

MAY 1994 • \$4.00

# LANDSCAPE MANAGEMENT

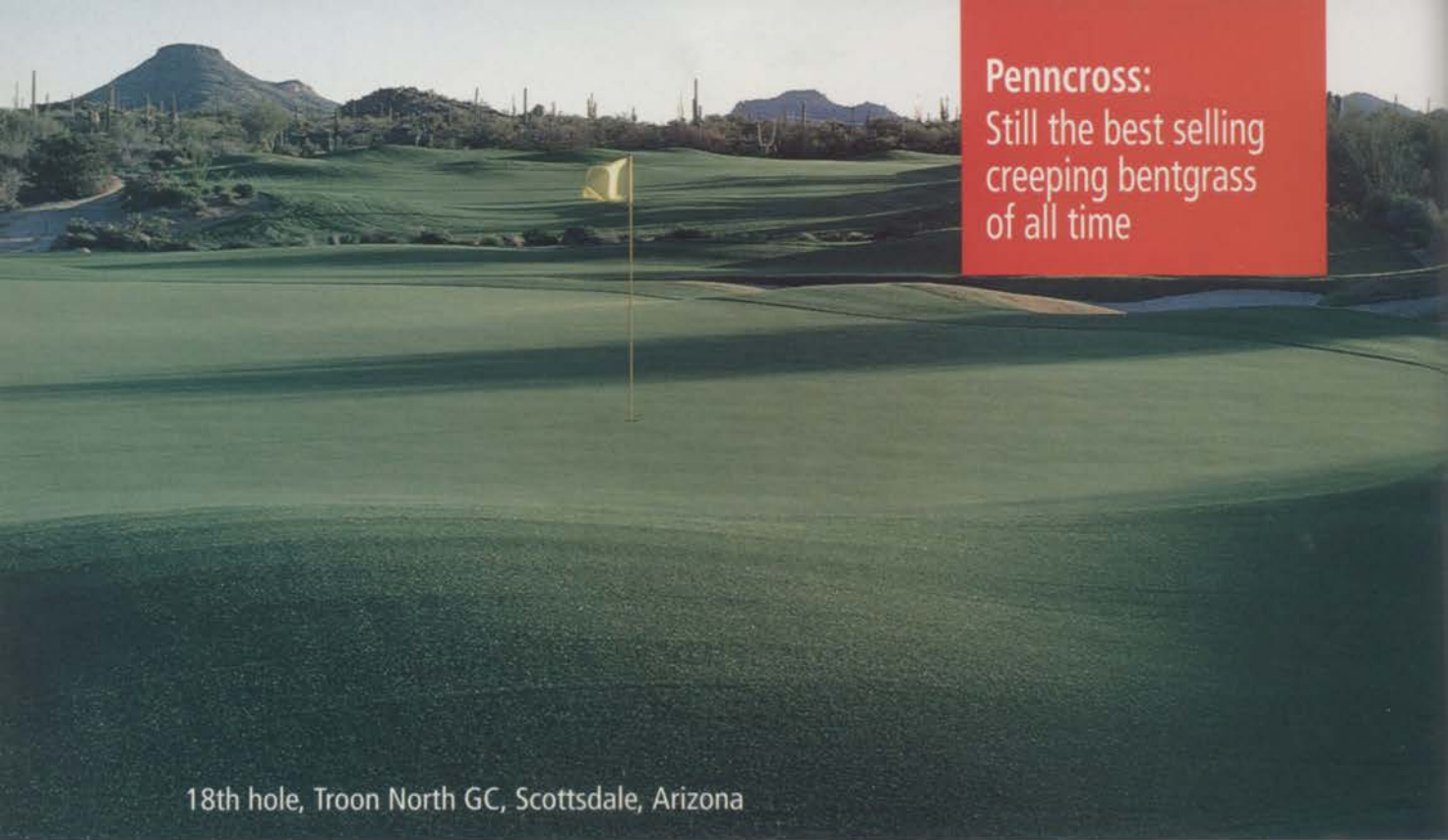
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## AS WE SEE IT

JERRY ROCHE, EDITOR-IN-CHIEF



### Paul Harvey: not one of my favorite radio broadcasters

BACK IN the days when I was commuting 90 minutes to work every day, I made a point of listening to Paul Harvey's news commentaries on whatever Cleveland radio station carried him then.

Actually, I liked his style. He had the unusual ability to electronically transport himself right into the passenger seat of my car. Harvey reeked of intimacy; often injecting words like "friends" ("You know, *friends*, this is something you should think about...") into his commentary.

Normally, I would have been happy to hear that Harvey won a Peabody Award—radio's equivalent of an Emmy—this year.

But I have seen the light.

Harvey, it appears, has some morbid vendetta against the specialty pesticide market and its users, particularly golf course superintendents. Why else would he tell the nation—as he did on February 8th—this?: "Not only are golf course pesticides killing the birds, but they're killing golf course superintendents also."

His comments were supposedly based on the much-talked-about study conducted by Dr. Burton Kross at the University of Iowa (our March issue). But Harvey's commentary was so far off base as to be irresponsible journalism—if you can call his act "journalism" in any sense of the word.

"Your commentary is inaccurate and misleading," Dr. Kross wrote Harvey.

Harvey, after all these years, must realize the power over popular public opinion that he grasps in his microphone every day. So why would he make these irresponsible "quantum leap assumptions" (as charged by RISE executive director Allen James), unless he wanted to deliberately and publicly debase the specialty pesticide industry?

Even after being corrected and castigated by Dr. Kross, Allen James, Joe Baidy (president of the Golf Course Superintendents Association of America) and others, Harvey has yet to issue any public correction, apology, or even a clarification.

Baidy put it succinctly in a letter to

Harvey: "The public relies on the media to accurately report findings. We can only hope that you will highlight this commitment to our members' health, instead of misrepresenting it or diminishing it."

I'VE BEEN out of the mainstream (television and daily newspaper) journalism business for 12 years now. The more I watch local television news and read major metro newspapers, the more I think something in the trade has passed me by.

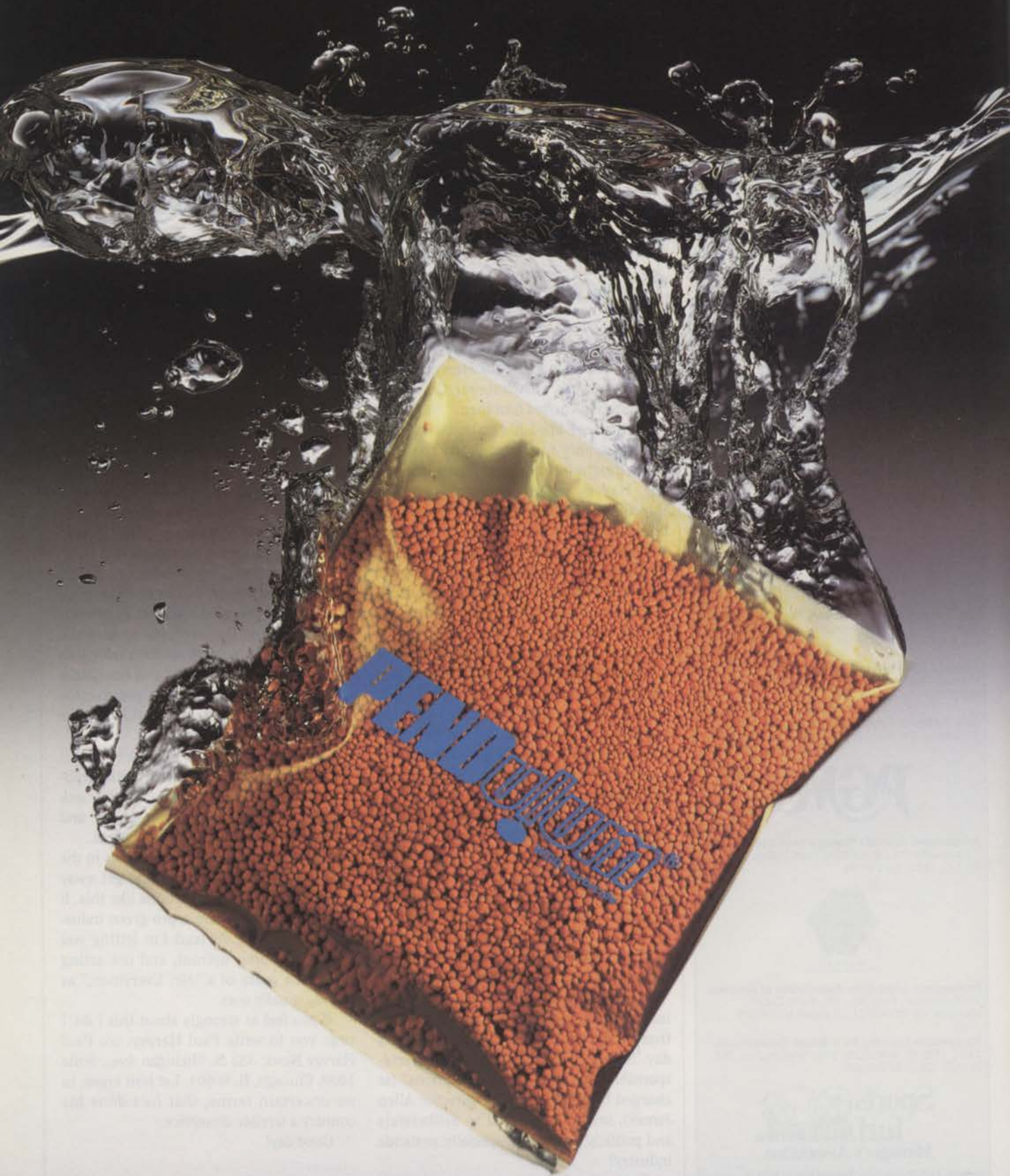
The emphasis now seems to be on *grabbing* the reader, viewer or listener by the scruff of the neck rather than *attracting* him or her. The emphasis seems to be on *creating* controversy (witness television shows like "Current Affair" and newspaper coverage of Hillary Clinton's pre-election experience in the futures market) rather than simply *reporting* on it.

So that must have been what Paul Harvey was doing on February 8th: grabbing his listeners by the scruff of the neck with these irresponsible observations, and then painting a controversial scenario.

As an industry, and as individuals in the industry, we cannot let anyone get away with patently diabolical actions like this. If that sounds like I have a pro-green industry bias, so be it. At least I'm letting you know right now, upfront, and not acting under the guise of a "Mr. Everyman," as Harvey usually does.

If you feel as strongly about this I do, I urge you to write Paul Harvey, c/o Paul Harvey News, 332 N. Michigan Ave., Suite 1600, Chicago, IL 60601. Let him know, in no uncertain terms, that he's done his country a terrible disservice.

Good day!



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# LANDSCAPE MANAGEMENT

'WE KNOW YOUR TURF'

MAY 1994 VOL. 33, NO. 5

## COVER FEATURE

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Adding mower and operator costs will give you a reasonably accurate estimate of how much it costs you to mow by the hour.

*R. K. Reynolds, Ph.D.*

## FEATURES

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A green industry professional looking for a sturdy and versatile machine will find what he's looking for with a good compact tractor.

*Terry McIver*

### 16 Alternative plants

Jeff Jabco of The Scott Arboretum at Swarthmore College offers these ideas for alternative shrubs and trees to add color and diversity to your landscapes.

*Jerry Roche*

### 18 Equipment inventories

How many times have you had to dust off that extra equipment? Probably, not often enough. Sell it or trade it in, says our expert on green industry business practices.

*Ed Wandtke*

### 20 The symptoms of drug abuse

Employer-sponsored programs to help the afflicted can pay for themselves in no time at all.



### 21 Calibration time

It's springtime again. Time to remember that sprayer and spreader settings are there to guarantee accurate and prescribed product application.

*Steve Griggs*

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### 26 Disease control I

New fungicides and disease prediction models highlight this year's disease control update for landscapers in the cool-season areas of the country.

*Gail L. Schumann, Ph.D.*

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Warm-season turfgrass disease is caused by fungi, bacteria, viruses or nematodes. Balance chemical applications with cultural controls, in the interest of efficiency and economy and environmental concerns.

*Bruce Martin, Ph.D.*

### 33 Turf insects in the South

Using a variety of techniques is best for consistent control of turf insect pests in the South, including the 'big three' of grubs, mole crickets and fire ants.

*Pat Cobb, Ph.D.*

## GOLF 'SCAPING

### 42 Aquatic weed control

Aquatic plants are a natural component of the aquatic environment, and therefore necessary. So says Robert Hesser of the Pennsylvania Fish & Boat Commission.

*Jerry Roche*

### 45 Pin rotation

Proper pin placement provides a challenge to the golfer, and helps spread foot traffic around the green. Most systems involve dividing the green into quadrants. Here are some pin placement guides sent to us from two working superintendents and the USGA.

*Terry McIver*

## 48 Knowing your wetlands

You might refer to that often-damp, low-lying patch of ground on your golf course as a swamp, but more likely it's a wetland. Treat it with respect, says Nancy Sadlon of the U.S. Golf Association.

Ron Hall

## LAWN CARE INDUSTRY

## 52 An exhausting road

We lived the ups and downs of an applicator's life on a Columbus, Ohio, property this spring. Ten tips to lawn care applicators, as gleaned from the experiences of a writer spreading fertilizer.

Ron Hall



## HOT TOPICS

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The Associated Landscape Contractors of America has purchased rights to the California Landscape Contractors Association certification test, hoping to create a more credible, professional industry from coast to coast.

Ron Hall

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*On the cover: Chapel Valley Landscape Company, Woodbine, Md., won a Professional Grounds Management Society Grand Award in 1993 for Tysons International Plaza. (Photo by Erik Kvalsvik)*

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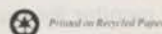
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# ASK THE EXPERT

DR. BALAKRISHNA RAO



## Soil solarization to manage diseases

**Problem:** Would soil solarization work against nematodes and soil-borne diseases on a small, field-grown/container nursery? (North Carolina)

**Solution:** Soil solarization is a simple and apparently effective alternative way to manage soil-related pests.

In solarization, radiant heat, the lethal agent from the sun, is held in the soil under a polyethylene mulch or tarp. The temperature rises, and kills many pests and weeds to depths of 6-8 inches.

Here are some diseases and nematodes controlled by solarization:

Disease	Crop
verticillium wilt.....	tomato, potato, eggplant cotton, strawberry
fusarium wilt.....	tomato, melon, onion, cotton
pink root rot.....	onion
Southern stem rot.....	peanut
rhizoctonia seedling disease.....	potato, onion, bean (sore shin/damping off)
crown gall.....	walnut
phytophthora root rot.....	ornamentals
nematodes.....	various crops (lesion, root knot, reniform, cyst, sting, ring, stubby root and dagger)

—Source: Auburn University

Solarization will not eradicate the problem, but it will help reduce the pest numbers in the top 6-8 inches of soil. Also, it will not be able to protect the treated site for the next year, or any new weed seeds entering the area.

Here's how it's done:

- 1) Prepare the soil with proper cultivation and moisture.
- 2) Use two layers of thin plastic sheeting separated by a thin layer of air which will increase soil temperature.
- 3) Use a clear, ultraviolet-stabilized plastic tarp (polyethylene or polyvinyl chloride) or sheeting 0.5-4 millimeters thick. Bury the edges to a depth of 5-6 inches for a good seal.
- 4) After solarizing for 6-8 weeks, the treated area can be used for planting and/or placing beneficial biological agents such as fungi, bacteria or nematodes. These are antagonistic agents to some soil pests. For some soils, less solarization time is needed.

## Experiments in crabgrass control

**Problem:** Can we skip the pre-emergence application of Pre-M, applying it instead with Acclaim during the second round in the spring after the crabgrass has germinated? (Pennsylvania)

**Solution:** The conventional method of crabgrass management is to apply pre-emergents before crabgrass germinates. In your area it would be before May 15 in an average year.

It is possible to skip the first-round application of Pre-M. But during the second round, monitor for young crabgrass seedlings. Herbicides such as Acclaim or Dimension can be effective as early post-emergence crabgrass control products. These work best if

applied when crabgrass has germinated and prior to the two-leaf stage of development. As the crabgrass matures, the performance of these post-emergence products may decrease.

Hoechst-Roussel Agri-Vet Co. literature says that Pre-M [2.5 lb./1000 sq. ft.] plus Acclaim [10 oz./1000 sq. ft.] would provide 96 percent crabgrass control as compared to Pre-M alone (84 percent), Pre-M [2.5 lb.] plus Acclaim [1.67 lb.] (88 percent), or 15 oz. of Acclaim alone (84 percent).

According to Hoechst-Roussel literature, the combination treatment of Pre-M plus Acclaim during the second round after crabgrass germination would also have economical benefits.

If you are seriously considering this option, try using a small section of your market and get comfortable with the early post-emergence crabgrass management strategy. The idea looks good.

Besides Pre-M, other pre-emergence products are Betasan, Dacthal, Dimension, Barricade and Ronstar.

## Managing black-tailed deer

**Problem:** Black-tailed deer cause severe browsing damage to Douglas fir. We have used Deer-Away Big Game Repellent material in the past, with some luck. We have heard of a new product, Ro-pel, for deer problems. How good are these materials? (Oregon)

**Solution:** Biologists at Olympia's Forest Animal Damage Research Station recently found that Deer-Away BGR-P—36 percent inedible egg solid in powder form—is more effective than Deer-Away Liquid product. These products have been used in the past for black-tailed deer problems.

Ro-pel is a bitter liquid repellent, newly-marketed in the Pacific Northwest with limited information concerning results.

In the past, deer repellent products were recommended for new growth immediately after budbreak. However, Olympia scientists found that black-tailed deer problems on Douglas fir can be better accomplished when the Deer-Away BGR-P was applied before budbreak. They got better results when 12-inch plastic flags were tied to seedlings just below the terminal bud and then dusting the material onto wet seedlings with Deer Away BGR-P.

In other tests, a yellow, blue or red ribbon around the Douglas fir before applying Deer-Away maximized repellency.

When Ro-pel was used, there is potential to cause burning of dormant needles suggesting that the product could be phytotoxic to new growth on Douglas fir.

Try on a limited scale at first, and read and follow label instructions.

(\*ED. NOTE: Refer to the February, 1993 LM for more on deer control.)

*Dr. Balakrishna Rao is Manager of Research and Technical Development for the Davey Tree Co., Kent, Ohio.*

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# MOWING/JOB-COSTING

by R.K. Reynolds, Ph.D.

## COVER STORY

■ What does it really cost to mow? To begin with, no two businesses are likely to have identical mowing costs. Some may be fairly close to others, but many will be significantly different.

The detailed costs that make up total mowing cost, in all likelihood, will vary widely from one business to another.

Determining the cost to do something is difficult for many managers. There appears to be too much uncertainty, too many exceptions, too many unanticipated events to provide an accurate cost. The whole process is overwhelming.

Your job is to find an approach that works for you. I believe in biting off small pieces—I call it a building block method. It is a complete and integrated system that you can adopt and tailor to your particular needs or situation.

The elements to the system are really

**ADDING MOWER AND OPERATOR COSTS WILL GIVE YOU A REASONABLY ACCURATE ESTIMATE OF HOW MUCH IT COSTS YOU TO MOW BY THE HOUR.**

very simple. Most all questions involve (1) labor, (2) equipment and (3) materials. In addition, any business has something called (4) overhead, and most businesses strive to have something called (5) profit. These major five types of information can be developed using any system that works for you.

**Starting out**—The two major costs that make up total mowing cost are mower cost and operator cost.

Each category can be broken down into detailed costs such as (mower cost) depreciation, interest, gas and repairs; and (operator cost) wages, Social

Security and insurance.

You therefore need a method for doing the best job you can in estimating these costs for your business. If you are interested in arriving at an hourly rate for mower cost that can be used in estimating the cost of particular jobs, Form 1 will give you the means to do that.

Since operator cost is often composed of something more than straight wages—such as the employer's share of Social Security, unemployment insurance, workman's compensation insurance and perhaps fringe benefits—we need another tool that will permit a reasonably accurate estimate to be made of

*continued on page 10*

### FORM 1. ESTIMATE OF ANNUAL MACHINE COST

LINE	AMOUNT
1. Purchase cost .....	\$ _____
2. Salvage value (usually 0) .....	\$ _____
3. Cost to be recovered (Line 1 minus Line 2) .....	\$ _____
4. Estimated years of life .....	_____
5. Hours of estimated annual use .....	_____
6. Cost recovery and interest factor (from accompanying table) .....	_____
7. Cost recovery and interest (Line 3 x Line 6) .....	\$ _____
8. Interest on salvage value (Line 2 x interest rate _____%) .....	\$ _____
9. Insurance, taxes, housing (Line 1 x 4%) .....	\$ _____
10. License (usually 0) .....	\$ _____
11. Total Fixed Cost (add Lines 7 thru 10) .....	\$ _____
12. Fixed Cost Per Unit (Line 11 divided by Line 5) .....	\$ _____
13. Fuel (gallons/hour x Line 5 x cost/gallon) .....	\$ _____
14. Oil, grease, anti-freeze (estimate) .....	\$ _____
15. Repairs including service labor, tires, etc, (estimate) .....	\$ _____
16. Total Variable Cost (add Lines 13 thru 15) .....	\$ _____
17. Variable Cost Per Unit (Line 16 divided by Line 5) .....	\$ _____
18. Total Annual Machine Cost (Line 11 plus Line 16) .....	\$ _____
19. Total Cost Per Unit (Line 18 divided by Line 5) .....	\$ _____

**FORM 2.  
LABOR COST ESTIMATING WORKSHEET**

Name of employee \_\_\_\_\_ Title \_\_\_\_\_

LINE	COST ITEM	COST TO EMPLOYER
1.	Regular hours (hrs./wk. x no. weeks).....	_____ hrs.
2.	Regular wages (Line 1 x rate/hr.).....	_____ hrs.
3.	Overtime hours (hrs./wk. x no. weeks).....	_____ hrs.
4.	Overtime wages (Line 3 x rate/hr.).....	_____
5.	Cash bonuses.....	_____
6.	Total adjusted cash wages (total Lines 2, 4 & 5).....	_____
7.	Employer's share of Social Security (____% of Line 6).....	_____
8.	Federal unemployment insurance.....	_____
9.	State unemployment insurance.....	_____
10.	Workman's compensation.....	_____
11.	Other.....	_____
12.	Total value of mandatory costs (total Lines 6 thru 10).....	_____
13.	Value of insurance (life, dental, health).....	_____
14.	Retirement (business contribution).....	_____
15.	Uniform (purchase/rental/cleaning).....	_____
16.	Educational expense.....	_____
17.	Transportation (mi./day x no. days x rate).....	_____
18.	Other.....	_____
19.	Total value of fringe benefits (total Lines 13 thru 18).....	_____
20.	Total Labor Costs (total Lines 6, 12 and 19).....	_____ hrs.
21.	Holiday hours.....	_____ hrs.
	Vacation hours.....	_____ hrs.
	Sick leave hours.....	_____ hrs.
	Total hours paid for but not worked (add above).....	_____ hrs.
22.	Total hours (total Lines 1, 3 and 21).....	_____ hrs.
23.	<b>Total Individual Labor Costs Per Hour</b> (Line 20 divided by Line 22).....	

**FORM 3.  
JOB COST ESTIMATE FORM**

TYPE OF MACHINE	COST/HR.	HRS. ON JOB	MACHINE COST	
1. _____	_____	_____	\$ _____	
2. _____	_____	_____	\$ _____	
3. _____	_____	_____	\$ _____	
4. _____	_____	_____	\$ _____	
<b>5. Total machinery cost (add lines 1 thru 4)</b>			\$ _____	
LABOR FUNCTION	COST/HR.	HRS. ON JOB	LABOR COST	
6. _____	_____	_____	\$ _____	
7. _____	_____	_____	\$ _____	
8. _____	_____	_____	\$ _____	
9. _____	_____	_____	\$ _____	
<b>10. Total labor cost (add lines 6 thru 8)</b>			\$ _____	
MATERIALS	QUANTITY	UNITS	\$/UNIT	MATERIALS COST
11. _____	_____	_____ x	_____	\$ _____
12. _____	_____	_____ x	_____	\$ _____
13. _____	_____	_____ x	_____	\$ _____
14. _____	_____	_____ x	_____	\$ _____
<b>15. Total materials cost (add lines 11 thru 14)</b>				\$ _____
<b>16. Total direct cost (add lines 5, 10 and 15)</b>				\$ _____
OVERHEAD AND CONTINGENCIES				
17. General overhead (15% of line 16)				\$ _____
18. Other				\$ _____
<b>19. Total overhead/contingencies cost (add lines 17 and 18)</b>				\$ _____
<b>20. Total job cost estimate (add lines 16 and 19)</b>				\$ _____
<b>21. This job cost per hour (divide line 20 by number of hours)</b>				\$ _____

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1	1.0800	1.1000	1.1200	1.1400
2	0.5608	0.5762	0.5917	0.6073
3	0.3880	0.4021	0.4163	0.4307
4	0.3019	0.3155	0.3292	0.3432
5	0.2505	0.2638	0.2774	0.2913
6	0.2163	0.2296	0.2432	0.2572
7	0.1921	0.2054	0.2191	0.2332
8	0.1740	0.1874	0.2013	0.2156
9	0.1601	0.1736	0.1877	0.2022
10	0.1490	0.1627	0.1770	0.1917
11	0.1401	0.1540	0.1684	0.1834
12	0.1327	0.1468	0.1614	0.1767
13	0.1265	0.1408	0.1557	0.1712
14	0.1213	0.1357	0.1509	0.1666
15	0.1168	0.1315	0.1468	0.1628

**Illustration:**

\$11,500.00	mower purchase price
-1,150.00	salvage ( 10%)
\$10,350.00	capital to be recovered
x .2432	from table
\$2,517.12	annual recovery (12%/6 yrs.)
138.00	12% int. on \$1,150 salvage
\$2,655.12	total capital recovery and interest annually

**COSTS** from page 8

true labor cost per hour. Form 2 will give you the means to do that.

Now, the sum of the mower and operator costs, as derived through this process, will provide a reasonably accurate hourly estimate of the mowing function.

To make reasonably accurate and reliable mowing job cost estimates requires additional cost considerations like the cost to get men and equipment to the job site and a share of the business's overhead expenses (utilities, advertising, office rent, supplies).

Factors that impact significantly on the mowing function cost:

- wages paid;
- purchase cost of mower;
- how long mower will last;
- interest rate used for capital recovery;
- fringe benefits provided labor; and
- actual hours worked per year.

Factors that impact significantly on the mowing job cost:

- all of the above;
- distance to job; and
- level of overhead costs.

The Job Cost Estimate (Form 3) provides

a way to pull all costs together to arrive at a cost estimate for a particular mowing job—which is, of course, greater than the cost of the mowing function alone.

When filling out Form 3, please note that the machinery category should be broken down by type of machine (42-inch walk-behind mower, string trimmer, pick-up truck, etc.). The labor category should be broken down by labor function (mowing, trimming, raking, etc.) and not by individual employee name. You might also note entries for overhead and contingencies. Generally, overhead costs run about 15% of direct costs, which you should add to the total.

I am appalled at the reports about people in your industry who do not know what it is costing them to do a job. Some, I'm told, don't even want to know. In the economic world, such an attitude can be fatal.

—Dr. R. K. Reynolds is associate professor emeritus in agricultural economics at Virginia Tech. This article is excerpted from presentations made at the 28th and 30th Virginia Turfgrass Conferences in January, 1988 and January, 1990.

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### *Cross-Fire® Premium Trimmer Line from Echo. The shape of things to come.*

Not your ordinary line, Cross-Fire's® eight cutting edges shear rather than tear grass. That helps reduce the browning of grass tips for a more professional look. Cutting is easier and faster, too, even in long, thick grass.

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*Cross section of line shows the eight cutting surfaces that shear rather than tear grass.*

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Choose the size you need from .065" to .130" in diameter, and lengths from 40' loops to 5 lb. spools.

This year, don't settle for the same old line.

For the Echo dealer near you, call 1-800-432-ECHO(3246). Or write: Echo Incorporated, 400 Oakwood Road, Lake Zurich, IL 60047.

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*All Echo trimmers, brushcutters and replacement heads are equipped exclusively with Echo Cross-Fire® line.*



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You want your customer to be confident in you and the insecticide you use on her lawn. Confident that it does the job quickly and without problems for today's environment.

SCIMITAR® turf and ornamental insecticide gives your customer this confidence. Applied at a much lower rate than other popular insecticides, SCIMITAR controls major turf insects in seconds. Pests like chinch bugs, sod webworms, mole crickets and ants. And without the odor that often raises a customer's concern.

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**LM REPORTS**

# Compact tractors

**The big advantage is the versatility they offer.**

■ A green industry professional looking for a sturdy and versatile machine will find what he's looking for with a compact tractor suitable for multiple attachments.

The convenience of the 3-point hitch makes a 15-30 horsepower unit able to pull rakes, till, seeder, chippers, reel mowers or backhoes all with the same tractor.

Front-end attachments include brushes, snow plows, front loaders and mower decks. We've collected some of the leading compact tractors available, based on response to an *LM* call for information.

**Cushman's Front Line mowers are designed to handle multiple chores.**



**From Ford New Holland: basic, no-frills power units.**



**John Deere's 755, 855 and 955 hydrostatic compact tractors are diesel powered.**



**Honda H6522: nine forward speeds, three reverse speeds.**



**Steiner's 420 has an optional Quick Hitch attachment.**



**Gravelly features all-gear direct drive transmissions.**



**The Kubota B50 Series is designed to make tighter turns with minimal turf damage.**

*more on page 13*

# COMPACT TRACTORS FOR 1994

Company	Product	Features
Classen Circle No. 311	VB-40 vibratory plow	Attaches easily to most 3-pt. tractors of 18-hp or larger. This unit is designed to bury poly or pvc irrigation pipe up to 1-1/2 inches in diameter, electrical wire or cable 12-inches below ground.
John Deere Circle No. 312	755, 855 and 955	These three hydrostatic compact tractors are all diesel powered. The hydrostatic transmission means the driver has infinite speed selections and easier operation. Dual pedal, speed-and-direction control leaves hands free for steering and operating other controls. Large-capacity oil cooler extends transmission life. Two speed transaxle allows high- and low-range operating speeds.
Ford New Holland Circle No. 313	15-series tractors	Includes 13.5, 23 and 38 PTO hp units. These are basic, no-frills power units, all of which are diesel powered. The company says the 13.5 PTO hp model 1215 is the right size for mowing and landscape management tasks. The 23 hp is powered to accommodate larger rotary cutters. Front end loaders are available for each.
Gravely Circle No. 314	"G" Riding Tractors	All have all-gear direct drive transmissions; no belts to break or replace; rear-mounted engines; speeds from .5 to 8.4 mph. Various attachments are available for landscaping, mowing and snow removal.
Honda Circle No. 315	H6522	Powered by a 22-hp, 3-cylinder, liquid-cooled diesel engine; available in two- and four-wheel drive models; independent mid and rear PTOs; a complete line of Category 1 attachments; nine forward speeds, three reverse speeds.
Kubota Circle No. 316	FZ2400 B50 Series	The FZ2400 is a 24-hp front mower now marketed with Kubota's 20-hp FZ2100 model. It has Zero Diameter Turn and Auto Assist Differential 4-wheel drive. The FZ2400 is ideally suited for all types of commercial and golf course grounds management. The B50 Series—the B1550, B1750 and B2150—is designed with a "bi-speed turn" feature, for a tighter turn radius and minimal turf damage.
Lely Kioti, Inc. Circle No. 317	LB 1914	Has a 3-cylinder, 4-cycle, water-cooled diesel engine, and 19 hp. Shuttle transmission is a convenience feature. The 3-pt. hitch accommodates Category 1 implements and a hydraulic diverting block provides power to the front-mounted implements as well. Has disc brakes and an easy-to-replace oil filter. Power steering assist, turf tires, horizontal muffler and front weights are all optional.
Ransomes America Circle No. 318	Cushman Front Line Mowers	Designed to efficiently handle multiple turf maintenance chores. The tractor is available in three- or four-wheel models with three different engine types: a 27-hp liquid-cooled gasoline engine, 22-hp air-cooled gasoline engine, or a 22-hp diesel engine. Available in either 60- or 72-inch widths. Attachments include a Cushman Core Destroyer, tine rake dethatcher, Promark blower, front-end brush and cloth or hard-frame cabs.
Snapper Circle No. 319	GT180H425K and 485K LT150H422KV;482BV	Kohler engines power the GT series; Briggs & Stratton engines run the LT series; hydrostatic transmissions; infinite speed; 42- or 48-inch decks; headlights; anti-scalp rollers. GT series has cruise control.
Steiner Circle No. 320	Model 420 tractor	Features three engine options, power steering, articulated frame, constant four-wheel drive and low center of gravity. Fully hydrostatic, a single lever control allows a choice of infinite ground speeds and 2-speed transaxles give a choice of high or low range.

Chart/photo source: LM phone survey  
conducted in March, 1994.

# JUST AD



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Roundup Dry Pak measures faster, easier and with more accuracy than liquid herbicides — saving you time and reducing waste. It also eliminates the mess of measuring liquid herbicides. As a result, Dry Pak poses less risk of exposure. If any of the granules would spill, they're simple to clean up.

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## Alternative ornamental plants for northern part of the United States



*Hamamelis x intermedia* 'Arnold Promise'

### Director of grounds for The Scott Arboretum suggests these species.

■ Jeff Jabco, director of grounds for The Scott Arboretum at Swarthmore (Pa.) College, suggests the plants on this and the next page as being "beyond the ordinary" alternative plants.

Earlier this year, Jabco told Eastern Pennsylvania Turf Conference attendees to weigh these factors:

"Pick things with more than one season of interest. Pick something easily available in your area. And make sure to pick insect- and disease-resistant plants, where you can. It'll make your job a lot easier."

—Jerry Roche



*Prunus x incam* 'Okame'

## JEFF JABCO'S ALTERNATIVE PLANTS TREES

SPECIES	NOTES
bottlebrush buckeye ( <i>Aesculus parviflora</i> )	8-12 feet tall and about the same width; very tolerant; good in dense shade or sun; bottle-shaped white flowers; low maintenance; good yellow fall color
river birch ( <i>Betula nigra</i> 'Heritage')	very resistant to bronze birch borer; attractive tan bark
katsuratree ( <i>Cercidiphyllum japonicum</i> )	good street tree, or for parks/parking islands; very drought-tolerant when established; low maintenance; no insect or disease problems; no leaf litter because of small leaves; maroon in spring, golden yellow in fall; nice-smelling leaves; about 40-60 feet tall
Alaska cedar ( <i>Chamaecyparis nootkatensis</i> 'Pendula')	evergreen; can handle moist, humid conditions; usually no insect or disease problems; 30-45 feet tall with a drooping look
white fringetree ( <i>Chionanthus virginicus</i> )	12-20 feet tall; member of olive family; frilly white flowers in late spring, turning to drooping
corneliancherry dogwood ( <i>Cornus mas</i> )	early flowers of yellow/golden color; limbs low; globe-shaped; small red fruit that are edible; fairly attractive bark; few insect or disease problems
hybrid witchhazel ( <i>Hamamelis x intermedia</i> )	flowers early winter through spring; cold tolerant; very fragrant; 'Arnold Promise' is bold yellow while 'Jelena' is coppery colored; 10-20 feet tall
Foster's holly ( <i>Ilex x attenuata</i> 'Foster's #2')	tends to stay relatively narrow; has fine texture, leaves narrower; attractive deep red fruit; no leaf miner problems
goldenraintree ( <i>Koelreuteria paniculata</i> )	street tree in urban areas; very salt and compaction tolerant; yellow flowers drop off in mid-summer; easy to establish; drought tolerant; golden yellow in fall
Yulan magnolia ( <i>Magnolia denudata</i> — <i>M. heptapeta</i> )	yellowish-white flowers are most effective against a dark background; flowers early
star magnolia ( <i>Magnolia stellata</i> 'Centennial')	narrow growth habit; packed with white flowers with a tinge of pink; very few problems
crabapple ( <i>Malus</i> 'Jewelberry')	apple scab-resistant; smaller of crabapples; 8-12 feet tall and same width; small fruit
flowering cherry ( <i>Prunus x incam</i> 'Okame')	smaller of flowering cherries; deep pink flowers; attractive bark; good fall color
yoshino cherry ( <i>Prunus x yedoensis</i> )	25-40 feet tall; wider than tall; pink to white flowers
oriental spruce ( <i>Picea orientalis</i> )	dark green needles; somewhat tolerant of shade; ½-inch needles
sawtooth oak ( <i>Quercus acutissima</i> )	35-45 feet tall; shiny dark green leaves; pyramidal shape

continued on page 18



# KUBOTA RUNS CIRCLES AROUND THE COMPETITION

Kubota's FZ2100 and FZ2400 with Zero Diameter Turn (ZDT) run circles around the competition.

The power in the innovative FZ front mowers starts with 20 or 24 horsepower Kubota liquid cooled diesel engines and continues with the Auto Assist Differential (AAD) drive system that automatically switches between 2WD and 4WD to match operating conditions. With AAD, you get extra power to maneuver easily in wet grass and muddy conditions with the front wheels rotating freely through the tightest turns. The FZ can turn completely around in one spot without damage to the turf, cutting way down the time spent on labor-intensive hand trimming jobs.

For productivity and versatility, Kubota's F-Series front mowers can't be beat. The F2400 is 4WD and 24 horsepower, while the F2100 is available in 2WD or 4WD, and has 20 horsepower. Both have Kubota diesel engines, and are equipped with hydrostatic rear-wheel power steering for easy handling. A wide selection of Performance Matched Implements provide the versatility. They include triplex reel, rotary, flail and mulching rear discharge mowers, rotary broom, leaf blower, snowblower, and front blade. Roomy operator's deck, tilt steering wheel, and excellent visibility increase comfort and productivity.

Your Kubota dealer can show you the complete Kubota turf equipment line with the power and maneuverability to run circles around the competition.



## Kubota®

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Kubota Tractor Corporation,

P.O. Box 2992, Dept. LM, Torrance CA 90509-2992

Financing available through Kubota Credit Corporation.

## SHRUBS

SPECIES	NOTES
butterfly bush ( <i>Buddleia davidii</i> )	can be cut back to 8-12 inches; can grow 6-8 feet tall; blue, pink or yellow flowers
purple beautyberry ( <i>Callicarpa dichotoma</i> )	berries more prominent in fall—a real show; 3-4 feet tall
summersweet ( <i>Clethra alnifolia</i> )	native to wet areas and shade; sun doesn't affect it; good fragrance; 'Hummingbird' stays under 3 feet tall; 'Rosea' flowers are pink
redvein enkianthus ( <i>Enkianthus campanulatus</i> )	white flowers edged in red; narrow and upright shrub; 10-12 feet tall if allowed; brilliant fall color; reddish leaves
dwarf fothergilla ( <i>Fothergilla gardenii</i> )	white bottle flowers, 4-5 feet tall; brilliant fall color; reddish leaves
oakleaf hydrangea ( <i>Hydrangea quercifolia</i> )	good in full sun or full shade; creamy white flowers in summer and large leaves; foliage is brilliant red in fall; attractive brown bark in winter
inkberry holly ( <i>Ilex glabra</i> )	non-descript evergreen shrub; upright-looking; tolerates both wet and dry areas
winterberry holly ( <i>Ilex x 'Harvest Red'</i> )	6-10 feet tall with bright red fruit in fall and winter; other cultivars 3-12 feet and berry color of red, orange and gold.
Virginia sweetspire ( <i>Itea virginica 'Henry's Garnet'</i> )	clump-forming shrub; white drooping flowers; deep red leaves in fall through January
Korean rhododendron ( <i>Rhododendron mucronulatum</i> )	purplish flowers, 4-8 feet tall; great in very early spring
shrub rose ( <i>Rose x 'Bonica'</i> )	no need to spray or deadhead; very nice rose hips stay on into winter; prune every 2-3 years to one foot high
doublefile viburnum ( <i>Viburnum plicatum var. tomentosum</i> )	12-15 feet tall, two rows of white flowers; almost no insect or disease problems; good screening plant
chastetree ( <i>Vitex agnus-castus</i> )	summer purple flowering shrub tall if not cut back; accent plant for perennial gardens; no insect or disease problems

Photo and information source: Jeff Jabco, The Scott Arboretum

## EXCESS EQUIPMENT: asset or liability?

**How many times have you actually used that extra equipment? Best to sell it or trade it in.**

by Ed Wandtke

■ After recently visiting four or five golf courses and maintenance companies, I found enough spare equipment to operate a \$1 million maintenance company or an 18-hole golf course. The green industry is great at keeping equipment manufacturers in business.

There is nothing wrong with buying new equipment if it's needed, but hanging on to old equipment to be used as spares is becoming ever more expensive and risky. Golf course superintendents and landscape/lawn care company owners usually do not realize how much money is tied up in spare equipment.

And frequently, this spare equipment is neglected, stored outside, rather than indoors or under some kind of protective covering.

**Good intentions**—There are various causes and rationalizations for keeping old

*continued on page 20*

**Is it wrong to sell or throw away equipment you may some day need?**





## Either Protect Your Turf, Or Enlarge Your Sandtraps.

Mole crickets. Fireants. Cutworms. Sod webworms. Armyworms. Fleas. Chinch bugs. Wasps. Who knows what they could eventually do to your golf course? Exactly why you should protect all of your greenery with ORTHENE® Turf, Tree



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## EQUIPMENT from page 18

equipment:

1) Your current supplier is not the same one who sold you the equipment years ago.

2) The supplier is offering you almost nothing on your trade-in equipment toward a new item. (Recovering the large amount of money you have in spare equipment is difficult, yet it is possible with some negotiating.)

3) To have it on hand for emergencies, in case a main workhorse breaks down. However, maintenance records of equipment failures over the last 10 years show that equipment is often out of service fewer than 30 days a year.

4) Many owners believe that keeping rainy-day equipment helps handle unexpected weather conditions. But rainy-day equipment needs often fail to materialize. If they do, employees often become more resourceful because no one likes to use the "old" equipment.

5) Some owners find spare equipment provides a buffer to handle unexpected opportunities for new business during a season. But, in reality, opportunities for new business occur an average of just once every three years.

6) An answer I continually hear—and it's not a good one—is that it simply is wrong to throw or sell equipment that you may need some day.

Equipment on the market today is more efficient, safer and superior in performance to models available just two or three years ago. With these many advantages in new equipment, why are owners keeping so much spare equipment around?

Indeed, there may not be a good reason to initially purchase new equipment:

- Much equipment is under-used. Operators get tired, or there is not enough daily work for the equipment.

- Because of technological improvements, many supervisors want to be among the first to own an innovative piece of equipment, even though mowing an acre in 25 minutes—as opposed to 30 minutes—results in little time or money savings.

- Great deals are being offered by some manufacturers, to get people who don't really need the new equipment to buy it.

**Other factors**—Insurance and technological factors are two reasons why you shouldn't be keeping so much old equipment on hand.

Worker's compensation premiums for equipment operators are increasing at rates of 10 to 50 percent. So safety in the workplace is becoming a more important

Spare equipment is not always stored properly, nor is it usually maintained, so it soon becomes useless.



issue in the green industry. Many old pieces of equipment don't have all the safety features of new equipment.

States are more active in identifying jobs that are higher risk, based on a review of claims made or pending. An employer could be held liable for allowing an employee to operate an unsafe piece of equipment (one on which no regular preventive maintenance is being performed).

The high level of employee turnover in this industry causes us to deal with new employees yearly—or even weekly. Accidents are more likely to occur with old equipment, or the resulting quality may not be as high.

**Swap meet**—One solution to the problem of too much old equipment was devised by members of the Ohio Lawn Care Association. They hold an equipment swap meet in the summer. This allows both members and others to purchase at a significant savings equipment that is not in active use. What a great solution: turning scrap into cash before you need to throw it away!

Finally, some of you might opt to sell off old equipment as early as possible, rather than having to pay a scrap dealer to haul it away in a year or two.

—The author is a principle in Wandtke & Associates, consultants to the green industry. For more information, phone (614) 891-3111.

## Drug abuse: watch for symptoms

### Employer-sponsored programs to help the afflicted can pay for themselves in no time at all.

■ The National Institute of Drug Abuse estimates that the current rate of drug abuse among employed persons is 8.2 percent. In the 18-25 age group, that figure rises to 24 percent. The Institute also estimates that 70 percent of current drug users are employed.

In a 1986 survey by the National Drug Abuse Help Line, 75 percent of drug users admitted using drugs while at work.

Signs of drug abuse include:

- lack of coordination,
- reduced motivation,
- lack of attention to detail,
- increased mistakes or accidents,
- wide mood swings,
- withdrawal from fellow employees,
- deteriorating personal appearance and health,
- a disregard for the safety of others, and
- an increase in domestic and financial problems.

Since drug testing programs typically cost between \$500 and \$750 to set up, they can pay for themselves in no time at all. The fee to a private consultant should include:

- 1) drafting a substance abuse policy to fit the needs of your individual company or organization,
- 2) conducting drug education sessions,
- 3) setting up local collection clinics, and
- 4) arranging for laboratory testing and reporting.

A drug test should cost no more than \$25 for non-drivers and \$35 for drivers. The collection clinic will typically charge between \$20 and \$25 for specimen collection. It should take no more than 24 hours to get test results for non-drivers and 48 hours for drivers.

# Spreader and sprayer calibration

**Settings are there for a reason: they guarantee accurate and prescribed product application.**

by Steve Griggs,  
TruGreen/ChemLawn

■ Accurate settings of spreaders and sprayers are based on rates determined through extensive research and testing to be the most effective for the job at hand.

Using less of a control product may make a second application necessary, which is more expensive than doing it right the first time. Using more of the product may cause damaging side effects, which will also be more expensive.

Hand-pressurized and powered sprayers both operate on the same basic principles. Start with clean and well-maintained equipment prior to calibration on both types of sprayers. Calibrate both types using plain water.

Make sure spray tips are clean. Spray water through the tips to visually check the delivery pattern. On individual tips, check for clogging or uneven delivery of material. On sprayer booms, check to be sure that all tips are operating in the same spray pattern.

## Hand-pressurized sprayers

1) Fill the "hand can" sprayer tank with a premeasured amount of water, generally from 1/2 to one gallon.

2) Pressurize the unit. And, be consistent. Always pump 15 times.

3) Once the unit is pressurized, start spraying in a premeasured area of known size. (For hand cans, the best size for a premeasured area is 1000 sq. ft.)

4) Spray the entire premeasured area.

5) Pour the remaining water in the sprayer into a clean container, and measure the amount.

6) Subtract the remaining liquid from the initial volume. The difference is the amount of material actually sprayed, based on the walking speed of the person doing the spraying and at the pressure level at which the sprayer was set. This determines the amount of liquid sprayed per the premeasured area of the site.

Change those tips showing a significant variation in the pattern.

Drop spreaders deliver material along the base of the hopper directly to the ground below.

Centrifugal spreaders deliver granular material from the base of the hopper onto a dispensing device that rotates, throwing the material in a curving pattern over a distance to the right, front and left of the spreader hopper.

When calibrating either type, always start with clean, well-functioning equipment.

Have a pre-measured area of known dimensions. Calibrate the equipment with the material that will be applied. Use an amount of material realistic for the size of the spreader, enough to achieve a proper flow.

Large, pull-behind spreaders are calibrated in the same manner as smaller, walk-behind units, but on a bigger scale. Because it's difficult to empty a bigger hopper, the material that's left in the hopper usually can be determined from measurement markings inside the hopper or from the difference in starting and ending weight of the total unit.

Because each person walks at a different rate of speed, each sprayer operator should calibrate walk-behind spreaders or hand-carried sprayers individually to arrive at an accurate calibration. Using a tonal stop-

watch can help set a more consistent walking speed for all personnel.

Once calibrations are set, cross check them throughout the day. Ideally, this would be done at the beginning of each application. Realistically, check once or twice during the day on areas where landscape measurements are known to ensure accuracy.

Accurate application is to everyone's benefit. Proper applications correspond with researchers' best advice. Doing it right the first time will reduce call-backs, and dollars will not be wasted.

—The author is branch manager of the TruGreen/ChemLawn San Diego branch, and a member of the California Association of Production Agriculture and the Southern California Turf Council. Stephen Guise of the STMA helped arrange this article.

## Power sprayers

The area to be pre-measured for calibration of power sprayers should be based on the width of the spray boom. The measuring area should give the equipment a "straight shot" run for at least a 50-75 foot length, a span appropriate to the type of sprayer being calibrated.

1) Set the machine to the proper spray pressure. (Use a measuring container to determine the output of each nozzle at pressure. Write down the output of each spray tip over a specific period of time, such as 10 seconds.)

2) Compare the recorded output figures. Replace any tip that has a variance of plus or minus 10 percent, and repeat step one. Continue changing tips until all are within the acceptable less than 10 percent range.)

3) Check the sprayer to assure proper operation. Then power up the equipment so it is running at proper spraying speed by the time it enters the premeasured area.

4) Drive the unit over the area, turning the sprayer on and off while at operating speeds. Set the speed on the equipment drive, then drive the equipment over the designated area and time the spray interval from the beginning to ending point.

5) Repeat this procedure three times to ensure accurate measurement of time and distance.



Repeat the procedure three times to develop consistent results. Always calibrate and spray under standard conditions, (i.e., wind speed at 10 mph or less).

continued on page 24

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**19**

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DYLOX® insecticide controls all species of white grubs in as little as 24 to 48 hours. It doesn't waste time. Then it doesn't hang around.

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For more information, contact Miles Inc., Specialty Products, Box 4913, Kansas City, MO 64120. (800) 842-8020.

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6) Now that you have determined the time it takes to cover the premeasured area, measure the volume of output from each spray tip for that same time interval. Add the total output from each of the tips to find the total liquid spray rate. That total is the volume of spray that actually will be delivered over the designated area.

Repeat the procedure to ensure consistency and accuracy.

Now that you know the calibration volume, you can mix according to the calibration rate. To fill a power sprayer with a known output, say 100 gallons per acre, read the product label to find the amount of material that should be applied per 100 gallons or per acre.



## Drop spreaders

1) Place the material in the spreader hopper. Start with some calibration number or letter. This will be easier if you have some experience with the material, or if the product label gives a suggested calibration setting. Otherwise, the starting point is a random choice.

With drop spreaders, there are devices that can be attached to the base of the spreader to collect output to measure for calibration determination.

Without such a device, use plastic sheeting or butcher paper to collect the material.

2) Walk a known, premeasured distance over this material, opening and closing the spreader while walking at a normal,

steady pace.

3) Gather the material spread; pour it into a measuring device and weigh it. Be sure to deduct the weight of the measuring device from the total.

Once you know the rate at which the spreader is delivering material, you can compare that rate to what the rate should be. Use the following formula:

**rate x area ÷ analysis of material**

4) Adjust the calibration number or letter up or down until the proper output rate is achieved. Once that calibration has been reached, repeat the measurement process two or three more times for consistency and accuracy.

## Centrifugal spreaders

Several types of centrifugal spreaders have varying kinds of adjustments of distribution. The distribution pattern should be consistent, not skewed to the right or left. The peak of the pattern should be aligned with the center of the spreader.

It may be difficult to determine if a spreader is throwing more heavily to the left or right by sight alone. There are more kits available to measure the patterns of some spreaders. For an accurate check without using a kit, run the spreader across a series of grids that reach across the distribution swath to catch the material delivered. Measure the material caught in each container to determine inconsistency.

Most centrifugal spreaders will have some form of adjustment to correct pattern skew.

1) When checking calibration, use a sufficient amount of material to ensure proper flow. Weigh the amount of material put into the hopper. Make a "best guess" on calibration setting,

starting with product label recommendations if these are

available.

2) To cover the premeasured area, work from the outside pass to the inside pass. Open and close the spreader while moving at a normal, consistent rate. With centrifugal spreaders, the speed of movement is important. The faster the spreader moves, the farther the material is thrown. At a slower rate of movement, less area is covered with each pass and a heavier rate of material is applied. The average swath—and, therefore, the average pass—is six to eight feet.

Position each pass so that the leading edge of the swath of the material applied is thrown back to the wheel prints of the previous pass.

3) Once the area has been covered, pour what's left in the hopper into a measuring device and weigh it (subtract the weight of the container).

4) Subtract the amount of material remaining from the amount initially placed in the spreader. Compare the amount of material actually applied to the label application rate. Use the formula shown for drop spreaders.

5) Reset the application rate up or down to get proper calibration rate for accurate distribution.

6) Once the accurate setting has been reached, repeat the procedure two or three more times to ensure accuracy.

Because material will be applied with each checking process, have multiple premeasured areas on which to apply products.

If a deflector shield is to be used for the outside pass with a centrifugal spreader, *check calibration with the deflector attached*, and make any needed adjustments.



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## Disease control in cool-season grasses

### New fungicides and disease prediction models highlight this year's cool-season disease control update.

by Gail L. Schumann, Ph. D.,  
University of Massachusetts

■ Before the current wide selection of fungicides was available, cultural methods were the mainstay of disease management. Today, cultural practices are still the foundation of disease management. Keep in mind, however, that resistant cultivars and biological controls will always perform best when integrated into a sound cultural program.

**Stress factors**—Cultural practices have two primary goals:

- minimize turf stress
- minimize opportunities for disease-causing pathogens to infect turf.

Stress can be reduced with balanced fertility and special attention to nitrogen levels. Most turf diseases are described as being either "low nitrogen," (dollar spot, red thread, anthracnose) or "high nitrogen" (brown patch, pythium blight, leaf spot). Stress reduction alone can raise or lower disease severity.

Soil factors such as drainage, pH, compaction and thatch are directly and indirectly involved in disease severity. The patch diseases (necrotic ring spot, summer patch, take-all patch) and pythium root disease are all associated with these stress factors. On putting greens, raising the mowing height, even temporarily, will reduce these and other diseases.

**Summer patch breakthrough**—Recent research at Rutgers University offers a new approach to summer patch control.

Summer patch is caused by a fungus that infects the roots. Ammonium sulfate, which reduces soil pH, reduces summer patch in Kentucky bluegrass and annual

bluegrass. Ammonium fertilizers have been recommended for many years to reduce take-all patch of bentgrass, also caused by a similar root-infecting fungus.

**Some factors**—To achieve the second goal of minimizing disease-causing pathogens, temperature and moisture must be considered.

Many fungi grow best at certain temperatures, so the disease they cause often occurs at similar temperatures. Red thread and leaf spot are most common in cool weather, but pythium blight is observed only in very hot weather. Although turfgrass managers cannot control the weather, they can minimize moisture.

Fungi need water to live. The longer water remains on the leaf blade, the more severe most diseases will be. Here are some additional hints:

- For lawns and larger landscape areas, careful irrigation timing can minimize leaf wetness and reduce diseases. Pruning and thinning trees and other landscape plantings to increase air flow will help to dry turf quickly.

- Mow turf only when it is dry.
- On golf courses, remove dew by whipping or early morning mowing.

**New fungicides**—Two new fungicides are available for turfgrass. Flutolanil (Prostar 50WP, from AgrEvo) is labelled for diseases caused by basidiomycete fungi such as brown patch, fairy ring, gray snow mold, red thread/pink patch, southern blight and yellow patch.

Cyproconazole (Sentinel 40 WG, from Sandoz) is a new triazole fungicide in the sterol inhibitor (DMI) group. It has a broad label for many important turfgrass disease.

Some familiar fungicides will no longer be available for turfgrass managers after current supplies are exhausted. The makers of anilazine (Dyrene) and the mercury compounds will not seek re-registration.

Mercury compounds have been restricted-use products in a number of states. They were labelled only for snow mold on golf greens and tees.

Benomyl, which has been sold as Tersan 1991 and some other products, is

no longer available for use on turfgrass.

**Fungicide resistance**—Resistance to disease control products is still of concern, even though the problem occurs primarily on golf courses where repeated fungicide applications are made. Resistance has been observed mostly where fungicides from the same chemical family were used repeatedly and exclusively. The most significant problems have been with pythium blight (with metalaxyl), dollar spot and pink snow mold (with fungicides from several chemical groups).

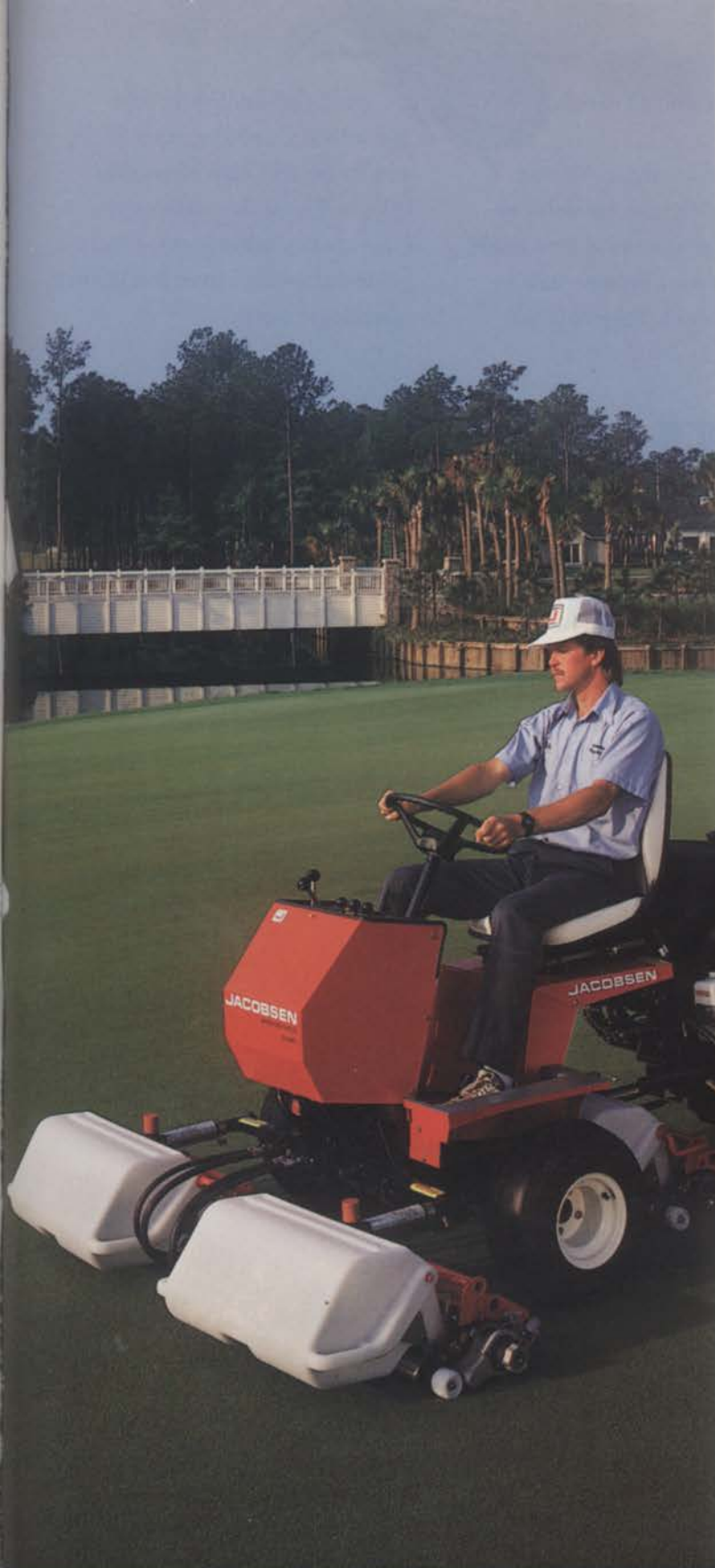
Observations of dollar spot resistance on golf courses to the sterol inhibitor (DMI) fungicides is becoming widespread, especially where DMI fungicides were used exclusively for control. Resistance is usually observed as a shortened control interval. Cyproconazole, fenarimol, propiconazole, and triadimefon—all in the DMI fungicide family—are not suitable alternatives to prevent or delay DMI resistance.

If you want to mix or alternate fungicides from different chemical families, consult specialists in your area. Some long-term studies at Penn State should mean improved recommendations on the use of reduced-rate mixtures of fungicides for improved efficacy and resistance management.

**Disease prediction models**—Where repeated fungicide applications are routine, such as on golf course greens, using disease prediction systems with computerized weather stations may minimize fungicide applications. Disease prediction models are available for anthracnose, brown patch, dollar spot and pythium blight.

A new brown patch prediction system from the University of Massachusetts uses air temperatures, soil temperatures, duration of high relative humidity and rainfall to predict brown patch outbreaks. Predictions are cancelled when air temperatures fall below 60° F within 48 hours of a prediction. Fungicide applications according to this forecasting system were reduced in university trials in Massachusetts, New Jersey, and Georgia compared to calendar spray schedules. A

*continued on page 61*



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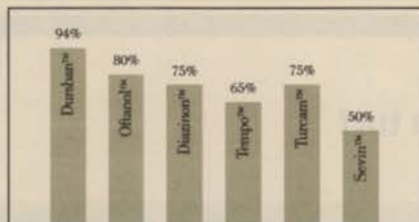
Here's an example. Mixing insecticide with insecticidal soap can reduce the amount of insecticide you need on your ornamentals by about 50 percent. Soap controls

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**Table 1.**

## Disease control for cool-season turf

Disease name	Cultural control	Chemical control
<b>Anthracnose</b>	Fertilize, aerate, raise mower height, less water on leaf blades.	chlorothalonil, cyproconazole, fenarimol, propiconazole, thiophanate-methyl, triadimefon
<b>Brown patch (rhizoctonia blight)</b>	Avoid excess nitrogen and water; minimize water on leaf blades.	captan, chloroneb, chlorothalonil, cyproconazole, fenarimol, flutolanil, iprodione, mancozeb, maneb, PCNB, propiconazole, thiophanate-methyl, thiram, triadimefon, vinclozolin
<b>Dollar spot</b>	Fertilize, aerate, minimize water on leaf blades; use resistant cultivars.	chlorothalonil, cyproconazole, fenarimol, iprodione, mancozeb, maneb, PCNB, propiconazole, thiophanate-methyl, thiram, triadimefon, vinclozolin
<b>Fairy ring</b>	Core and water; mask symptoms with N or iron; in severe cases, remove soil or fumigate.	flutolanil, (See specialist for information on fumigants)
<b>Fusarium leaf blight, crown and root rot</b>	Avoid drought, minimize water on leaf blades; reduce thatch.	fenarimol, iprodione, mancozeb, thiophanate-methyl, triadimefon
<b>Leaf spot melting out</b>	Avoid excess N and water, minimize water on leaf blades, raise mowing height; use resistant cultivars.	captan, chlorothalonil, iprodione, mancozeb, maneb, PCNB propiconazole, vinclozolin
<b>Necrotic ring spot</b>	Avoid water and fertility stress, aerate. Reduce thatch; use resistant cultivars.	fenarimol, cyproconazole, iprodione, thiophanate-methyl
<b>Powdery mildew</b>	Improve air flow, reduce shade; avoid excess nitrogen.	fenarimol, cyproconazole, mancozeb, propiconazole, triadimefon
<b>Pythium blight</b>	Avoid excess N; improve drainage. Don't water at night or mow in wet weather.	chloroneb, ethazol, fosetyl-AI, mancozeb, metalaxyl, propamocarb
<b>Pythium root rot</b>	Improve drainage, areate, raise mowing height.	ethazol, propamocarb
<b>Red thread/pink patch</b>	Fertilize, avoid low pH, minimize water on leaf blades. Use resistant cultivars.	chlorothalonil, cyproconazole, fenarimol, flutolanil, iprodione, mancozeb, propiconazole, thiophanate-methyl, triadimefon, vinclozolin
<b>Rust</b>	Fertilize, aerate, avoid water stress and minimize water on leaf blades. Use resistant cultivars.	chlorothalonil, cyproconazole, flutolanil, mancozeb, maneb, PCNB propiconazole, triadimefon
<b>Slime molds</b>	Minimize water on leaf blades. Hose or rake away mold.	no fungicide necessary
<b>Snow molds</b>		
<b>Typhula blight (gray snow mold)</b>	Let turf go dormant; mow until growth stops; minimize length of snow cover.	chloroneb, chlorothalonil, cyproconazole, fenarimol, flutolanil, iprodione, PCNB, propiconazole, thiram, triadimefon, vinclozolin
<b>Fusarium patch</b>	Same as Typhula blight control.	chlorothalonil, cyproconazole, fenarimol, iprodione, PCNB, propiconazole, thiophanate-methyl thiram, triadimefon, vinclozolin
<b>Stripe smut</b>	Buy smut-free seed. Avoid excess N in spring; avoid water stress in summer. Use resistant cultivars.	cyproconazole, fenarimol, flutolanil, propiconazole, thiophanate-methyl, triadimefon
<b>Summer patch</b>	See necrotic ring spot. Raise mower height, lower pH with ammonium.	cyproconazole, fenarimol, propiconazole, thiophanate-methyl, triadimefon
<b>Take-all patch</b>	Improve drainage, lower pH with ammonium fertilizers; raise mower height; avoid P and K deficiency. Avoid using lime.	fenarimol
<b>Yellow patch</b>	Minimize water on leaf blades; avoid excess N. Reduce thatch.	flutolanil
<b>Yellow tuft</b>	Avoid excess N; minimize water on leaf blades; improve drainage. Mask symptoms with iron.	metalaxyl

NOTES: List reflects current pesticide labels. Check with your local specialists for specific recommendations. No product endorsement is implied, nor is discrimination intended against any materials. Every effort has been made to provide correct, complete and current information. Nevertheless, changes in pesticide regulations occur constantly, and human errors are possible. State restrictions also vary. These recommendations are not a substitute for pesticide labelling. Read and follow label instructions.

Source: Dr. Schumann



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"I like the concentrated formulation. It makes container disposal a lot easier."

-Roger Taylor  
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"Touché provides really good results with broad spectrum control at an attractive price. What more could you ask of a fungicide?"

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Since its introduction in 1991, LESCO's Touché Flowable Fungicide has become the product of choice for turf professionals.

Lawn care operators, golf course superintendents and university researchers have proven Touché's effectiveness against major turf diseases. Touché offers preventive and curative control of leaf spot, brown patch, dollar spot, red thread and both pink and gray snow mold. Touché offers extended residual control — up to 28 days from a single application.

Touché is available in gallon and pint size containers. Its concentrated flowable formulation simplifies mixing and measuring, reduces container handling, and makes storage and disposal easier.

For more information on Touché, contact your LESCO Sales Representative, stop in at one of LESCO's 90 Service Centers, or call (800) 321-5325 (In Cleveland, 333-9250).

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Table 2.

## Scientific and trade names of turfgrass fungicides

Scientific name	Contact/Systemic	Common trade name
captan	C	Captain 80WP
chloroneb	C	Pro-Turf Fungicide V, Teremec SP, Terraneb SP
chloroneb + thiophanate methyl	C+S	Pro-Turf Fungicide IX
chlorothalonil	C	Echo, Daconil 2787, Thal-o-nil
cyproconazole	S	Sentinel
ethazol	C	Koban, Terrazole
fenarimol	S	Rubigan
fenarimol + chlorothalonil	S+C	Twosome
flutolanil	S	Prostar
fosetyl-al	S	Aliette
iprodione	S+C	Chipco 26019 Chipco Flo, Proturf Fungicide X
mancozeb	C	Dithane, Fore Fore Flo, Mancozeb
maneb	C	Maneb, Maneb Plus Zinc
metalaxyl	S	ProTurf Pythium Control, Subdue
metalaxyl + mancozeb	S+C	Pace
PCNB	C	PCNB, ProTurf FF II, Penstar, Terraclor
propamocarb	S	Banol
propiconazole	S	Banner
thiophanate-methyl	S	Cleary's 3336, Fungo, ProTurf Systemic Fungicide SysTec 1998
thiophanate-methyl+ chlorothalonil	S+C	ConSyst
thiophanate-methyl + mancozeb	S+C	Duosan
thiram	C	Spotrete, Thiram
triadimefon	S	Bayleton, Lebanon Turf Fungicide, ProTurf Fungicide
triadimefon + metalaxyl	S	ProTurf Fungicide VII
triadimefon + thiram	S+C	ProTurf Fluid Fungicide II
vinclozolin	S	ProTurf Fluid Fungicide III, Curalan, Touche, Vorlan

Not all products are available in all states. Some products available only to licensed pesticide applicators. This list is presented for information only. No endorsement is intended for products listed, nor criticism meant for products not mentioned.

Source: Dr. Schumann

## Disease control in warm-season grasses

**Turfgrass disease is caused by fungi, bacteria, viruses or nematodes.**

**Balance chemical applications with cultural controls, in the interest of efficiency and economy.**

by Bruce Martin, Ph. D.,  
Clemson University

■ The wide variety of warm-season turfgrass diseases makes it imperative that chemical applications be based on correct diagnosis, in the interest of efficiency and economy.

Turf managers should strive to use integrated systems of disease management compatible with good turf horticultural practices. Pesticide applications should only be used to supplement the overall integrated pest management system.

**Brown patch**—Caused by *Rhizoctonia* fungi, brown patch is most commonly caused by *R. solani*, although other species have been implicated. Overall, brown

patch is the most common and damaging warm-season turf disease. It attacks bermuda, St. Augustinegrass, centipede-grass and zoysia.

Its symptoms appear in spring, as the turfgrass breaks out of dormancy, or in the fall, as the turfgrass nears dormancy.

Individual patches of diseased turf may develop to 20 or more feet in diameter. Shoots along the outer border of patches usually are yellow due to rotted leaf sheaths near the soil surface.

Control practices include good drainage and judicious irrigation practices. Avoid high nitrogen fertilization at those times when the disease is likely to appear. Several labeled fungicides provide good control when applied on a preventive fall schedule when symptoms first appear.

The new fungicide, Prostar, has shown

## Disease control products for warm-season grasses

DISEASE	FUNGICIDE	Oz./1000	Interval (Days)
<b>BROWN PATCH</b> (warm-season turf)	Daconil 2787F	3-11	7-14
	Daconil 90WDG	1.75-6.5	7-10
	Prostar 50WP	2-3	14-21
	Bayleton 25WP	1-2	15-30
	Banner 14.3 EC	2-4	10-21
	Rubigan AS	1.5	7-14
	Chipco 26019 50WP	1.5-2	14-21
	Chipco 23.3%F	3-4	14-21
	Fore 37%F	6.4	7
	Fore 80WP	4	7
	Terraclor 75WP	16	21-30
	Terraclor 10G	7.5 lb.	21-30
	Curalan DF	1-2	14-28
	Clearys 3336 50WP	2	7-10
<b>DOLLAR SPOT</b>	Daconil 2787F	3-11	7-14
	Daconil 90WDG	1.75-6.5	7-14
	Banner 14.3EC	0.5 to 2	7-28
	Bayleton 25WP	1-2	30
	Curalan 50 WP	1-2	21-28
	Curalan DF	1-2	21-28
	Rubigan AS	0.75-1.5	14-21
	Chipco 26019 50WP	1.5-2	14-21
	Chipco 26019 23.3% F	3-4	14-21
	Fore 80WP	6-8	7-14
	Clearys 3336 50WP	1	14-28
	Vorlan DF	1-2	14-28
	Vorlan Flo	1-2	14-28
	<b>SPRING DEAD SPOT</b>	Rubigan AS	4-6
<b>GRAY LEAF SPOT</b>	Daconil 22787F	3-11	7-10
	Daconil 90WDG	1.75-6.5	7-10
	Banner 14.3%EC	2	14
<b>LEAF SPOT</b>	Daconil 2787F	3-11	7-10
	Daconil 90WG	1.75-6.5	7-10
	Chipco 26019 50WP	1.5-2	14-21
	Chipco 23.3%F	2-4	14-21
	Banner 14.3%EC	1-2	14-28
	Curalan 50WP	1-2	14-28
	Curalan Flo	1-2	14-28
	Vorlan DF	1-2	14-28
	Vorlan Flo	1-2	14-28
	Fore 37%F	6.4	7-14
Fore 80WP	4	7-14	
<b>PYTHIUM DISEASES</b>	Aliette 80WP	4-8	14-21
	Koban 30WP	2-4.5	5-10
	Subdue 2e	1-2	10-21
	Subdue 2G	12.5-25	10-14
	Banol 6E	1.3-4	7-21
<b>FAIRY RINGS</b>	Prostar 50WP	6	30
<b>NEMATODES</b>	Mocap 10G	4.6 lb.	6 months
	Nemacur 10G	2.3 lb.	6 months
	Nemacur 3E	9.7 fl. oz.	6 months

NOTE: Oz./1000 = ounces applied per 1000 sq. ft.

Source: Dr. Martin

promise for brown patch control.

**Dollar spot**—Dollar spot occurs on bermudagrass, zoysiagrass and occasionally centipedegrass and St. Augustinegrass. Favored by warm, humid weather, it is more severe on nitrogen-deficient turf

with dry soil.

On closely mowed turf, patches of about one to two inches in diameter develop. On higher cut turf, patches may exceed five or more inches in diameter.

*continued on page 40*

# Insect control, South

**Using a variety of techniques is best for consistent control of insect pests in the southern U.S.**

by Pat Cobb, Ph.D.,  
Auburn University

■ The big three—grubs, mole crickets and fire ants—continue to pose the most problems for landscape managers in warm-season areas, particularly in the Southeast.

Your own most important turf insect pest depends on your location and the grasses you manage. Mole crickets are considered primary pests in Florida, south Georgia and Gulf states in the Southeast. Grubs and fire ants are of great importance in Texas; chinch bugs in Louisiana; grubs in California.

To cope with these insects and others, landscape managers are relying more on diversified control techniques. Besides the standard chemical controls, turf professionals continue to increase their efforts to culturally and biologically manage insect pests.

Insect pest management on turf in the South is a year-round job. Although actual control efforts can extend from March through November in some areas, most southern turf managers consider insect control to be a part of a total management scheme for growing grass.

Each year brings with it a unique set of conditions that contribute to the development of turf pest problems.

**Seasonal influence**—Spring rains or drought can greatly influence pest populations.

Insect eggs, such as those of soil pests, need some moisture to survive. Excess moisture, (saturated soil), however, over a period of several weeks can drown grub and mole cricket eggs and prevent hatching.

The blizzard of March 13, 1993,  
*continued on page 61*

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# Insecticides for warm-season turf

INSECT PEST	INSECTICIDES*	TIMING	APPLICATION
<b>Mole crickets</b>	**Crusade 5G; Mainstay Mocap 10G; Oftanol 2 or 5G Orthene TT & O Pageant DF; **Triumph 4E Turcam 2.5G; Dursban bait	Map spring tunneling activity for treatment when nymphs hatch. <i>Do not use Oftanol more than two consecutive years in the same areas</i> ; apply Oftanol no later than when hatching begins. Crusade/Mainstay, Mocap and Turcam should be applied 4-6 weeks after first hatch. Apply Pageant two weeks after first observed hatch; Orthene or Dursban bait, 6-8 weeks after first hatch.	Irrigate the day before treatment or as lab recommends if dry conditions exist. Follow label for post-treatment irrigation directions. Treat late in the day.
<b>Sod webworms</b>	B.t. products **Crusade 5G or Mainstay **Diazinon Dursban Turf Insecticide or Pageant DF Prolox or Dylox Orthene TT&O **Tempo 2 **Triumph4E	Tropical sod webworm is the major species in Florida, and has spread in some seasons along the Gulf Coast into south Texas. In Florida, populations usually do not build up until June in the south, July in central and August in northern Florida and mid-coastal areas.	Delay mowing or irrigation for 24 hours after treatment or as label specifies.
<b>Two-lined spittlebugs</b>	**Diazinon Orthene TT&O Pageant DF	Treat when nymphs are present in spittle masses in the turf. Infestations usually begin in shady areas.	Water before treatment. Dethatching when recommended may improve control and disrupt spittlebug habitats. Treat late in the day.
<b>Chinch bugs</b>	**Crusade 5G or Mainstay **Diazinon Dursban Turf Insecticide Oftanol Orthene TT&O Pageant DF Scimitar **Tempo 2 **Triumph 4E	Replace turf with resistant or non-susceptible variety. More a problem in dry weather. Monitor St. Augustinegrass weekly, concentrate on sunny areas. Spot treat infested areas if possible.	Granules may be effective in heavily thatched turf.
<b>Grubs</b>	**Crusade 5G or Mainstay **Diazinon Dylox or Prolox **Mocap 10G Oftanol **Merit **Triumph 4E Turcam 2.5G	Summer treatments are best; most pest species have hatched by early to mid-August. Grub treatments may be effective through early fall, depending on location, species and soil moisture conditions. Map areas suspected to be infested and spot-treat to reduce treated areas. <i>Do not use Oftanol more than two consecutive years in same site.</i>	Irrigate the day before treatment to move grubs up in the soil. Follow label watering instructions.
<b>Billbugs</b> adults	**Diazinon Dursban or Pageant Dylox or Prolox Sevin **Triumph 4E	Treat when adults are numerous in early summer.	Follow label watering instructions carefully.
larvae	Exhibit **Merit **Triumph 4E	Treat in late March-April or July-August when larvae are present.	
<b>Ground pearls</b>	none	Follow recommended fertilization, irrigation, mowing, disease and nematode practices. Grass will in many cases "outgrow" damage.	n/a
<b>Imported fire ants</b>	<i>baits:</i> Affirm, Ascend, Amdro, Award or Logic <i>contact mound treatments:</i> **Diazinon; Dursban; Orthene fire ant products.	Apply baits in afternoons when worker ants are seen foraging.  Do not disturb mounds before treatment.	For high traffic areas, apply bait broadcast. If Affirm or Award is used, treat visible mounds with a contact insecticide 2-3 days later.

\*Some recommended insecticides

\*\*Label restriction: **Mocap 10G** is labelled for commercial turf (golf courses, sod farms) only. **Diazinon** is not labelled for use on golf courses or sod farms. **Triumph 4E** is restricted to certain soil types and several application techniques must be followed. It is labelled for use on lawns, sod farms and golf courses (only tees, greens and aprons). A maximum of one application per year is permitted to the higher surface insect rate and a maximum of two applications per year at least 60 days apart for the lower surface insect rate. **Tempo** is for home lawns only. **Merit** is not for sod farm use. **Crusade** is for golf courses and sod farm use. Check all labels to confirm site usage.

Source: Dr. Pat Cobb

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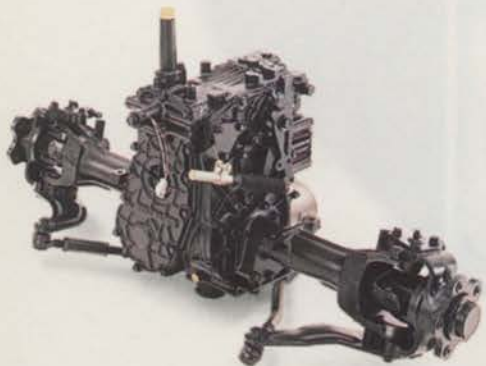
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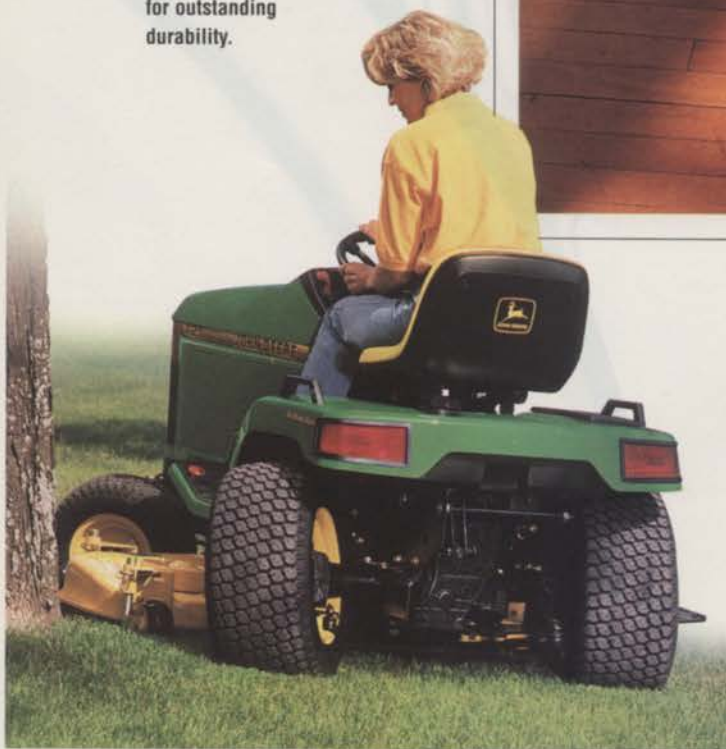
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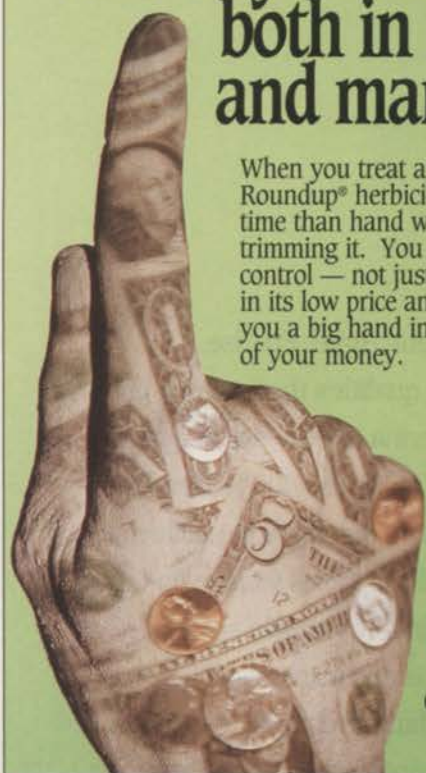
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## DISEASE WARM from page 26

Characteristic leaf lesions are tan with distinct reddish-brown or purplish margins. Leaves may become girdled.

Practices that reduce disease severity include using balanced fertility, early morning irrigation (when needed) during periods of high humidity, and regular mowing at the correct height of cut. Several fungicides provide good control, but are generally unnecessary in lawns.

**Spring dead spot**—Spring dead spot occurs in transition zone areas of the United States. It is common in Piedmont and mountain areas in the Carolinas and Georgia, but rare in the coastal regions of these states. Several fungi have recently been implicated as possible causal agents of this disease.

Dead circular areas of turf two or three feet in diameter are present in the spring as the bermudagrass breaks dormancy. Patches may occur in circles with healthy grass in the center, giving a "doughnut" appearance, and may persist over the summertime. Patches of diseased turf may persist for several years.

Generally, the disease develops in three- to six-year-old turf. Excess thatch, late summer nitrogen applications, and low temperatures in winter have been implicated as predisposing factors for spring dead spot development.

Maintain a balanced fertilization program and proper thatch management and avoid high rates of late summer nitrogen applications. Some control has been obtained with Rubigan applications made in September and October.

**Gray leaf spot**—Gray leaf spot appears in hot, humid weather. It's more severe in newly-established turf, in shady spots with poor air flow. It is commonly found in St. Augustinegrass.

Infections occur on all above-ground plant parts and begin as small brown spots with a distinct brown to purple border surrounding the infected tissue. Lesions may become numerous and expand to completely consume leaves and girdle stolons. Prolonged disease may leave turf looking scorched.

Improve air movement and light penetration and irrigate as needed during early morning hours to promote maximum drying during the day. Avoid high nitrogen fertilization during those periods favorable for disease development.

Daconil has given good chemical control.

**Leaf spot**—*Bipolaris sorokiniana* causes leaf, crown and root disease of bermudagrass and zoysiagrass during warm, wet weather in mid-summer. The diseases start as leaf spots, and may progress to crown and root rots. *Exserohilum rostrata* has been reported to cause a leaf spot of St. Augustinegrass and bermudagrass. Centipedegrass infection is rare.

On bermudagrass or zoysiagrass, small brown lesions appear on leaf blades and sheaths and may expand to larger irregular straw-colored lesions. Gradual browning and thinning occurs over a period of weeks or months.

Avoid high nitrogen fertilization and watering practices that provide long periods of wet or humid conditions.

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Frequent mowing at proper heights helps reduce the leaf spot phases of this disease.

**Pythium diseases**—Warm-season grasses may be affected by pythium disease. Some *Pythium* species cause general decline by infection of roots. St. Augustinegrass is susceptible during prolonged warm, wet periods. Poor surface and subsurface drainage favors development of *Pythium* fungi, and encourages development of algae in areas where disease has weakened the grass.

Provide good drainage and remove tree limbs to increase air movement and light penetration. Some fungicides specifically for *Pythium* fungi have provided additional control.

**Fairy rings**—These appear as rings or arcs of green stimulated turf which may be accompanied by declining grass and mushroom formation. Problems develop when mushroom mycelia accumulate in the soil and cause the soil to become dry.

Fairy rings may persist and increase in diameter over the years. The fungi feed on old roots, stumps or thatch. Newly-built putting greens may develop infestation after only a few years or even months.

Control measures that have shown limited success include tilling and fumigation or irrigation to saturate the soil for several hours and over several days. It may be futile to attempt to control rings occurring around trees. In this case, consider landscaping the areas with non-turfgrass plants.

There has recently been some success with suppression

in putting greens using Prostar fungicide.

**Nematodes**—Turf that is heavily infested with damaging nematode species appears unthrifty; weeds invade weak or dead areas. Infested areas tend to wilt prematurely, even when adequate soil moisture is available.

Integrated management uses several methods to suppress the nematodes and maintain the turfgrass so that it can withstand some level of infestation. Although valuable, nematicides provide temporary suppression of nematode levels.

Two nematicides are available and may only be used in commercial turf areas, such as sod farms or golf courses.

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# GOLF 'SCAPING

## Controlling aquatic weeds

■ Aquatic plants are a component of the aquatic environment that are natural, therefore they are necessary, says Robert Hesser a retired member of the Pennsylvania Fish and Boat Commission.

"Control"—not "eradicate"—is the magic word," Hesser says.

Ponds, most typically those on golf course landscape, serve three functions, according to Hesser:

- 1) They beautify the course.
- 2) They act as water hazards.
- 3) They can be an irrigation source.

**The weeds**—Aquatic weeds take two forms, Hesser notes: algae and flowering plants.

According to a Penn State University bulletin which Hesser co-wrote, algae is the most common and widely distributed of all aquatic plants. Three different types of algae—plankton, filamentous algae and muskgrasses—are found in the aquatic environment.

Plankton algae (phytoplankton) are single-celled plants that

gather at the top of the pond and frequently look like spilled dark green paint. "They are a pain in the neck," Hesser says.

Filamentous plants are often erroneously described as moss or slime. They tend to look like long strands of hair which can form dense mats or fur-like coatings on rocks and other underwater objects. "They have a way of hiding," he notes, "particularly on hot days when they drop to the bottom of the pond."

Muskgrasses, which resemble some flowering plants, are often rough and gritty to the touch. "They have a skunk-like odor and are very difficult to control," Hesser says.

Flowering plants take the form of sub-emergents (underwater), emergents (above water) and floaters (on the water surface).

"Sub-emergents include milfoil, allodea, hydrilla in the South, bladderwort, coontail and water celery, which is a beneficial plant in most cases," Hesser says.

Emergent plants include arrowhead, cattails, various rushes

*continued on page 44*

## Cleaning up Champion's lakes

■ The lakes at Champion Lakes Golf Club in Ligonier, Pa., needed cleaning. So veteran golf course superintendent Wade Coffman, stretched to the limits of his budget, tried a variety of solutions.

Mechanical raking, aeration and chemical weed control all seemed to work.

"(Aquatic weed control) is one of those things you let slip until someone says something," notes Coffman. "It got to the point, though, when the odor got just terrible in the warm, humid weather."

Champion Lakes—co-owned by former Pittsburgh Pirate baseball stars Dick Groat and Jerry Lynch—has seven bodies of water. Six smaller ponds drain into one bigger lake, which is used as the irrigation system's water supply.

"We put a fountain on No. 13," says Coffman. "There's always been a lot of algae in that pond, and it looked bad all the time. The fountain has definitely helped. We're going to put additional fountains on No. 11—and possibly No. 18, if this is a good year."

Part of the expense involved in



**Wade Coffman has tried a variety of solutions for weeds on Champion Lakes Golf Course's seven ponds and lake. Aerating fountains most recently have proven effective.**

installing pond aerators is getting electrical power to the ponds which, Coffman observes, "costs a good bit."

Drawdowns and mechanical raking have always been his first option.

"Usually, we draw the pond down a little and rake out what we can," he says. "There are also a lot of new chemicals out that seem to work well. But since we're using the water for irrigation, we have to kind of watch what we're putting in it."

Sonar (manufactured by SePro), Reward (manufactured by Zeneca), Komeen (manufactured by Griffin) and

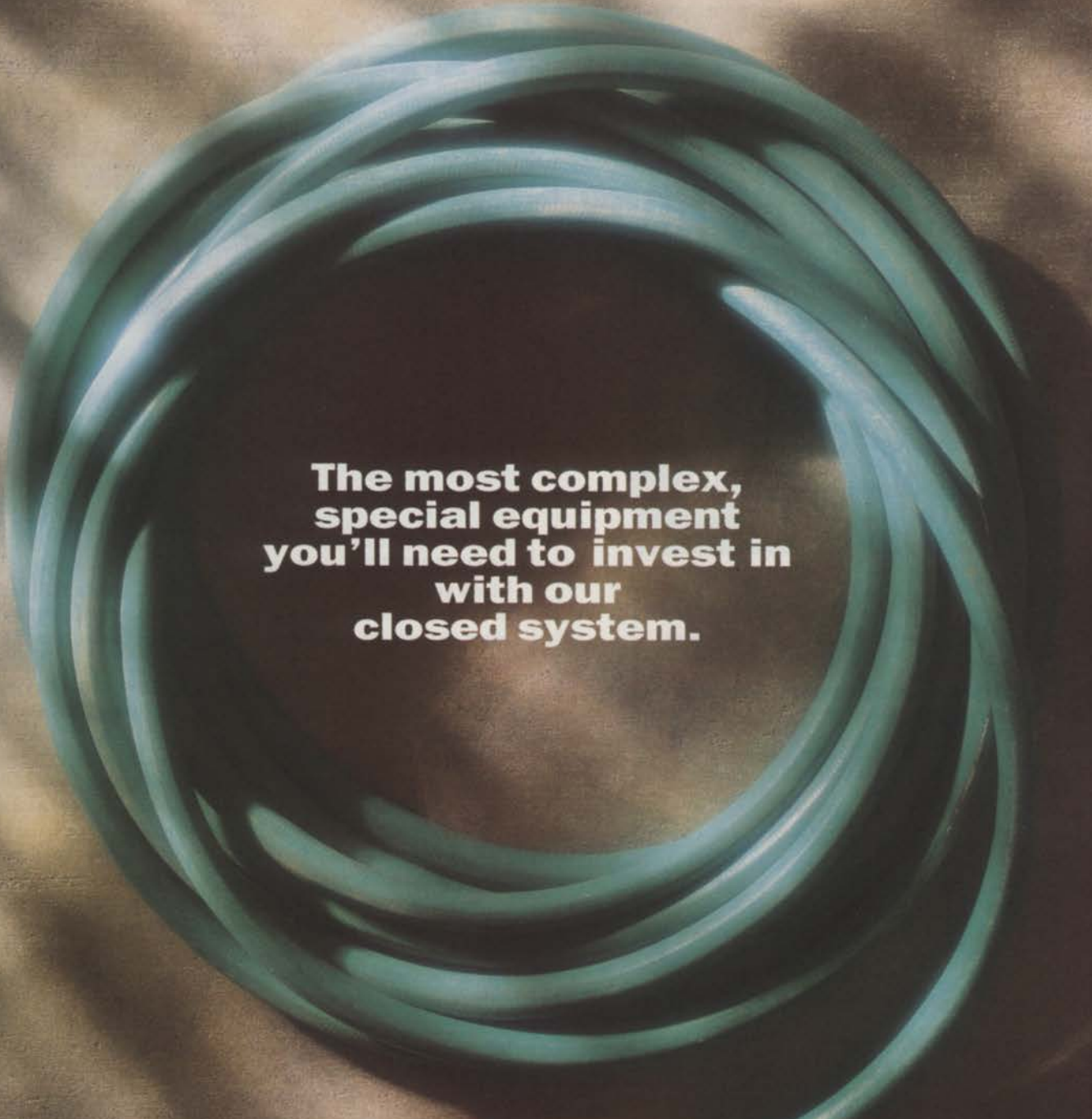
Rodeo (manufactured by Monsanto) are some of the improved aquatic herbicides available. Coffman has been especially happy with the performance of Komeen.

"I'm still trying to learn the names of the weeds," Coffman notes. "You've got to tell the Pa. Department of Natural Resources exactly which weeds you want to treat before they'll give you a permit."

The 18-hole course sits in the midst of the Laurel

Highlands, just a stone's throw from Latrobe, Pa., where Arnie Palmer grew up. Palmer has played Champion Lakes, which is also a favorite of numerous professional baseball and football players, Coffman says.

Most of Champion Lakes' business comes from Pittsburgh-area golfers, who are drawn to the rolling hills, bentgrass fairways and sparkling lakes. "Dick and Jerry wanted a championship course that would be playable for anybody," notes Coffman, who's been the superintendent since the course opened in 1966. —J.R.



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Milfoil  
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whorls of  
feather-like  
leaves.

## AQUATIC WEEDS from page 42

which grow along the edges of a water body. "These tend to be not too much of a problem except for cattails, which come from ponds that are too shallow (less than four feet deep) around the edges," says Hesser.

Floaters—most of which are rooted plants with much of their structure floating on the surface—include water lilies, spatterdock, watershield and duckweed.

**Control**—The best way to control aquatic plants is to prevent excess nutrients from entering the water, the Penn State leaflet says. Control, Hesser further notes, can be achieved either environmentally, mechanically and/or chemically.

Environmental control consists of deepening shorelines, holding water at certain levels, and drawdowns. Fertilization is also an environmental control—one which, Hesser says with some hesitation, will stimulate plant growth for predators.

"I'm not a proponent of fertilization," he continues. "This method of control was developed down south where the longer growing season is prevalent."

Mechanical control consists of cutting, mowing, raking and hand-weeding, all very labor-intensive and sometimes very difficult to achieve. Also included in this type of control are mechanical surface aerators or fountains and compressed air systems.

"The advantages of water aeration include higher dissolved oxygen levels, cooler temperatures through mixing of top and bottom water layers, less aquatic vegetation, and a more aesthetically pleasing water body condition," the Penn State leaflet says.

Biological control of aquatic plants is a controversial method, Penn State says. "And the only fish I'm aware of that will eat some vegetation is the grass carp," Hesser adds. (Triploid grass carp, a genetically altered version, are not legal in all states. They are also very expensive.)

Specialty herbicides, if used, need to be applied precisely according to the EPA label. In some states, such as Pennsylvania, you need permission from the governing state aquatic or agricultural commission before applying chemicals.

Finally, says the Penn State Cooperative Extension Service, "a good understanding of the water's chemical and physical characteristics (pH, hardness, temperature) is highly desirable."

Normal rates of some chemicals like copper sulfate are not as effective in water temperatures of less than 60°F or in water having hardness above 50 parts per million or three grains.

—Jerry Roche

**Tricks of the trade:**

# Pin rotation reduces foot traffic stress

■ "Unbelievably difficult, but fair," was how Ray Floyd described pin placements at this year's Masters Tournament.

In addition to offering a challenge to the golfer, pin placement must also be done in a way that spreads the traffic around during the week.

Moving the cup from day to day routes traffic around the green for minimal turf stress. When done in conjunction with tee placement, pin placement serves as a distance guide for players.

"The whole point of pin placement is that you don't come back to the same spot on the green too soon," says Bob Breen of the USGA Greens Section, who supplied us with the chart shown below.

Unfair pin settings penalize golfers and distort handicaps.

The 18 holes of a golf course should have six difficult—but fair—placements, six placements of medium difficulty and six relatively difficult placements.

No matter which plan you follow, it's likely to be thwarted some time during the season, thanks to wet weather or a dry spell. Modify as needed.

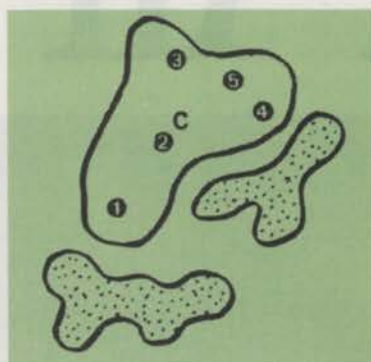
Lee Redman of Sunset Country Club, St. Louis, provided us with these two guides to pin placement.

For the guide at the right, players are instructed as follows:

1. Each day, the flag is placed in one of five zones.

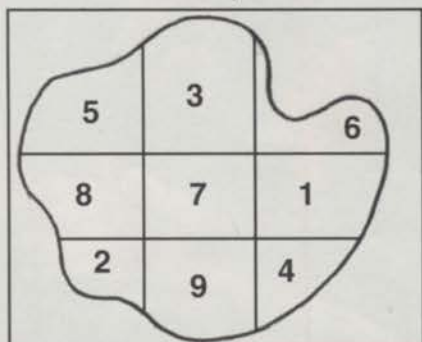
2. Check stimpmeter and flag location sign at the first tee box to know what zone is being used for that day's play.

3. All yardage measured to the center of the green (C).



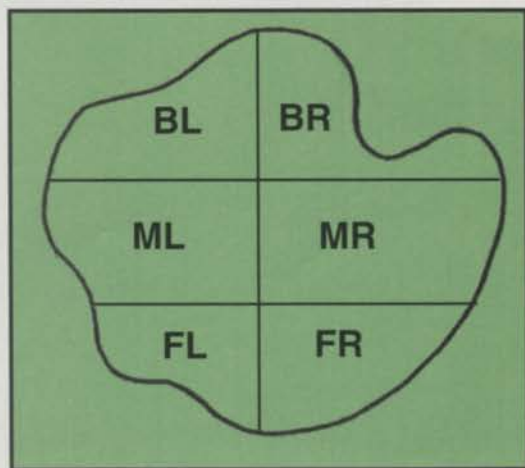
In the system shown below, the green is divided into nine quadrants. Tee markers are positioned in front, rear or center of tees.

Quadrant	Tee marker
1	Center
2	Rear
3	Front
4	Rear
5	Front
6	Front
7	Center
8	Center
9	Rear



## USGA suggestion for cup location and rotation schedule\*

Hole	Day					
	1	2	3	4	5	6
1	FL	BR	ML	FR	BL	MR
2	BR	ML	FR	BL	MR	FL
3	ML	FR	BL	MR	FL	BR
4	FR	BL	MR	FL	BR	ML
5	BL	MR	FL	BR	ML	FR
6	MR	FL	BR	ML	FR	BL
7	FL	BR	ML	FR	BL	MR
8	BR	ML	FR	BL	MR	FL
9	ML	FR	BL	MR	FL	BR
10	FR	BL	MR	FL	BR	ML
11	BL	MR	FL	BR	ML	FR
12	MR	FL	BR	ML	FR	BL
13	FL	BR	ML	FR	BL	MR
14	BR	ML	FR	BL	MR	FL
15	ML	FR	BL	MR	FL	BR
16	FR	BL	MR	FL	BR	ML
17	BL	MR	FL	BR	ML	FR
18	MR	FL	BR	ML	FR	BL



FL=Front left  
FR=Front right  
ML=Middle left  
MR=Middle right  
BL=Back left  
BR=Back right

\*For a course that is closed one day a week. If your course is open on the seventh day, start back at #1.

Courtesy USGA Greens Section

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## Audubon names Collier's Reserve its first 'Signature'

■ Collier's Reserve in Naples, Fla., is the first-ever Audubon Cooperative Sanctuary Signature Golf Course.

Collier's was designed by Arthur Hills and constructed according to Audubon's rigorous planning standards and strict environmental disciplines.

Eco-friendly objectives were achieved in five areas: water conservation, wildlife conservation, habitat enhancement, energy efficiency and waste management. For instance:

● The irrigation system was completely re-designed to become a "prescription irrigation" system, adding \$130,000 to its cost. Each sprinkler head is individually chosen and placed, so that neither native vegetation nor lake/river areas would receive unneeded watering, and so the differing needs of the turf types would be met.

● Several hundred thousand native plants not required by permit were installed. More than 80 percent of the course's vegetation is native.

Tim Hiers, a nationally-recognized expert on Integrated Pest Management and a member of the **LANDSCAPE MANAGEMENT** editorial advisory board, was hired as golf course superintendent. He was formerly with John's Island Club in Vero Beach.

Initially, the Audubon and Collier's had developed a Naturalization Plan that included objectives, an analysis of existing conditions, a conceptual design plan, and an establishment and maintenance program. Site inspections continued throughout construction.

Collier's Reserve must keep up its standards because Audubon representatives will check it regularly to assure that it continues to qualify for the designation.

Six other golf course projects under construction are now seeking similar recognition. Also, the American Society of Golf Course Architects has announced its intention to use the guidelines for all future courses.



**Hiers: Selected for his knowledge of Integrated Pest Management.**



Once you've determined what areas on your golf course are defined as wetlands, you can take appropriate action, says Nancy Sadlon of the USGA.

## USGA official says: know your wetlands

■ You might refer to that often-damp, low-lying patch of ground on your golf course as a swamp, but, more correctly, it's a wetlands. Treat it with respect.

Nancy Sadlon of the U.S. Golf Association, Far Hills, N.J., describes wetlands as unique ecosystems that:

- 1) provide wildlife habitat;
- 2) filter and break down pollutants coming from runoff;
- 3) play a role in flood protection; and
- 4) offer recreational opportunities to people.

Golf course superintendents must be aware of them because of the growing body of regulations surrounding their preservation and management.

"Some wetlands are easy to recognize. Others aren't so easy to recognize," says Sadlon. Generally they must meet the three "Hs" to be referred to as wetlands:

**Hydrology**—These are areas that are inundated with water for a period of time each year.

**Hydric soils**—Wetlands characteristically have mucky soils.

**Hydrophytic plants**—These areas contain plants that like to have their "feet" wet.

To identify suspected wetlands on your course, examine aerial photographs of the property, review federal and state wetland inventory maps, and check with the soil conservation service to identify hydric

soils which are strong indications of a wetland. Unsure about the permitting process of altering a wetland? Consider hiring a wetland consultant, says Sadlon.

"Before we recognized the value of wetlands, some of these areas would have been filled in to accommodate a cart path or perhaps, even, a fairway," she adds. "We have certainly seen interest and recognition of the value of wetlands increase."

Sadlon says superintendents should protect their ponds and wetlands with silt fences and vegetative buffers to minimize runoff and pollution getting into these areas.

"Something every course can do, whether it's an old course or a new course, is to recognize the value of the plant materials around the edges of the wetlands. It acts as a buff, it enhances wildlife habitat and it adds aesthetics to the golf course," she explains.

The lead agency for wetlands is the U.S. Environmental Protection Agency, but the U.S. Army Corps of Engineers regulates the "404 Program" dealing specifically with their management. Sadlon says superintendents should also be aware that wetlands can be protected by local and/or state regulations too.

Sadlon made these comments before 200 turf managers at the Michigan Turfgrass Conference this past January.

—Ron Hall

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Circle No. 126 on Reader Inquiry Card

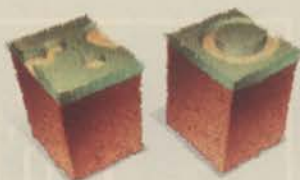


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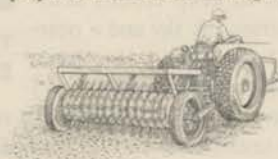
reliable signs), you can put down fungicide with perfect timing, and make fewer applications.

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and infrequently in the early morning (taking steps to keep your turf dry reduces the risk of dollar spot).



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# LAWN CARE INDUSTRY

## Path to lawn care knowledge often steep and exhausting

by Ron Hall, senior editor

■ The longer I follow the Lesco broadcast spreader, the more the mustard-colored granules look like tiny, hard-bodied insects trying to escape a predator. I push the spreader; they frantically jump away, pelting the papery, curled leaves in the grass like a dry rain, skittering over cast iron water meter covers and patches of bare clay where tenants had parked barbecue grills.

Turf fertilizer hopping like fat brown and yellow fleas?

I know I'm fatigued. My legs quit complaining two hours ago. They're leaden. But hallucinations?

Yesterday, we—owner Steve Bailey, college senior Ron Sandrock and myself—had planned to kick off Grassroot Lawn's season by treating one of its biggest accounts, an apartment complex with 480,000 sq. ft. of turfgrass, about half of it sliced into tiny grassy triangles, rectangles and other assorted shapes. That's what you get with a dozen apartment buildings

designed and built into a sloped ravine along a small stream.

It rained, so Steve spent the soggy afternoon instructing me on the science of pushing a spreader. Steve views correct application—judging by the intensity of his instruction—as something slightly less precise than laser surgery. Okay, I exaggerate a bit. Anyway, he apologizes for being so thorough. He'll be too busy to look over anybody's shoulder once we start, he explains.

Tuesday, March 22, just north of Columbus, Ohio, is a perfect day. There's breeze enough to keep clouds scuttling across the sky and a near-perfect 65°F, but I've been walking so persistently that I still have to reach around with my right arm to unstick the back of the blue cotton work shirt from my back. Perspiration slides down my back. Any exertion more



Two days of pushing a spreader reaffirmed Senior Editor Hall's decision to remain a journalist.

lively than the pace I've fallen into behind this spreader causes me to pant.

I'm just finishing my first-ever 9½-hour day as a lawn applicator. I admit to being both more exhausted and more self-satisfied than I should be. I'm also feeling a tinge of guilt. Just a tinge.

I'll only be a lawn applicator a couple of days. That thought, with increasing and undeniable relief, is always in my mind.

In a few days I'll return to the real world—the blinking computer screen, the telephone and steaming cup of tea. Dew never covers the carpet there. I never push a spreader or run a lawn care company in my 8- by 12-foot office with its shoulder-high petitions.

My partner Ron Sandrock slides a cheap pen from the pocket of his work shirt and scribbles some numbers on the side of the bag he's just hoisted onto the fender of the trailer. He probably doesn't weigh 150 lbs. I'm surprised every time he horses another 50-lb. bag of Scotts fertilizer out of the trailer. He does it so easily.

It seems like I've wrestled a lot more than the 40 bags we stacked onto the trail-

### You spread fertilizer, we spread information

■ I think back to when I got the idea of actually working as a lawn technician, then writing about it.

"But what could anyone learn about spreading fertilizer? I'm sure they already know all they need to know about it," said Steve Bailey to my offer. That's when I asked if I could help kick off his first round of lawn applications.

Bailey had a point. How could I shed new light on this subject to Bailey, charter member of the Ohio Lawn Care Association, graduate of nearby Ohio State University, owner/operator of Grassroots Lawn & Irrigation? What insight could I provide anyone calling himself a lawn care professional?

Not being able to come up with a convincing answer—either for Bailey or for myself—I asked, "But you could use some help, couldn't you?" He was honest enough to say he could.

But I do advise people like Bailey how to do these things more efficiently or more profitably. More accurately, I guess I don't advise them—who the deuces am I to advise them? Information: sure. Advice: no. I gather information from others in the business particularly good at one facet or another of lawn care, and pass it on. I sometimes go to unusual lengths—and my employer to unusual expense—to get this information. Then we publish it.

—R.H.



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**I'll only be a lawn applicator a couple of days. That thought, with increasing and undeniable relief, is always in my mind.**

er just after daybreak. Now we've got a truck bed full of empties.

Ron says we have just enough product to finish one remaining ridge. Maybe half a bag between our two spreaders, and two 50-lb. bags, one for him, one for me. At  $\frac{1}{2}$  lb. of N per 1,000 sq. ft., that should just about do it, says Sandrock.

He's a senior at Ohio State, studying turfgrass, and wants to be a golf course superintendent. That much he shares. But mostly he's quiet.

The grassy hill, with several apartment buildings lining its top, is maybe 70 yards long, 30 yards wide. Until I started tiring just before noon I didn't even notice it. As the day advances, and I treat the dozens of smaller triangles and rectangles of turfgrass surrounding it, it grows. Starting as a mere hillock, it keeps swelling as I push that spreader, and now it's finally high enough to be snow-capped, like Everest. In my mind it is. One thing for sure: it's too steep for the little tractor and spreader that Bailey had used on the long, flat turfgrass areas earlier in the day.

Since Sandrock, like myself, unaccountably saved this hill—the largest and steepest on the property—for last, I suspect he's hardly eager to tackle it either.

"You take the higher end of the ridge. It looks a little more level up there," he suggests, surmising that the needle on my gas tank is quivering on E, "and I'll start in this corner. We'll probably meet about halfway up the hill."

He's right. We do. Except for some clean-up and getting the spreaders back to the shop and put away, we're done.

Tomorrow we start with another commercial property, half as large and almost completely flat. Then there's a 50,000-sq. ft. property ("It's easy," grins Sandrock.), and then residences, most of them the 8,000-10,000 sq. ft. variety.

That's when I'll cut out, when we get to the home lawns. Ron can handle them more efficiently by himself.

Being a professional lawn applicator is definitely a job for a younger man with younger legs.



Grassroots Lawn Care & Irrigation started its application season on March 17. Applicators: (left to right) Hall, Ron Sandrock, owner Steve Bailey.

## 10 things I discovered as a lawn rookie

■ In the course of a long hard day, the professional turf applicator's life shrinks to just two dimensions: turfgrass (treat it) and not-turfgrass (don't treat it).

Richer, more weighty thoughts seem to be particularly hard to come by behind a lawn spreader or tugging at a spray hose. So you can imagine my difficulty in boiling down my short-lived experience as a lawn applicator to these few simple observations. (I probably could have come up with more, given another couple of days on the job.)

**10) Never** try to push a full spreader around the steepest part of a hill. A spreader with 80 lbs. of product handles like an over-loaded coal truck—except the truck has brakes.

**9) If the lady** of the house happens to be walking to her mailbox as you're approaching at right angles with your spreader full bore, throttle back, give her the right-of-way and politely smile and nod as she peruses the day's mail.

**8) Never,** ever spray dogs with product, no matter how much of a mess they've left in the grass. The same goes for kids—large or small, chained or unchained.

**7) Don't** try to pick up every little scrap of paper lying in your path on a big job like condos or apartments. But you're expected to move, if you can, picnic tables for a more uniform application. (What about old tires?)

**6) Wear a hat** no matter how much hair you have. Comfortable work boots, gloves and long sleeves are more than handy too, unless you enjoy sunburn, blisters and scratches.

**5) Pack** a broom on the truck. Blowers are great but, being mechanical, they can fail. In some situations they're too noisy.

**4) Go to the bathroom** just before you arrive at a big job site. Don't gamble on finding public facilities.

**3) Discriminate:** put turf fertilizer only where there's turf, or a reasonable expectation of turf—meaning you don't have to ram your spreader beneath most evergreens or trees with prickly spines (i. e. don't be too fine in fertilizing beneath Hawthorne trees).

**2) Don't** use your prized baseball hat to mark where you've left off while you retreat to refill your spreader, particularly not near sidewalks. "Uhhh, nice hat," the passing mailman says appraisingly as the applicator hustles back to the site.

**1) Make a map** of big properties or of properties with lots of little turfgrass areas. It doesn't have to be fancy, just reasonably accurate to show the location and size of the areas you're treating. When you finish a section, color it on the map. Also, a map will help you find your way back to the truck at day's end.

—R.H.





## IN NEW JERSEY'S "BROWN PATCH ALLEY... I'VE HAD GREAT SUCCESS WITH DAONIL 2787."



*Tim McAvoy,  
Superintendent,  
Fox Hollow Golf Club  
Somerville,  
New Jersey*

"This part of New Jersey might be called 'Brown Patch Alley,'" exclaims Tim McAvoy, certified golf course superintendent at Fox Hollow Golf Club in Somerville, N.J. "The terrain, the soil, and the grasses we grow seem to make us more susceptible." Fortunately, Tim has found that Daconil 2787® Flowable Fungicide from ISK Biosciences Corporation "has a great ability to stop Brown patch every time."

### **Stops Dollar spot, too!**

Fox Hollow's greens are bentgrass, Tim says, "and unfortunately, *Poa annua*." Recently renovated tees are 100% bentgrass, while the fairway grass is a combination of fescue, rye and *Poa*. That makes the fairways more susceptible, he believes, to Brown patch and Dollar spot.

"The fairways are where I use Daconil 2787 most," he says. "Starting in late June, I pretty much follow a 10- to 14-day preventive schedule for both diseases."

"We try to make good use of all the products and cultural practices available to us," Tim adds. "We use a slow-release urea-type fertilizer in the spring and then little or no nitrogen until

September. We watch the water so we're not exceptionally wet, and we dethatch and do some other things to keep the microclimate as cool as possible when the turf is under the most stress."

### **Tank mixing saves time.**

Besides great Brown patch and Dollar spot control, superintendents get still another important benefit from Daconil 2787: "The flowable formulation is compatible with so many other products," says Tim, "I can tank-mix and knock out two or three diseases. With so much acreage, tank mixing really helps me stay within my personnel budget."

And with Daconil 2787 as the cornerstone of Tim's disease-control program, he doesn't have to worry about disease resistance, either: "As far as Daconil 2787 is concerned, I don't think there's ever been a documented case of resistance. I've always had great success with Daconil 2787."

Have you got a Daconil 2787 success story? Tell us about it. If we use your story in an ad, we'll donate \$100 to your favorite charity. Write Jackie Tengler, ISK Biosciences Success Stories, 5885 Landerbrook Dr., Suite 215, Cleveland, OH 44124. Always follow label directions carefully when using turf and ornamentals plant protection products.

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# HOT TOPICS

## ALCA acquires technician certification program

**RESTON, Va.**—A national certification program for landscape technicians is in the works.

The Associated Landscape Contractors of America (ALCA) agreed to purchase the Certified Landscape Technician Program that was developed by the California Landscape Contractors Association (CLCA). This is the same program used the past several years in California and also by landscape associations in Colorado, Oregon and Washington.

"We will be forming a National Landscape Technician Council to review the tests and discuss and approve regional test differences," says ALCA Executive Director Debra Atkins. CLCA developed the test over an eight-year period. She said ALCA's Board of Governors decided that it is "an excellent program," and didn't see a reason to duplicate the efforts of the CLCA.



Sometime yet in 1994 each state will be given the opportunity to set dates and sites for offering the National Certified Landscape Technician Program, which deals primarily with exterior landscaping knowledge and skills.

A news release on CLCA letterhead signed by Henry Buder, CLT ("Certified Landscape Technician"), said that the CLCA in January 1993 offered to sell ALCA the program so that it could be administered nationally. ALCA studied the program—some members even personally visiting test sites—before finally offering \$40,000 to acquire the program last month.

The technician certification program will complement several other certification programs that ALCA administers, explains Atkins, including its Certified Landscape Professional (for owners and managers), which has been up and running since January 1993.

Eventually, said Atkins, ALCA hopes to administer certification programs covering most aspects of professional landscaping, both interior and exterior.

—Ron Hall

## Stihl recalling backpack blowers and sprayers with fuel line leak

**VIRGINIA BEACH, Va.**—Stihl, Inc. is recalling all BR 320, BR 400, SR 320 and SR 400 backpack blowers and sprayers manufactured after Oct. 21, 1991 with serial numbers above #224438666.

The serial number can be seen through a small opening above the recoil starter housing indicated with an embossed "No. ♣."

This recall is necessary, Stihl says, because of possible fuel line leaks "that could cause a fire under certain condi-

tions, resulting in the serious injury or death of users or bystanders."

The questionable units were sold from November 1991 to the present.

If you have purchased one of these units, Stihl recommends you discontinue its use immediately and return it to an

authorized Stihl dealer for replacement of the fuel line and modification of the fuel tank at no cost.

If you have any questions, contact your Stihl dealer (Yellow Pages under "Saws") or call (804) 486-8444.



Locating the serial number on Stihl's BR 320, BR 400, SR 320 & SR 400.

### ELSEWHERE

**P.A.T. rights are sold to Joe Motz, page 57**

**Profit takes the PLCAA spotlight, page 57**

**Books, literature for the industry, page 58**

## Motz acquires rights to P.A.T.

**CINCINNATI**—Local businessman Joseph E. Motz thinks advances in drainage technology will drive professional and collegiate sports back to natural grass fields.

Motz, owner and president of Motz, Inc., announced the purchase of Turfgrass Services, Inc., Pueblo, Colo., gaining rights to the athletic field design system known as Prescription Athletic Turf (P.A.T.).

P.A.T. is based on the use of vacuum to forcibly extract water from the sand-based field, keeping the surface mud free and playable even under extreme weather conditions. The action can be reversed to irrigate the field from the base up, allowing the turf to be watered even while it is under play, explained Motz. Subsurface electronic moisture sensors tied into the vacuum and irrigation systems allow P.A.T. to function automatically.

P.A.T. was invented at Purdue University about 20 years ago and has since been installed on 34 major playing fields, including: Soldier Field, Chicago; Joe Robbie Stadium, Miami; Camden Yards, Baltimore; Ohio Stadium, Columbus; and Seminole Stadium, Tallahassee, Fla.

Motz's Sports Turf Division manages two P.A.T. fields in Cincinnati as well as constructing athletic fields throughout the tri-state (Ohio, Kentucky, Indiana). It also provides technical management services to more than 35 university and high school fields in that area.

"There is nothing like P.A.T. anywhere in the world," says Motz. "The \$600,000-plus price tag puts P.A.T. within reach of only the sporting elite. Potential for the system is as strong overseas as it is in the United States."

### Lawn care panel predicts:

## Give customers more value

**KANSAS CITY**—"To make our products worth the price, we must give the customer added value," said Gary Ahrens of Interstate Distributing at the second annual Western Lawn Expo here.

Ahrens was on a "Future of the Lawn Care Industry" panel.

David Zerfoss of Husqvarna Forest & Garden agreed: "The dealer must do something different—like supplying a greater number of products, or promoting after-

market service or his intimate knowledge of the industry and its products."

John Cundiff of Turf's Up Lawn Service said this: "Things are getting tougher, as worker compensation, mandated health care and NAFTA continue to creep into our day-to-day operation."

Other panel members were John Smith of Exmark Manufacturing and Tom Glaub of the North American Equipment Dealers Association.

## GREEN INDUSTRY EVENTS

What's going on in the industry

### MAY

**14: Baseball/Softball Field Maintenance**, Boone, Iowa. Phone: Gary Peterson, (515) 791-0765.

**17: Scouting for Pests and Problems in the Landscape**, Sandwich, Mass. Phone: Kathleen Carroll, (413) 545-0895. (Repeated June 1 in Waltham, June 9 in Amherst.)

**18: North Carolina Turf & Landscape Research Field Day**, Raleigh. Phone: (919) 266-1777.

**18-20: Color Magic '94**, Walt Disney World, Orlando, Fla. Phone: Florida Nursery Growers Association, (407) 345-8137.

**24: Sports Turf Workshop**, Kane County Event Center, Geneva, Ill. Phone: (708) 439-4727.

### JUNE

**8: Lofts Ohio Field Day**, Wilmington, Ohio. Phone: David Goodwin, (513) 382-

1127 or (800) 382-1127.

**10: Lofts Maryland Field Day**, Beltsville, Md. Phone: John Patton, (301) 937-3332 or (800) 732-3332.

**13-18: Harvard University Graduate School of Design courses and workshops** in golf course design, site planning, development, Cambridge, Mass. Phone: (617) 495-1680.

**16: Turf-Seed Inc./Pure Seed Testing Inc. Field Day**, Hubbard, Ore. Phone: Tom Stanley, (503) 651-2130.

**22: Sports Turf Association (Canada) Annual Field Day**, Guelph Turf Institute, Canada. Phone: Jane Rivers, (905) 847-9181.

**23: University of Massachusetts Turf Research Field Day**, South Deerfield, Mass. Phone: Dr. Richard Cooper, (413) 545-2353.

**23: Biological Control of Insect and Mite Pests of Woody Landscape Plants**, Amherst, Mass. Phone: Kathleen Carroll, (413) 545-0895.

## PLCAA spotlights profit, professionalism; ALCA, PGMS join in for Green Industry Expo

**MARIETTA, Ga.**—"Profit Through Professionalism." That's the theme for the 1994 Professional Lawn Care Association of America (PLCAA) Conference Nov. 13-17 in St. Louis, Mo.

Joe Williams of Lawn Master, Inc., Pensacola, Fla. is a PLCAA board member. He describes the conference as "the one-stop education extravaganza and shopping event of the year."

The affair begins Sunday morning,

Nov. 13, with a seminar, hosted by the Professional Lawn Care Association of Mid-America, at the Missouri Botanical Gardens. An afternoon pre-conference seminar rounds out the day at the Adam's Mark Hotel. Separate registration is required for each of these events.

The Adam's Mark Hotel serves as the headquarters hotel for PLCAA. The conference educational programs and the trade show take place in the America's Center (formerly Cervantes Convention Center).

The Green Industry Expo/94 is sponsored by PLCAA, the Associated Landscape Contractors of America (ALCA) and the Professional Grounds Management Society (PGMS).

For more information on the PLCAA Conference or the Expo, contact: PLCAA, 1000 Johnson Ferry Road, NE, Suite C-135, Marietta, GA 30068; phone (800) 458-3466.

For more information on the conference being held by ALCA, phone (703) 620-6363. For more information on the conference being held by the PGMS, phone (410) 584-9754.

# INFO CENTER

## Selected books and videos for the industry

**GREENS MOWING MADE EASY...**The first program in a continuing golf course superintendent's video training series is called "Greens Mowing Tips and Orientation." The 30-minute video, which features superintendents Paul Latshaw and Darren Davis, has 15-minute segments on triplex mowing and walking greens mowers. Employee handbooks are included. Call (800) 938-4330 for a free preview tape.

**TREE CARE VIDEO...**The National Arborist Association is offering a "Ropes, Knots and Tree Climbing" video training tape. It covers the newest techniques for using carabiners, the prusik loop and false crotches, as well as basic instruction in knots and climbing techniques. The video is packaged with employee comprehension sheets and attendance sheets for proper OSHA documentation. For more information, write or call the N.A.A., P.O. Box 1094, Amherst, NJ 03031; (800) 733-2622.

**NEW DOT GUIDE...**To assist lawn care operators in complying with Department of Transportation regulations, the Professional Lawn Care Association of America has developed a "Guide to the Transportation of Pesticides." Price is \$25 for PLCAA members, \$40 for non-members. To order, send check (payable to PLCAA), Visa or MasterCard number and expiration date to: PLCAA, 1000 Johnson Ferry Rd. NE, Suite C-135, Marietta, GA 30068; or fax your order to (404) 578-6071.

**SHADE TREES...**Written by a team of researchers in the Auburn University Department of Horticulture, "Shade Trees for the Southeastern U.S." is designed for landscapers, students, nursery operators, urban foresters, and anyone who works with trees. The 133-page softcover book contains more than 200 color photos. It is available for \$10 per copy. For more infor-

mation, call Robyn Hearn at (205) 844-4877 or send check, money order or purchase order to Research Information, 110 Comer Hall, Auburn University, Auburn, AL 36849.

**PESTICIDES BY DISKETTE...**C&P Press's new computer program is titled "Electronic Pesticide Reference." It contains 30 chemical manufacturers, full text labels for more than 800 products, 1,000 full text MSDSs, product summaries and current DOT shipping information by product. The program is available on CD-ROM or Multiple Diskettes. Subscribers receive updates every 90 days. For more information, contact C&P Press at 888 Seventh Ave., Suite 2800, New York, NY 10106; (800) 544-7377.

**GOLF SURFACES...**"The Complete Golf Surfacing Buyers Guide" contains a complete line of spike-resistant products like carpeting, rubber rolls and tiles, synthetic turf and ceramic tiles for indoor and outdoor applications. Authors are Scott Shaw and Daniel Jameson. To order a copy, phone R.S. Global Inc. at (800) 451-6762.



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# PRODUCT SHOWCASE

## Easy-start cutters have low weight, noise level

Two new easy-start commercial trimmers are now available from Husqvarna Forest & Garden. Both are powered by 22 cc engines, and feature the lowest weights



in their class, according to Husqvarna: 11.2 lbs. for the 120R and 10.1 lbs. for the 120L.

Each features a high-quality muffler molded of an aluminum alloy with an extremely low noise level of 91 dBa. They also both have a one-button injection starting system that dispenses with choking and half-throttling to start.

The 120L has a loop handle while the 120R has a bicycle handle; both are ergonomically designed.

**Circle No. 191 on Reader Inquiry Card**

## Easy equipment start-ups with guaranteed system

The Smooth Operator System is a series of integrated performance features that make every 25cc and 30cc Homelite product—blowers, hedge trimmers, cultivators and edgers—easy to start.

The unique compression release concept allows all users to start Homelite products with confidence. In fact, Homelite products with the Smooth Operator System are guaranteed to start.

Homelite makes six gasoline trim-

mers and brushcutters, four blower and blower/vac models, two hedge trimmers



and one edger with the Smooth Operator System. All have two-year limited warranties.

**Circle No. 192 on Reader Inquiry Card**

## Unprecedented combo on these front mowers

Kubota Tractor Corp.'s two FZ-Series commercial front mowers combine Auto Assist Differential (AAD), which allows automatic switching between 2- and 4-wheel drive, with the Zero Diameter Turn



feature (ZDT).

The FZ2400 has a full-tilt power steer-

ing wheel, tilt deck, a dependable shaft drive and optional round-shoulder turf tires for increased stability and traction.

FZ Series front mowers can be equipped with 54-, 60- or 72-inch decks, a 60-inch rear discharge mulching mower, grass catcher, utility blade, snowblower and soft-sided cab enclosure. They come with 20 or 24 hp liquid-cooled diesel engines.

**Circle No. 193 on Reader Inquiry Card**

## Compact mowers built small, big on performance

The 251K and 260K compact riding mowers from Excel have a true zero-radius turning feature to limit wasted motion.

Cutting height can be changed quickly for mowing and transport needs.

A low center of gravity gives the operator confidence on slopes.

The mowers have large capacity fuel tanks and fully pressurized engine lubrication systems.

**Circle No. 194 on Reader Inquiry Card**

## Mower built for maximum diesel fuel efficiency

The new Ingersoll 5118D is an 18-hp diesel zero turning radius mower is the latest in liquid-cooled diesel technology with energy efficient indirect injection combustion systems and smooth running 3-cylinder in-line design.

Powered by a Perkins engine, the front cut mower provides extra long life performance and fuel savings as compared to air cooled gasoline powered units.

The Ingersoll zero turn mower provides the extra performance of true All Hydraulic Drive with dual pumps that hydraulically power individual wheel motors for superior "zero" turn steering control and performance.

The company says the mower has exceptional hill climbing ability, thanks to the location of the drive wheels and weight distribution.

High blade tip speeds and ground speeds, combined with maneuverability of the zero turning radius makes for high speed mowing. A "flip-up deck" offers easy access to the blades.

**Circle No. 195 on Reader Inquiry Card**

# PRODUCT REVIEW

## Mulching accessory solves clipping disposal

The new Multipurpose Exmark Explorer II provides true zero-turn agility, ultra-smooth dampened steering and superior hillside traction and stability.

The 52-inch floating cutting deck provides a picture-perfect cut. The deck's new TriVantage design lets the user mulch, bag or discharge clippings.



Circle No. 196 on Reader Inquiry Card

## Mid-size mower line has a new, zero-radius addition with 44-, 48-inch decks

The Grasshopper markets the all-new Model 616, designed for consistent, efficient operation in a wide range of lawn



care applications.

The mower combines proven Grasshopper features with a Briggs & Stratton 16 hp engine for enhanced productivity and reliability.

An added feature is the advanced dual-hydrostatic direct drive.

Adjustable foam-padded dual levers offer complete control of all functions in the palm of the hand.

Outfront, low-profile PTO shaft-driven decks in 44 and 48 inches have interchangeable mulching deck options, plus Quik-D-Tatch Vac grasscatchers and attachments for year-round use.

Circle No. 197 on Reader Inquiry Card

## Recycler deck attaches to existing mower series; delivers clippings down

The Toro Company's new Guardian 623 Recycler Deck is now available.

The Guardian 62 is a new version of the Guardian 72, and can be retrofitted easily to the company's Groundmaster 200 Series mowers.

The deck is designed to force clippings downward, and confine them to the width of the mower, thereby decreasing the possibility of discharging any dangerous objects from under the deck.

Design of the deck eliminates clipping removal.

Circle No. 198 on Reader Inquiry Card

## Put a Front-Mount Millcreek Aerator on Your Commercial Mower.

Get more production and profitability from your John Deere, Ford, Kubota or Excel Hustler up-front mowers by attaching a front mount Millcreek core plug aerator.

Millcreek aerators have individually-mounted spoon wheels so you can make gentle turns without tearing turf. And our sturdy protective cage increases safety.

With so many styles and sizes, including 3-point hitch and tow-behind, choosing a Millcreek aerator is almost like designing one for yourself. All this and attractive pricing too. Call today for your free information.

- Fits Ford, John Deere, Kubota, Excel Hustler
- 42", 63", 84"
- 3-point hitch & tow-behind models
- Light-duty units also
- Individual spoon wheels
- Safety cage included



See us at Expo '94, Booth #649

**MILLCREEK**  
MANUFACTURING CO.

1-800-879-6507

2617 Stumptown Rd.  
Bird-in-Hand, PA 17505  
Dealer inquiries invited.

Circle No. 119 on Reader Inquiry Card

## WARM INSECT from page 33

occurred when tawny mole cricket mating flights had begun in many parts of the Southeast.

Coupled with a spring drought, these early season conditions influenced egg laying and egg hatch. In 1993, in many areas, there was no distinct "peak" tawny mole cricket hatch, and hatching extended well into July.

The spread of imported fire ants is limited by cold weather. Fire ant reproductives (males and females that reproduce)

## Subsurface placement of some insecticides results in the same level of mole cricket and grub control with half the rates of surface applications.

fly, mate and queens form new colonies primarily in the spring and fall after rain showers.

A cool, extremely wet or very dry spring may delay new colony development until conditions are more favorable.

**Chemical control**—Mapping areas of pest activity may narrow both treatment areas and amount of pesticide needed. Grubs and mole crickets usually reinfest the same "preferred sites" each year.

Timing is at least as important as the insecticide you choose. Most pest activity

## CULTURAL CONTROL

Integrating a cultural pest management program is neither easy nor inexpensive, but on-going industry research indicates that it can be a viable option to offer customers.

A knowledge of pest history at a site and knowledge of potential insect pests specific to location are important only in the context of frequent inspection of the turf. Proper fertilization, mowing and water use promote healthy turf which can recover quicker from pest damage. Thatch management may discourage development of some pests or enhance pesticide performance when properly timed treatments are necessary.

is influenced by soil and air temperature, moisture and life stage. So keep monitoring records: when insects first hatch, species and life stage, damage, and an overall evaluation of the turf quality.

Improvements continue for placing both liquid and granular insecticide below the soil surface for treatment of mole crickets and grubs. Subsurface placement of some insecticides results in the same level of control with half the rates of surface applications.

With subsurface applications, you have:

- fewer surface residues, which decrease the potential for runoff and human exposure;

- less potential for ULV breakdown; and

- placement close to the pests provides control with less product.

Saturated and poorly drained soil, however, and extremely hot and humid weather influence the effectiveness of liquid injection applications.

Remember also that the pH of the spray water may influence the effectiveness of any insecticide spray applications.

Some insecticides—like trichlorfon (Proxol or Dylox) acephate (Orthene) and isazophos (Triumph)—break down in high pH water. Use a commercial buffer to lower the pH of the water to 5.5 to 6.0 before adding one of these insecticides.

Pre-treatment irrigation may make the difference between success and failure during dry, hot periods. Pre-treatment watering does not replace watering after insecticides are applied. Rather, it moves soil pests closer to the surface, making contact with the insecticide more a possibility.

New products include:

- **Turplex** bioinsecticide (azadirachtin), registered for control of surface-feeders (Scotts ProTurf).

- **Vector WG** (*s. glaseri*) for white grub control; **Vector MC** (*s. riobravis*) for mole cricket control (Lesco).

- Mole cricket infecting nematodes (Biocontrol).

- **Exhibit** (*s. carpocapsae*) contains parasitic nematodes for control of billbugs, cutworms and sod webworms (Ciba T&O), as does **Vector TL** (Lesco).

- **Merit** (imidacloprid) is registered for turf (except on sod farms) and landscapes, including white grub control (Miles).

- **Scimitar** for control of several surface-feeders, chinch bugs and mole crickets (Zeneca).

- **Mainstay** (fonofos) for control of grubs, mole crickets, billbugs and others (Lesco).

- **Dylox** is now available as 6.2 formulation (AgrEvo, formerly NorAm).

- **Pageant DF** is a dry, flowable chlorpyrifos product. **Talstar** has received several state registrations (24c's) for fire ant, or fire ant and mole cricket control (FMC).

tivars with improved disease resistance. Where disease problems occur repeatedly, consider overseeding with blends and mixtures of improved cultivars. As with many kinds of biocontrol, genetic existence usually works for a single disease problem. That is why blends and mixtures are usually the most appropriate approach to healthy turfgrass. Genetic resistance is most effective when it is integrated with cultural practices and the judicious use of fungicides.

—Dr. Schumann is an associate professor of turf pathology at the University of Massachusetts, Amherst.

—Pat Cobb is professor of entomology at Auburn University, Ala.

## COOL DISEASE from page 26

prediction system for brown patch on perennial ryegrass has recently been developed at the University of Maryland.

Forecasts based on environmental conditions can help apply fungicides only when they are needed. They are particularly useful for extending spray intervals and eliminating applications when conditions approach, but do not quite reach those necessary for a severe disease outbreak.

They can help take the guess work out of fungicide applications and provide scientifically-based documentation for application decisions.

**Genetic resistance**—Breeding programs continue to offer new turfgrass cul-

# MARKET SHOWCASE

**Rates:** \$226 per column inch for 1x insertion; \$215 for 3x insertion; \$204 for 6x insertion; \$194 for 9x insertion; \$183 for 12x insertion (one inch minimum). Frequency based on calendar year. For ads using a Reader Inquiry Number, add \$35 to the total cost of the ad per issue. For ads using a second color standard red, blue, green or yellow only, add \$75 to the total cost of the ad per issue.

**Send ad copy with payment to:** Bill Smith, **LANDSCAPE MANAGEMENT**, 7500 Old Oak Blvd., Cleveland, Ohio 44130, or call (800) 225-4569 ext. 670 outside Ohio; (216) 891-2670 inside Ohio; FAX (216) 826-2865. VISA, MASTERCARD and AMERICAN EXPRESS accepted.

## EQUIPMENT FOR SALE



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Richard P. Bersnak, President

Jill A. Leonard, V.P.

**1-800-886-2398**

**FAX: 614-221-2203**

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**BADGER ASSOCIATES 1-800-822-3437**  
1108 Third Ave. New Brighton, PA 15066

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**BOX NUMBER REPLIES:** Mail box number replies to: LANDSCAPE MANAGEMENT, Classified Ad Department, 131 W. 1st St., Duluth, MN 55802-2065. Please include box in address.

## BUSINESS FOR SALE

**FOR SALE: LANDSCAPE DESIGN/BUILD FIRM** in beautiful Finger Lakes region of upstate NY. Average sales over \$400K annually. Profitable, turn-key operation. \$175K. Reply to LM Box 508. 5/94

## EQUIPMENT FINANCING

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## FOR SALE

**BREATHABLE NURSERY TARPS:** Stock and custom sizes, reinforced edges - grommets every 3 feet. Competitive prices - Free Delivery - Fast Service. We accept Visa/Mastercard. 1-800-888-9669, ask for Dept. LM394. 5/94

## BUSINESS OPPORTUNITIES

TVA plans to sell an exclusive license to make, use, or sell the products, or practice the methods comprising U.S. Patent Application Number 08/169,110, filed 12/20/93, "System for Improving Material Release Profiles," Trimm, et al. Such license will be subject to reservation of a nonexclusive, nontransferable, irrevocable, paid-up license by TVA, on behalf of the U.S. Government to practice or to have practiced the invention. Such license will be on a single, paid-up fee basis. It should be understood that further research and development will be required for production of a marketable product. TVA reserves the right to accept the highest offer and the award may be subject to approval by the TVA Board of Directors. TVA will receive offers to purchase the licensing until close of business (4:00 p.m. cst) on June 1, 1994. Additional information may be obtained from W. Keith Rylant, TVA, NFE 1F, Muscle Shoals, AL 35660, telephone 205-386-2835. 5/94

## EQUIPMENT FOR SALE

**PIPE LOCATOR INEXPENSIVE!** Locates, traces underground drain, water pipe lines of clay, PVC, ABS, steel, cement. Finds sprinklers, valves, clogs. Bloch and Company, Box 18058, Cleveland, Ohio 44118. (216)371-0979. TF

Brouwer 24 inch Sod Harvester, Ford 3910 diesel, 400 hrs. Excellent condition! Lights but no roof. \$20,000.00. Phone 517-332-8410. 6/94

Turfco Top Dresser, Model F-15 METER. New with only 4 hours use. For sale to highest bidder but the right is reserved to reject all or any bid. Sealed bids, clearly marked "Turfco Top Dresser", should be addressed to Mr. John Stokes, Embassy of Australia, 1601 Massachusetts Avenue, NW, Washington DC 20036 to arrive no later than 20th May, 1994. For more information call above at (202)797-3138. 5/95

**REINCO HYDROGRASSERS** and power mulchers in stock. Opdyke Inc., (Philadelphia Area) 215-721-4444. 12/94

**BUCKET TRUCKS:** Straight Stick, Corner Mount and Knuckle Boom Cranes. Brush Chippers: New Morbark Disc and Drum Style. New Rayco Stump grinders. Best prices anywhere. Used Chippers: Asplundh, Morbark, etc. 2 to 8 usually in stock. Sprayers, Dumps, Stakes, Log Loaders, Crew Cab Chip Box Dumps, Railroad Trucks, 50 in stock. Sold as-is or reconditioned. We also buy your surplus equipment. Opdyke's, Hatfield (Philadelphia Area). 215-721-4444. 12/94

**TORO "88" TRIPLEX-** Deck only, no tractor, complete with hydraulics, arms, and 2 sets of blades. Only 540 hrs. Super condition. Asking \$2,500.00. Call (603)641-7354. 5/94

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## HELP WANTED

**WANTED IMMEDIATELY:** Graduates in Forestry, Landscape, Horticulture, or Related Field. Entry level positions for Utility Forestry/Line Clearance pre-planning. Excellent tree identification and customer relation skills required. Please send resumes to ACRT, Inc., Utility Services, P.O. Box 219, Kent, OH 44240-0219 or Fax 216-673-3205. 5/94

**LANDSCAPE MAINTENANCE- IRRIGATION SUPERVISOR:** For largest landscape maintenance co. in nation. Need minimum 3 years supervisory experience in trouble shooting, scheduling, training and assisting in repair and retrofit large commercial irrigation systems. Thorough knowledge of all types of systems. English/Spanish bilingual a plus. Send resumes to: ENVIRONMENTAL CARE, INC., 825 Mabury Road, San Jose, CA 95133. 6/94

**LANDSCAPE MANAGER.** Large established firm with reputation for exceptional quality, seeking personable and enthusiastic individual to manage multiple crews in full service maintenance of high profile commercial properties; must have organizational and people skills as well as working knowledge of all phases of maintenance; 4 to 5 years experience with Southern Turfgrass & college degree preferred. Environmental Landscape Services, 5190 Crestview Drive, Memphis, TN 38134; (901)382-9000. 5/94

**Searching for the right employee? Time for a new position? Contact Florapersonnel, Inc., international search and placement firm for the landscape, irrigation industries and allied trades. Confidential. Fee paid by employer. Florapersonnel, Inc., 2180 W. 434, Suite 6152, Longwood, FL 32779-5008. Phone: (407)682-5151 Fax: (407)682-2318. TF**

## EDUCATIONAL OPPORTUNITIES

**HORTICULTURE- CORNELL COOPERATIVE EXTENSION, Rockland County, Thiells, NY.** Commercial hort/related environ. educ. programs. MS, 3 yrs. work exp. Send letter of intent, resume and transcripts by May 31, 1994 to: Box 26, Kennedy Hall, Cornell University, Ithaca, NY 14853. EOE. 5/94

**NOW... LEARN PROFESSIONAL LANDSCAPING AND GARDENING** at home. Accredited program provides thorough training in all phases of commercial and residential landscaping. Diploma awarded. Free brochure describes program and opportunities in detail. Call 1-800-326-9221 or write Lifetime Career Schools, Dept: LF0154, 101 Harrison Street, Archbald, PA 18403. 12/94

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## HELP WANTED

**CAREER OPPORTUNITIES-** Hermes Landscaping and Nursery, a solid, stable, and progressive company, headquartered in Kansas City for nearly 30 years, is seeking production and sales professionals. We are seeking both entry-level and experienced candidates for various production, sales and design positions in our Nursery, Landscaping, and Maintenance Divisions. Must have B.S. Degree. Send resume and salary requirements to: Hermes Landscaping, P.O. Box 14336, Lenexa, KS 66215 or call Tracy Strohm at (913)888-2400. 5/94

**GROUNDS MAINTENANCE OPPORTUNITIES:** Large Bay Area Grounds Maintenance Contractor with 30 + years experience in Human Services seeks qualified applicants for new Monterey Bay area contract. Applicants will train and supervise people with disabilities. Current DMV Printout req. of all applicants. **IRRIGATION CREW CHIEF/COUNSELOR:** Work with in-ground and mobile Irrigation equipment. Counsel, recruit, and train people with disabilities. **MOW/TRIM CREW CHIEF/SHOP MECHANIC:** Exp. in safe operation and maintenance of 60 in. + riding lawn mower, 48 in. walk behind mower and other grounds maint. equip. Competitive salary and benefits. Contact Liz at 415-453-6810 Ext. 115 for more info. Equal Opportunity Employer. 5/94


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3. Amount enclosed: \$ \_\_\_\_\_ (To keep our rates as low as possible, payment must accompany order)

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NAME \_\_\_\_\_ COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_

PHONE NUMBER \_\_\_\_\_

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**RATES:** \$1.45 per word (minimum charge \$46). Boldface words or words in all capital letters charged at \$1.75 per word. Boxed or display ads \$226 per column inch, one time; \$215, three times; \$204, six times; \$194, nine times; \$183, twelve times (one inch minimum). (Frequencies based on a calendar year.) For ads using blind box number, add \$23 to total cost of ad per issue.

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FIRM \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_  
STATE \_\_\_\_\_ ZIP \_\_\_\_\_

TELEPHONE ( \_\_\_\_\_ ) \_\_\_\_\_  
FAX NUMBER ( \_\_\_\_\_ ) \_\_\_\_\_

HAVE A SALES REP CALL ME 18  (A)

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106	123	140	157	174	191	208	225	242	259	276	293	310	327
107	124	141	158	175	192	209	226	243	260	277	294	311	328
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109	126	143	160	177	194	211	228	245	262	279	296	313	330
110	127	144	161	178	195	212	229	246	263	280	297	314	331
111	128	145	162	179	196	213	230	247	264	281	298	315	332
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MAY 1994  
This card is void  
after July 15, 1994

**1. BUSINESS & INDUSTRY**  
MY PRIMARY BUSINESS AT THIS LOCATION IS:  
(PLEASE MARK ONLY ONE IN EITHER A, B OR C)

**A. Landscaping/Ground Care at one of the following types of facilities:**

- 01  0005 Golf courses
- 02  0010 Sports Complexes
- 03  0015 Parks
- 04  0025 Schools, colleges, & universities
- 05  Other type of facility (please specify) \_\_\_\_\_

**B. Contractors/Service Companies/Consultants:**

- 06  0105 Landscape contractors (installation & maintenance)
- 07  0110 Lawn care service companies
- 08  0112 Custom chemical applicators
- 09  0135 Extension agents/consultants for horticulture
- 10  Other contractor or service (please specify) \_\_\_\_\_

**C. Suppliers:**

- 11  0205 Sod growers
- 12  Other supplier (specify) \_\_\_\_\_

Which of the following best describes your title:  
(mark only one)

- 13  10 EXECUTIVE/ADMINISTRATOR
- 14  20 MANAGER/SUPERINTENDENT
- 15  30 GOVERNMENT OFFICIAL
- 16  40 SPECIALIST
- 17  50 OTHER TITLED AND NON-TITLED PERSONNEL (specify) \_\_\_\_\_

I would like to receive (continue receiving)  
LANDSCAPE MANAGEMENT each month: YES  NO

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

NAME \_\_\_\_\_  
TITLE \_\_\_\_\_  
FIRM \_\_\_\_\_  
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CITY \_\_\_\_\_  
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TELEPHONE ( \_\_\_\_\_ ) \_\_\_\_\_  
FAX NUMBER ( \_\_\_\_\_ ) \_\_\_\_\_

HAVE A SALES REP CALL ME 18  (A)

101	118	135	152	169	186	203	220	237	254	271	288	305	322
102	119	136	153	170	187	204	221	238	255	272	289	306	323
103	120	137	154	171	188	205	222	239	256	273	290	307	324
104	121	138	155	172	189	206	223	240	257	274	291	308	325
105	122	139	156	173	190	207	224	241	258	275	292	309	326
106	123	140	157	174	191	208	225	242	259	276	293	310	327
107	124	141	158	175	192	209	226	243	260	277	294	311	328
108	125	142	159	176	193	210	227	244	261	278	295	312	329
109	126	143	160	177	194	211	228	245	262	279	296	313	330
110	127	144	161	178	195	212	229	246	263	280	297	314	331
111	128	145	162	179	196	213	230	247	264	281	298	315	332
112	129	146	163	180	197	214	231	248	265	282	299	316	333
113	130	147	164	181	198	215	232	249	266	283	300	317	334
114	131	148	165	182	199	216	233	250	267	284	301	318	335
115	132	149	166	183	200	217	234	251	268	285	302	319	336
116	133	150	167	184	201	218	235	252	269	286	303	320	337
117	134	151	168	185	202	219	236	253	270	287	304	321	338



MAY 1994  
This card is void  
after July 15, 1994

**1. BUSINESS & INDUSTRY**  
MY PRIMARY BUSINESS AT THIS LOCATION IS:  
(PLEASE MARK ONLY ONE IN EITHER A, B OR C)

**A. Landscaping/Ground Care at one of the following types of facilities:**

- 01  0005 Golf courses
- 02  0010 Sports Complexes
- 03  0015 Parks
- 04  0025 Schools, colleges, & universities
- 05  Other type of facility (please specify) \_\_\_\_\_

**B. Contractors/Service Companies/Consultants:**

- 06  0105 Landscape contractors (installation & maintenance)
- 07  0110 Lawn care service companies
- 08  0112 Custom chemical applicators
- 09  0135 Extension agents/consultants for horticulture
- 10  Other contractor or service (please specify) \_\_\_\_\_

**C. Suppliers:**

- 11  0205 Sod growers
- 12  Other supplier (specify) \_\_\_\_\_

Which of the following best describes your title:  
(mark only one)

- 13  10 EXECUTIVE/ADMINISTRATOR
- 14  20 MANAGER/SUPERINTENDENT
- 15  30 GOVERNMENT OFFICIAL
- 16  40 SPECIALIST
- 17  50 OTHER TITLED AND NON-TITLED PERSONNEL (specify) \_\_\_\_\_

I would like to receive (continue receiving)  
LANDSCAPE MANAGEMENT each month: YES  NO

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

NAME \_\_\_\_\_  
 TITLE \_\_\_\_\_  
 FIRM \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_  
 STATE \_\_\_\_\_ ZIP \_\_\_\_\_

**LANDSCAPE  
 MANAGEMENT**

**MAY 1994**  
 This card is void  
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LANDSCAPE MANAGEMENT each month: YES  NO

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

TELEPHONE ( \_\_\_\_\_ ) \_\_\_\_\_

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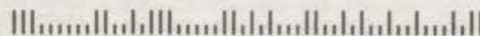
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