to create and print financial statements for the whole company as well as profit and loss reports by cost center. The second module gives the user greater control over inventory.

**Circle 139 on reader service card** ■

## COMING NEXT MONTH

The April issue of *Lawn & Landscape Maintenance* will focus on irrigation in the landscape. From recycled irrigation water to centralized irrigation control, we'll discuss the latest issues in water management. Of course we'll also bring you our ongoing irrigation training series. Next month's topic is designing for drip.

You'll also find features on insecticide performance in turf, computing mower productivity, a look inside Smallwood Landscaping of Naples and the first of our regional market reports.



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# NOTICE:

## Important Information on New 2,4-D Label Requirements

In order to keep the herbicide 2,4-D available to those who rely on it for agriculture, forestry, turf care and roadside and rights-of-way maintenance, the Industry Task Force II on 2,4-D Research Data has reached an agreement with the U.S. Environmental Protection Agency (EPA) to undertake an exposure reduction program while completing overdue scientific studies required by the agency. The Task Force is comprised of the registrants of the technical grade 2,4-D (which appears on product ingredients as some form of 2,4-dichlorophenoxyacetic acid) which manufacture or sell 2,4-D products in the United States: AGRO-GOR, DowElanco, Nufarm USA and Rhone-Poulenc.

The EPA is convening a panel of experts to comprehensively evaluate all pertinent 2,4-D studies, including studies involving long-term exposure. Pending the completion of this evaluation and the evaluation of reregistration studies being performed by 2,4-D registrants, the new practices and requirements described in this program will appear on new 2,4-D product labels. In addition to label changes, a national applicator/user exposure reduction program will be implemented.

Compliance with these exposure reduction measures prescribed on the new labels on products containing 2,4-D is required by law. It also represents common sense and good work practices appropriate to the application of all pesticides.

All 2,4-D applications will be affected by the new label requirements, including agriculture, forestry, aquatics, utility rights-of-way and roadside maintenance, golf course and other turf management, as well as commercial and homeowner lawn care.

Because the greatest potential for exposure to pesticides like 2,4-D occurs during mixing and application, the following measures are designed to reduce pesticide exposure by requiring protective clothing and equipment, and proper hygiene, as well as by restricting the amount and frequency of application, and access to treated areas. While the registrants of 2,4-D remain firm in their support of 2,4-D, they advocate handling pesticide products with care and respect.

The following specific new label requirements for specialty applicators will soon appear on 2,4-D product labels:

- △ For forestry, aquatic, and industrial (e.g., rights-of-way, roadside maintenance, etc.) uses, when mixing, loading or applying 2,4-D products, or repairing or cleaning equipment used with 2,4-D products, wear eye protection (face shield or safety glasses), chemical-resistant gloves, long-sleeved shirt, long pants, socks and shoes. It is recommended that safety glasses include front, brow and temple protection. Eye protection is not required for aerial applicators in enclosed cockpits and applicators applying these products from a tractor that has a completely enclosed cab.
  - For turf applications, mixers, loaders and applicators must wear long-sleeved shirt, long pants, socks and shoes. Users of turf liquid products with "Warning" or "Danger" signal words must also wear eye protection -- a face shield or safety glasses (it is recommended that safety glasses include front, brow and temple protection). Professional applicators of turf liquid amine products must also wear chemical-resistant gloves, except when applying to golf courses. Other applicators of turf liquid amine products must wear rubber gloves.
- △ For all applications, wear coveralls or a chemical-resistant apron when pouring from containers of more than 1 gallon but less than 5 gallons in capacity.
- △ For all applications, a mechanical system ("probe and pump") must be used for transferring the contents of containers of 5 gallons or more in capacity. If the contents of a non-refillable container are emptied, the probe must be rinsed before removal.
- △ For turf and forestry applications, some application rates will change. The maximum application rate to turf is 2 pounds 2,4-D acid equivalent per application per site, or the existing maximum, whichever is lower. The maximum application rate to forestry site preparation will be 4 pounds 2,4-D acid equivalent per acre per application per site, or the existing maximum, whichever is lower. The new maximum application rates will be calculated on the new labels.
- △ Full-yard sprayings for turf ("broadcast applications") will be limited to two per site per year. Applying the herbicide to individual weeds or clumps of unwanted plants as they crop up — "spot applications" — often is enough to control their spread without spraying the entire yard.
- △ Do not apply 2,4-D products in a way that will contact workers or other persons either directly or through drift. Only protected handlers may be in the area during application.
- △ For turf applications, do not allow people (other than applicator) or pets on treated area during application. Do not enter treated areas until spray has dried or dust has settled.
  - For all other applications, do not enter or allow worker entry into treated areas during the restricted-entry interval, which will be indicated on the product label.
- △ Use 2,4-D products only in accordance with their labeling. Some uses of 2,4-D products may be subject to the Worker Protection Standard. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification and emergency assistance. For any requirements specific to your state, consult the agency in your state responsible for pesticide regulation.
- △ For early entry to treated areas that is permitted under the Worker Protection Standard, and that involves contact with anything that has been treated such as plants, soil or water, wear eye protection, chemical-resistant gloves, long-sleeved shirt, long pants, socks and shoes.
- △ For forestry, aquatic, and industrial (e.g., rights-of-way, roadside maintenance, etc.) applications, wash hands, face and arms with soap and water as soon as possible after mixing, loading, or applying these products. Wash hands, face and arms with soap and water before eating, smoking or drinking. Wash hands and arms before using the toilet. After work, remove all clothing and shower using soap and water.
- △ For turf applications, after using 2,4-D products in liquid form, rinse gloves before removing. Remove clothing and laundry separately from other clothing before reuse, and promptly and thoroughly wash hands and exposed skin with soap and water. If clothing becomes saturated, remove as soon as possible and shower.
  - After using the 2,4-D products in granular form, thoroughly wash hands and exposed skin with soap and water.
- △ Do not reuse clothing worn during the previous day's mixing, loading or application of this product without cleaning first. Clothing must be kept and washed separately from other household laundry. If clothing becomes saturated, remove clothing as soon as possible and shower.



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**APRIL 2-4** Associated Landscape Contractors of America Member Tour, San Diego. Contact: ALCA, 12200 Sunrise Valley Drive, Suite 150, Reston, VA 22090; 703/620-6363.

**APRIL 23** Insects that Feed on Trees and Shrubs seminar, University of Florida Cooperative Extension Service, Extension Service Auditorium. Sanford. Contact: Uday Yadav, 407/323-2500, ext. 5559.

**APRIL 24-25** California Landscape Contractors Association Certification Testing, Cuyamaca College, El Cajon. Contact: Kim Heckes, CLCA Headquarters, 2021 N Street, Sacramento, CA 95814; 916/448-2522.

**MAY 2** Update on Biodegradability seminar, held in conjunction with the Chemical Specialties Manufacturers Association's Mid-Year Meeting, Chicago Marriott Hotel. Contact: CSMA, 1913 Eye St. N.W., Washington, D.C. 20006; 202/872-8110.

**MAY 10-14** Trees from the Inside Out lecture series, Dr. Alex Shigo, Bellevue and Portland, Wash. Contact: John Kirkland, 503/254-0482.

**MAY 13** Pesticide Seminar, Phoenix. Contact: Arizona Landscape Contractors Association, 2720 E. Thomas Road, Suite A-205, Phoenix, AR 85016; 602/956-4352.

**MAY 23** Water Quality For Horticulture, University of Florida Cooperative Extension Service, Extension Service Auditorium, Sanford, Fla. Contact: Uday Yadav, 407/323-2500, ext. 5559.

**JUNE 5** Estimating and Management Principles for the Landscape Contractor seminar, Phoenix. Seminar will be repeated June 22 in Tuscon. Contact: Associated Landscape Contractors of America, 12200 Sunrise Valley Drive, Suite 150, Reston, VA 22090; 703/620-6363.

**JUNE 7-8** Management of Environmental Technology conference, University of Tennessee at Chattanooga. Contact: Dr. Phil Kazemsky, 615/755-4121.

**JUNE 10** Cornell Turfgrass Field Day, Cornell Research Plots, Ithaca, N.Y. Contact: Department of Floriculture & Ornamental Horticulture, 20 Plant Science Bldg., Cornell University, Ithaca, NY; 607/255-3134.

**JUNE 22** Diagnosing Landscape Disorders, University Theater, University of California, Riverside. Contact: Ted Stamen, U.C. Cooperative Extension, 21150 Box Springs Road, Moreno Valley, CA 92557; 909/683-6491.

**JULY 8** The University of Georgia Turfgrass Field Day, Georgia Station, Griffin. Contact: The Georgia Turfgrass Association, 404/975-4123.

**JULY 9-10** Second Annual New York ReLeaf, Urban and Community Forestry Conference, Cornell University, Ithaca, N.Y. Contact: Dr. Nina Bassuk, 607/255-4586.

**JULY 14-16** American Sod Producers Association Summer Convention & Field Day, Opryland Hotel, Nashville, Tenn. Contact: ASPA, 703/836-4606.

**JULY 18-24** International Turfgrass Research Conference, Breakers Resort Hotel, Palm Beach, Fla. Contact: Dr. George Snyder, University of Florida, IFAS, Everglades Research and Education Center, P.O. Box 8003, Belle Glade, FL 33430-8003; 407/996-3062.

**JULY 24-29** American Society for Horticultural Science's Annual Meeting, Opryland Hotel, Nashville, Tenn. Contact: Christine Radiske, 703/836-4606.

**JULY 25-27** International Lawn, Garden and Power Equipment Expo, The Kentucky Exposition Center, Louisville. Contact: EXPO 93, 6th floor, 6100 Dutchmans Lane, Louisville, KY 40205; 800/558-8767.

**JULY 27-29** East-Penn Allied Nursery Trade Show. Contact: Pennsylvania Nurserymen's Association, 1924 N. Second Street, Harrisburg, PA 17102; 717/238-1673.

**AUG. 18-19** West-PA Landscape & Nursery Trade Show & Conference, Pennsylvania Nurserymen's Association, 1924 N. Second Street, Harrisburg, PA 17102; 717/238-1673.

**OCT. 5-8** 1993 IPAA Convention, Salishan Lodge, Oregon. Contact: Interstate Professional Applicators Association, P.O. Box 1377, Milton, WA 98354-1377.

**OCT. 9-10** Certified Landscape Technicians test, Sacramento American River College, California. Contact: Kim Heckes, CLCA Headquarters, 2021 N Street, Sacramento, CA 95814; 916/448-2522.

**NOV. 9-12** Turf and Grounds Exposition, Rochester Riverside Convention Center, Rochester, N.Y. Contact: New York State Turfgrass Association, 800/873-TURF, or 518/783-1229. ■

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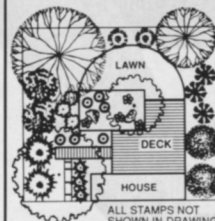
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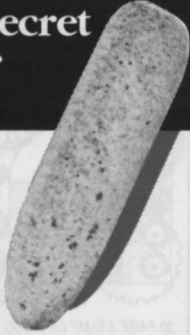
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## Pesticides

(continued from page 36)

and bill bugs, and on ornamental against black vine weevils, strawberry root weevils, fungus gnats and Japanese beetles.

The nematodes seek out and penetrate larvae, releasing a lethal bacteria. The nematodes feed on that larvae and release more nematodes, reducing the need for continuous application.

Miles plans to introduce a new product called Merit, a synthetic turf and ornamental insecticide, in 1994. Though not a biorational, the product utilizes a new class of chemistry called chloronicatiny, which makes it lower in toxicity than many chemicals, said Steve Chaney, Miles' turf and ornamental product manager. Merit, which has contact and systemic activity against a range of insects, should be registered by June and available in limited amounts by year's end.

Other manufacturers are conducting biological research but have not yet introduced products to the market. Dow-Elanco was not ready to reveal any details, said Culpepper. Monsanto is working with Eco-gen in research and development.

Manufacturers concede biorationals have what LCOs may consider shortcomings, such as higher price and lack of convenience. "Biorationals are knowledge intensive. You have to know when to apply them, and be able to scout," Moffitt said. ■

The author is Associate Editor of *Lawn & Landscape Maintenance* magazine.

## Trees & Shrubs

(continued from page 67)

arrangement. You'll need to take the number of plants ordered for you and pay for them according to the arrangements worked out in advance. This way, you can ensure the availability of the types and sizes of plants you use in quantity, and find specific varieties of the less widely used plants that you want to use.

Flexibility helps in this type of arrangement. The nursery may get an order that calls for more plants of a certain variety and size than they can supply unless you relinquish some of your stock temporarily. The nursery may be long on a certain plant that you can help them out by using. If you've built a solid relationship, these factors can be worked out to everyone's advantage.

Selecting the right trees and shrubs for a landscape is more complex than your client's probable concept of walking through a nursery's plant assortment and deciding, "This one looks good." It takes time and effort to learn the basics of horticulture and keep up with technological changes and new developments.

It requires a knowledge of how plants perform in your area and the problems that could occur. Yet, helping your clients choose the proper trees and shrubs can create life-long pleasure — and earn you some excellent referrals. ■

The authors are partners in *Trusty & Associates*, Council Bluffs, Iowa.

## IRRIGATION TRAINING SERIES LESSON NINE

Answers to questions on page 87.

1. Yes

2. No

3. 62.8 PSI

4. No

5. No

6. Surge pressure is a series of pressure pulsations of varying magnitude, above and below the normal pressure in the pipe.

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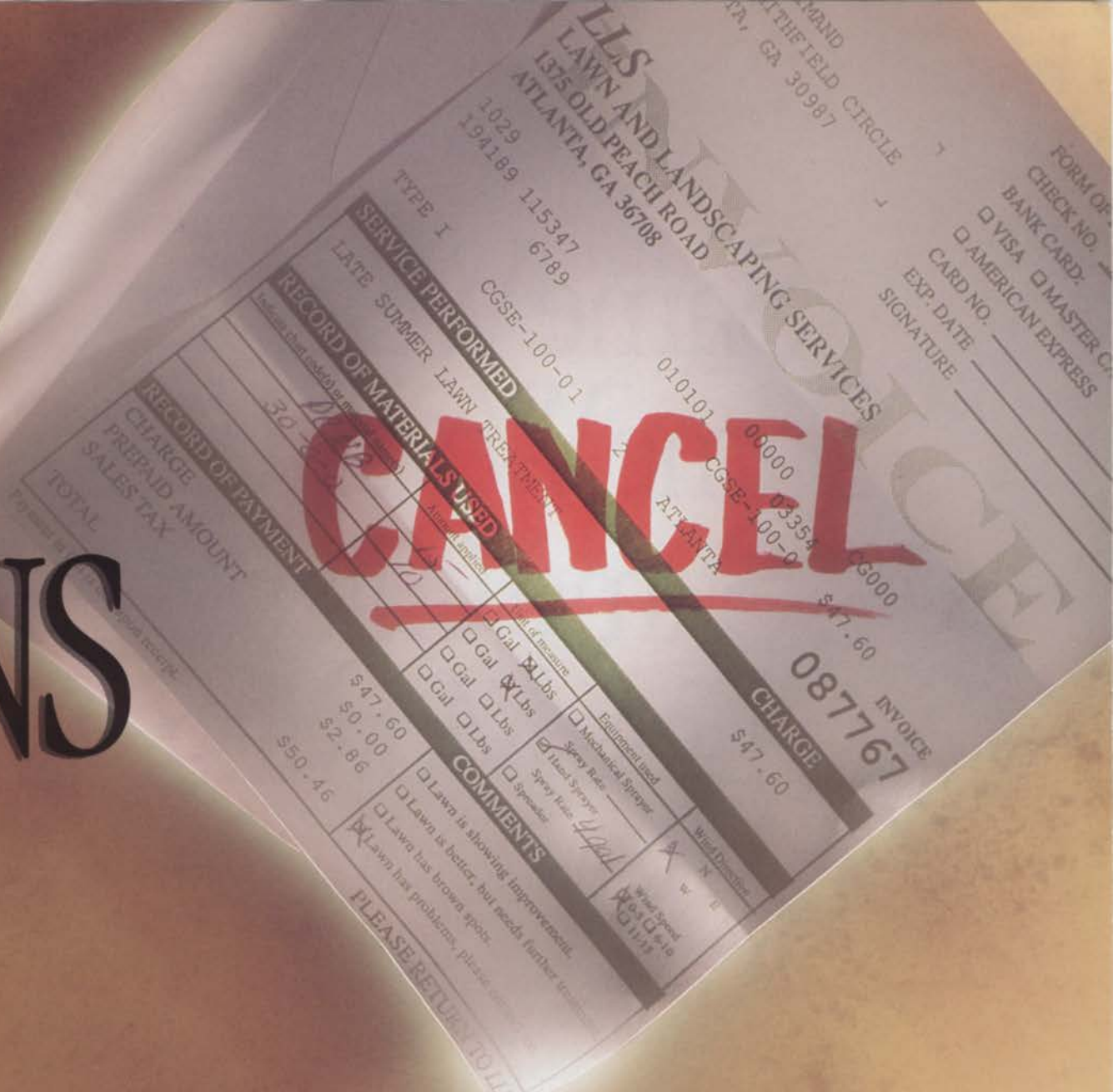
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