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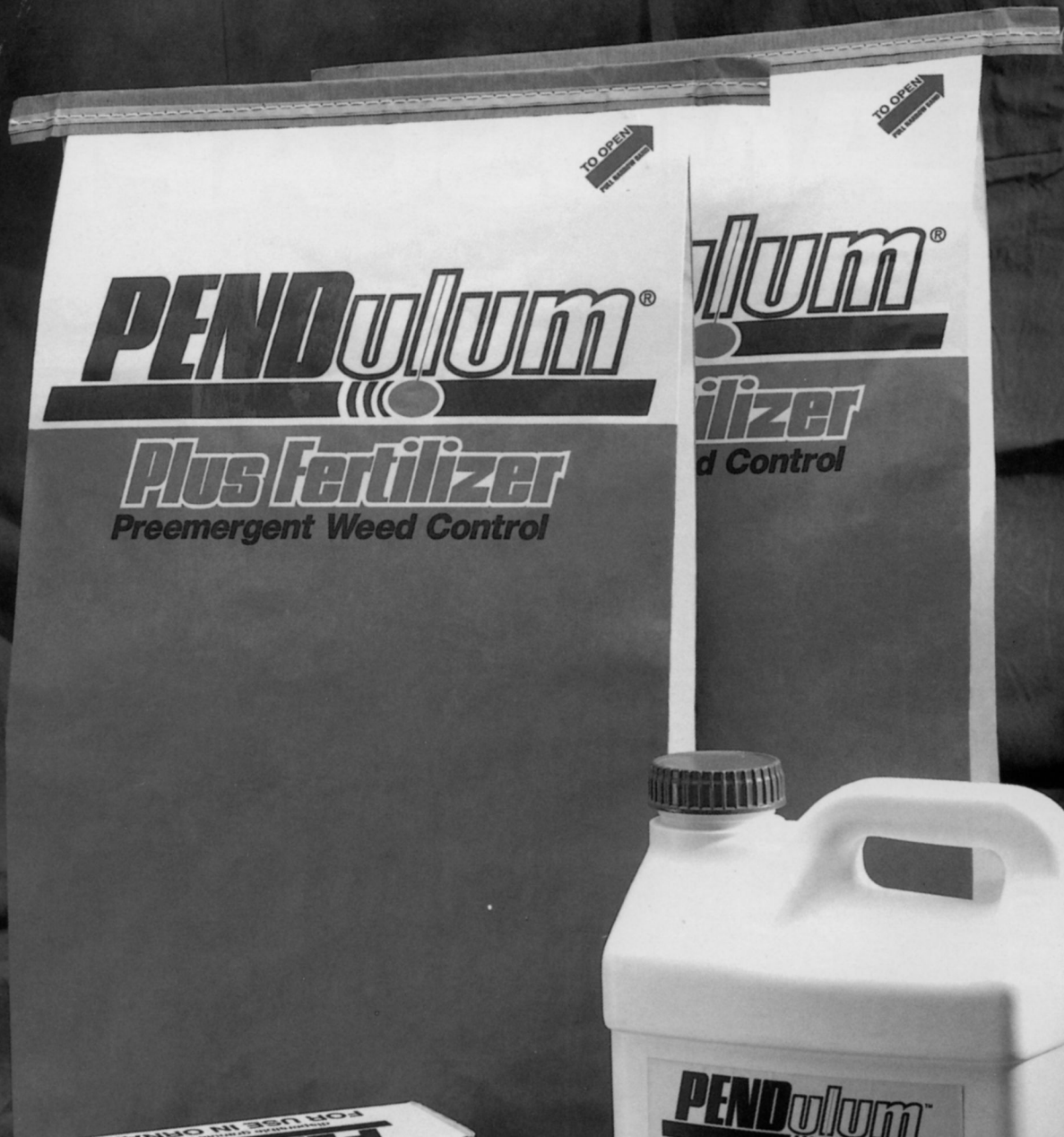
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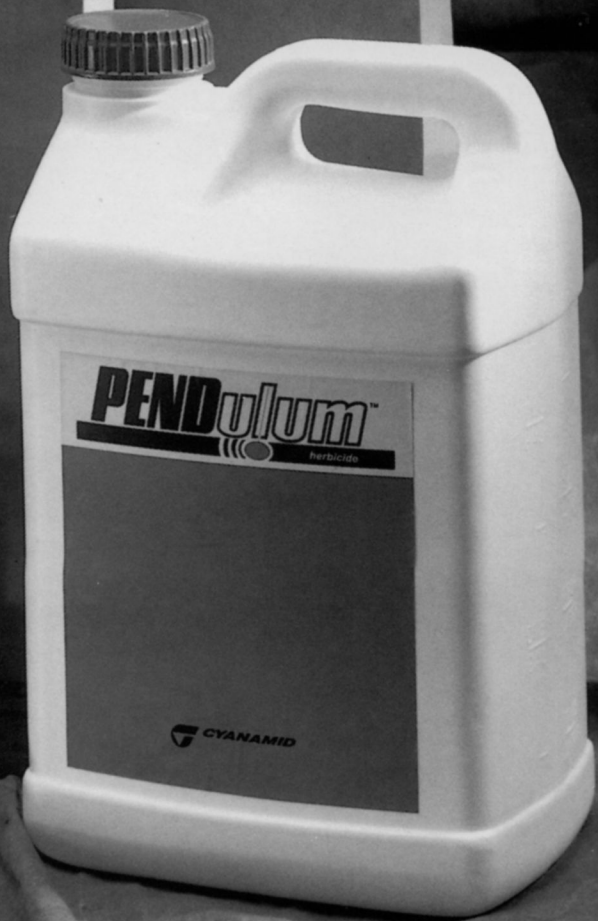
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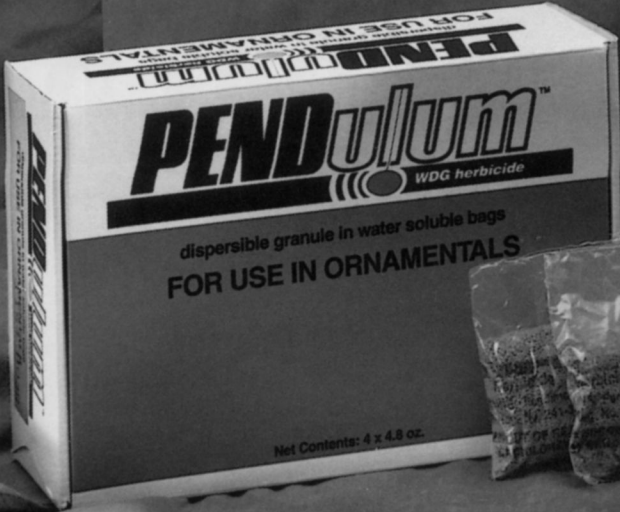
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PEAK AROUND THIS CLEVELAND, OHIO RESIDENCE.
PHOTO BY J. QUINN PHOTOGRAPHY

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So: where is the \$14,400 going to come from?



Jerry Roche

JERRY ROCHE
Editor-in-Chief

As you've probably heard, the minimum wage increases from \$4.25 to \$4.75 per hour, 30 days after President Clinton signs a bill now sitting on his desk. It will then increase to \$5.15 per hour next July 1st.

What you haven't heard—but can only speculate on—is the impact of this legislation on the nation, your operation in particular.

Economists disagree vociferously with each other. One academic study shows that increasing the minimum wage does not increase unemployment.

A similar study with supposedly more accurate data reaches the opposite conclusion.

Another study suggests that raising the minimum wage also triggers recessions and a rise in poverty rates.

Republicans contend that increasing the minimum wage could force small businesses to lay off 100,000 to 500,000 workers over the next several years.

Granted, very few minimum wage jobs exist

in this industry. Most line-level jobs pay \$6 to \$9 per hour, depending on the section of the country in which you're doing business. But Ben Bolusky of the American Association of Nurserymen believes the green industry will see a "trickle-up" effect, forcing companies (golf courses, too!) to pay crew members higher wages—maybe not the full 90 cents an hour of the official increase, but a percentage of it.

Consider this: The average small business with 10 minimum-wage employees working 40 hours a week for 40 weeks a year will pay \$14,400 more per year in wages if those employees receive a 90-cent an hour raise. We can all agree that's not a small amount.

And just where will that money come from? Some could come from an additional provi-

sion of the bill that has been pretty much underpublicized: the government is offering \$14 billion in tax relief to small businesses over the next 10 years, some of which will be for buying equipment.

The ceiling for equipment credits (not "deductions") is going up from \$17,500 this year to \$25,000 by the year 2003. Every dollar you spend to purchase equipment—under the ceiling that year—is a dollar you don't have to pay in income tax. Not a bad deal.

But some of the extra money you'll be paying employees will have to come from other lines in your budget. As we see it, here are four of your obvious options:

- 1) Pay good workers more, and figure out a way to get more production out of them.
- 2) Pay good workers more, but cut out some of their benefits.
- 3) Pay good workers more, and reduce your profit margins.
- 4) Fire one of every 15 workers now employed.

None of these is especially attractive to the business owner or golf/athletic field supervisor.

My guess is that the most judicious answer to the problem of higher payrolls might need to come from the manufacturing segment. Simply put, over the next few years they will have to supply new products that are faster, more efficient and easier to use—mowers, hedge-trimmers, fertilizer spreaders, herbicides, blade-sharpener—whatever. This will mean that your employees, with the proper training, will be more productive.

In the meantime, because you work in a labor-intensive business, productivity remains the key to running a profitable operation. If you're not using the most efficient products on the market, and training your employees in their proper use, your competitors are getting a head start on you.

LM

Comments? Suggestions? Contact Jerry by phoning (216) 826-2830 or faxing (216) 891-2675. If you are computer-connected, you can e-mail 75553.502@compuserve.com.

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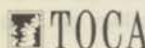
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A rocky bed for landscape shrubs

Will replacing bark mulch with 1/4-inch stone in shrub beds cause any long-term problems with the growth and development of the shrubs? Plantings are made up of mostly pines, yews, junipers, azaleas and rhododendrons.

—NEW YORK

A review of information relevant to your question indicates that there isn't a simple "yes" or "no" answer. I've seen stones, pebbles, gravel and other inorganic materials used as mulch, but I'm more familiar with the organic mulches like wood and bark chips.

Here are some problems with rock mulches:

1) When rock mulch is used, there is usually a sheet of plastic film beneath it. The plastic, usually black, is for weed control and it may cause problems for woody plants. Often, this will result in poor aeration and too little or too much moisture in the underlying soil. Poorly-aerated, wet soil plus the root and collar organisms commonly found under such conditions can cause root loss, reduced growth, and/or death of the entire plant.

2) When the rock mulch has been in place for several years, it is—in my opinion—not very attractive because weeds grow in or on the litter that accumulates among the stones.

3) It is more difficult to remove leaves and decomposing plant material from large beds of rock mulch. With most of

the organic mulches, such debris simply blends in.

4) The appearance of bark-mulched beds can be easily improved by a topdressing of fresh material. Renovation of rock-mulched beds, however, means removing the existing layer of rocks, putting down new plastic, and spreading around new or clean stones.

5) Where black plastic isn't used, weeds are a problem. Herbicides often become the only means by which to keep the beds free of these unwanted plants. And repeated contact with herbicides through drift and/or root uptake can injure or kill the desirable plants.

6) When the bed gets a lot of sunlight, the rocks store heat, and high temperatures can kill or injure roots and emerging or thin-barked plants. If the rock, stone or pebbles are of calcareous origin (for example, limestone), the mulch may increase soil pH to the point that pines, junipers, azaleas, rhododendrons and even the yews suffer from micro-nutrient deficiencies.

The main reason people use stones is because they think that once rock mulch is installed, no further maintenance is required. This isn't necessarily so, as we've shown.

It is true that bark mulches have to be topdressed periodically, and that occasional weed control is necessary. However, in the long run, you will probably have fewer plant and appearance problems with bark mulch.

Whitefly control: flip a coin, any coin

We are having a severe problem with whiteflies on ash trees. We are thinking of using products such as Merit, Talstar and Astro. What is your opinion about these, as far as whitefly control?

—CALIFORNIA

Insecticides such as Merit, Talstar and Astro are labeled for whitefly control on ornamentals. However, I am not quite sure how well they will perform.

Based on my discussions with entomologists, I believe that either Talstar or Astro should perform well. However, I do not personally have much experience with these products.

Merit can be used either as a foliar treatment, soil injection and/or drench. I believe most information on whiteflies is obtained on greenhouse crops. I am not familiar with any outdoor use of Merit for whiteflies. However, I do believe that it should work well. Try on a small scale and become familiar with its performance.

Read and follow label specifications for better results.

(Ed. Note: Bayer Corp. literature indicates that Merit can be used for whitefly control on ornamentals.) **LM**



BALAKRISHNA RAO
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PLANT DIAGNOSIS

by JERRY ROCHE /
Editor-in-Chief

It's August, the lawn is brown in unusual, irregular patches. Your client is howling with disapproval because he's paying you good money to keep it green.

So what's the problem, Ace? Has the customer failed to turn on the sprinkler system, or has irrigation missed a spot or two? Is it one of those funky diseases you're always reading about—brown patch or maybe leaf spot? Or have the insects taken control of the lawn?

You don't have a lot of time; if the problem isn't resolved soon, you stand to lose another customer.

Worse yet, if you're a golf course superintendent, your most influential members are howling. You begin to perspire, and it's not from the 90-degree temperatures, either.

"Diagnosing plant problems is difficult and requires discipline and diverse knowledge," says Jim Chatfield of the Ohio State University Cooperative Extension Service. "Yet everyone wants an instant and simple answer, not to mention an inexpensive and certain solution."

"The best diagnosticians, the best horticulturists, learn every time they go onto a landscape. Diagnosis is both an art and a science. There are occasional 'gimmies,' but more often than not, your diagnosis will not be proven or certain."

So you get down on your hands and knees with your



Can you diagnose this problem?

trusty hand lens, looking for telltale signs. You grab your handy Swiss Army knife and cut out a small plug. Aha! Too much thatch, you think, which is having a detrimental effect on water availability to the

plant. We must aerate and adjust the irrigation schedule, you reason.

A week later, the grass is still brown, and if you were perspiring before, you're really sweating now.

How many times has this happened in your career? Don't feel lonely; it happens to every turf manager on a pretty regular basis. Even though your success depends on knowing what the problems are, you've doubtless mis-diagnosed problems before.

Write us, using the form below, to relay your experiences to 52,000 other turf managers—so they won't make the same mistake. Tell us what you thought the problem was, what it really was, how you found out and what you did about it. If we publish your observations and hints, we'll mail you a free LANDSCAPE MANAGEMENT painter's cap. □

Your turn

Every other month, we report what readers think about current topics. Tell us how you correctly **DIAGNOSED** a tough agronomic problem. Tear out or photocopy this page, and fax or mail your response to: Talk Back, Landscape Management, 7500 Old Oak Blvd., Cleveland, Ohio 44130 • Fax: 216/891-2675 • E-mail: 75553.502@compuserve.com

What plant malady have you had the hardest time diagnosing? Why?

COMMENTS _____

How did you finally correctly diagnose the problem?

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Composts vs. peats: composts win



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Composts vs. peats: composts win

by RON HALL/ Sr Editor

Composts can improve soils and the establishment of turfgrass, including turfgrass for athletic fields and putting greens, says soil scientist Dr. Ed McCoy.

In fact, research suggests that, in some respects, composts out-perform native peats, a more traditional and widely-used soil amendment.

Composts are mixtures of decomposing vegetation or other organic materials. They're manufactured from a variety of organic waste sources, many of which previously would have been hauled to landfills.

Like peats, their primary function is to add organic matter to soils. Organic matter, explains McCoy, "buffers" turf from the environmental demands placed on it.

But very real physical and chemical differences exist between native peats and composts, says McCoy, an educator and researcher at The Ohio State University.

Composts have:

- ▶ less organic matter content than peats,
- ▶ finer texture than peats,
- ▶ lower cation exchange capacities, and
- ▶ higher levels of soluble salts. (This may not be as big a problem as it seems if irrigation leaches the salts through the soil.)

McCoy has, for several years, been testing composts,

all of which have different characteristics although not, obviously, as broad as their differences with peats.

He's learned that composts: increase soil organic matter, reduce soil bulk density, increase the infiltration rate of heavy soils, and they can "assist" in suppressing some turf diseases.

While composts are increasingly being used to amend soils of home lawns and athletic fields, their use in sand USGA-specification putting greens is still being investigated.

"There's a real concern that these composts—with low organic matter contents (relative to native peats) and fine textures—may not perform suitably in a situation such as a putting green where we have to have very rapid water drainage, rapid infiltration, and we want to maintain large pore openings," says McCoy.

To help shed light on that concern, McCoy tested six rootzone mixes: three contained composts and three used native peats. He blended the six amendments—at one percent and three percent by weight—with sand to produce USGA-type rootzone mix.

He packed 12 inches of each mix into identical columns, and, by using a layer of coarse material, created a perched water table in each column. Then he seeded each column with identical, and recommended, rates of creep-



Ed McCoy sees more use in turfgrass for composts.

ing bentgrass.

The mixes containing the composts produced better germination and early growth

than the mixes containing the peats, says McCoy. Also, the mixes with composts were significantly more permeable.

During drought and traffic tests the turfgrass growing in the compost mixes performed at least as well, and often better, than turfgrass growing in the peat mixes.

"I've had lots of surprises working with compost. It seems to be performing very well," says McCoy. "I think there's a real opportunity for the use of those materials (composts) in the future."

McCoy spoke at the OSU Short Course earlier this year from which this report was compiled. □

Landscape certification: coming to your state?

Six state and regional landscape associations are looking into the Certified Landscape Technician tests being used in California, and 13 more states have already adopted a similar test.

Landscape associations representing Utah, Texas, Colorado, Illinois, Wisconsin and Maryland/Virginia/D.C. were on hand when the California Landscape Contractors Association administered its CLT test earlier this year.

John Riffel and Eric Schultz of the Associated Landscape Contractors of Colorado express enthusiasm about certification as a change agent. "It's definitely helped our industry," they say. "We're starting to see the effects on the commercial side, and we expect the demand for CLTs in the residential markets will follow."

The CLT test was developed 13 years ago, sold to the Associated Landscape Contractors of America two years ago, and has grown each year.

"This is our best test ever," says Henry Buder, CLCA's state

Barefoot buys Hydro Lawn

Barefoot, Inc., announced in mid-July that it had bought Hydro Lawn, Inc., based in Gaithersburg, Md.

Barefoot is the nation's second-largest lawn care company with expected revenues of about \$130 million in 1996. The company reported revenues of \$95 million in 1995.

Hydro Lawn was founded 24 years ago by Jerry Faulring, one of the founders and the first president of the Professional Lawn Care Association of America (PLCAA). Faulring, who has been involved with a plant nursery the past several years, was unavailable for comment.

Barefoot president and CEO Patrick J. Norton says: "Hydro Lawn is another example of Barefoot acquiring a quality company to add to its portfolio of premier companies." Hydro Lawn had revenues just under \$4 million in 1995.

The acquisition adds to Barefoot's customer base in the Washington, D.C. and Baltimore market areas. It reportedly has several other operations there. Barefoot has 53 company locations and 46 franchise locations, primarily in the central and eastern United States.

Hydro Lawn is just the latest of a string of lawn care operations to be absorbed by either industry giant TruGreen/ChemLawn (1995 revenues of \$578 million) or Barefoot which is based in Worthington (Columbus), Ohio.

Early in 1995, Barefoot acquired the customers of 11 northern lawn care branches of Orkin Lawn Care. A year earlier, it purchased seven Lawnmark locations in New York, Vermont, and Maine. □

certification test chairman. "In fact, we simply couldn't accommodate the demand, and reluctantly had to turn away several applicants. For the last two years, the tests have consistently sold out."

The ultimate goal, says CLCA state certification committee chairman Dave Wolkenhauer, is to create a recognized standard. He was among representatives from 15 states who was responsible for writing the test.

"We wanted to make the test more accessible and more consistent, and to offer more options for test-takers," Wolkenhauer explains. "This restructured format allows for more specialization as well as continued growth of the program."

California's construction test received the biggest makeover this year. The committee scaled it back from two days to one and renamed it the landscape installation test. Problems on irrigation, carpentry and concrete were deleted from it because, beginning this fall, separate certifications in carpentry and concrete will be offered.

"This new format is more flexible and therefore more easily adaptable to other states," says Kim Heckes of CLCA. "But not every problem or even every test is appropriate for all locations." For example, Illinois and Wisconsin, two of the states set to launch CLT programs this year, will not offer the irrigation test because it is not an issue in their climate.

For more information, call Heckes at (916) 448-2522. □

Bang! You're disease-resistant

Herbicide-resistant bent was first; disease-resistant tall fescue could be next 'shot from a gun,' if Scotts researchers are on track.

by JERRY ROCHE / Editor-in-Chief

Using a "gene gun," researchers at The Scotts Company believe they can produce brown patch-resistant tall fescue grass—soon.

"We think we'll have a genetically-engineered tall fescue seed that is absolutely brown patch-resistant in the next year," says Kevin Turner, manager of seed production and research at the Scotts facility in Gervais, Ore. "We believe we'll be able to make it available [to buyers] within four years."

The "gene gun," invented by Dr. John Sanford of Sanford Scientific Inc., can deliver DNA into turfgrass and thus improve the turf's desirable characteristics. Scotts and Sanford Scientific signed a cooperative agreement earlier this year, which led Scotts to prepare a dedicated genetic engineering laboratory.

Genetic research will be conducted at the Dwight G. Scott Research Center in Marysville, Ohio. Initial work on the program was directed by Dr. Virgil Meier, but Dr. Lisa Lee will now assume its reins.

Dr. Lee and a Rutgers University research team used the gene gun to develop a bentgrass that is resistant to a widely-used weed control product, making it possible to selectively control most weeds without affecting the bent.

"We are extremely excited about using this technology," says Dr. John Neal, who is Scotts' vice president for research and development. "Employing genetic engineering will allow our researchers to add desirable traits as well as speed up the process of turfgrass variety development."

Scotts estimates seven years to create and market a genetically-improved turfgrass, compared with 12 to 15 years without genetic engineering. □

SPREADERS

A quality spreader assures that seed, fertilizer and dry chemicals 'hit the ground running.'

by TERRY McIVER / Managing Editor



The Grotech multi-purpose spreader has universal mounts.

Your "ground level" plan for turf and landscape management should include a spreader that matches the size of the job, and is versatile enough to carry and deposit a variety of products.

Art Downing, sports field supervisor for the Howard County, Md., recreation and parks department, looks at spreaders from four angles:

1) **Easy to load.** This means the hopper has to be wide enough to accept the bag of material that you're loading, and low enough so you don't have to lift the bag very high off the ground.

2) **An agitation device that works.** Pelletized lime, for example, works much better in spreaders than the powdered variety, says Downing.

3) **Ease of operation.** Gauges should not be complicated, says Downing, requiring only "an easy on or off."

4) **Consistent spreading pattern.** This is important whether it's a tractor model that throws material 25 feet, or a walk-behind model with a spread of 5 feet. In the walk-behind category, Downing prefers spin models over drop spreaders.

"If you don't walk the exact pattern, [drop spreaders] will miss," he says. "They're great for powdered lime, but that's about all."

You won't have uniform turf color and vigor if your spreader puts material down unevenly. This means the spreader chute or ports must be cleaned before and after every application, or at least given a good look to check for clogged particles.

Drop spreaders may also not apply materials evenly if the driver or person walking behind it is not moving at an even pace. Too fast an application may result in missed spots or inadequate coverage. Too slow an application will cause materials to be applied heavier than necessary.

High-capacity walk-behind models reduce the labor involved in refilling the hopper repeatedly on the same site. Spreaders from Agri-Fab, for example, come in 100-lb. push models as well as 125-lb. or 175-lb. tow-behind models. **LM**



Vandermolen's Windmill spreader, above, has an effective spreading width of 40 feet. At left, the Gandy drop spreader can be used as a walk or tow unit.



Jacobsen's SV System Vehicle with spreader attachment. The spreader carries 14 cubic feet of material.

AGRI-FAB
(217) 728-8388
Circle No. 200

The Model 45-0238 is a tractor-mounted spreader that carries up to 100 lbs. of material. The spreader is compact, with a reliable design that ensures even and continuous flow and spread of materials. Spread width is 10-12 feet. The unit is driven by a 12-volt motor and comes with a poly wrap-around shield to reduce the spread width to four feet, and a vinyl cover.

EARTH WAY
(914) 356-8300
Circle No. 201

Distributed by Landscapers Supply Corp., Earth Way Ev-N-Spred commercial spreaders have large, easy rolling jumbo tires. Nylon wheel bushings ensure long, maintenance-free operation and smooth travel. All tractor pull and push models feature large enclosed gears with a full, 2-year unconditional guarantee, a self-cleaning design and a controlled feathered-edge broadcast.

C & S TURF EQUIPMENT
(800) 872-7050
Circle No. 202

The Turf Tracker is a riding spreader/sprayer unit that allows the operator to apply a granular product or spot application of liquids at the same time. Application speed allows the operator to cover one acre in 10 minutes. Zero-turn allows high maneuverability in heavily landscaped areas.

CHANDLER EQUIPMENT CO.
(800) 243-3319
Circle No. 203

"Low profile" golf course spreaders have capacities from three to five tons. A standard PTO belt drive is set up for 540 or 1000 rpm PTO or both. The dual hydraulic hook-up with hydraulic flow is supplied by tractor. A self-contained hydraulic drive with direct mount pump mounts to the tractor PTO. The "High profile" model is available in 304 stainless steel, 409 stainless steel painted or heavy-duty carbon steel.

GANDY
(507) 451-5430
Circle No. 204

The 6500 series of spreaders are 4, 5 and 6-foot-wide models for

heavy-duty jobs. Use them to fertilize, apply seed, herbicides, insecticides, fungicides and nematicides. Four- and five-foot models can be ordered with a handle to maneuver in small areas. Two rotors are independently driven from each end with three lengthwise rods spaced uniformly around the core for gentle agitation and free material flow.

GROTECH
(800) 725-8377
Circle No. 205

The MPS-125 is a multi-purpose spreader to mount on any tractor, utility vehicle, front mower or truck. A simple trailer attachment enables the user to pull the unit behind a golf cart. The MPS-125 spreads evenly, regardless of the throttle rpm or terrain. The spinner height adjusts 24 inches vertically, on a three-point hitch mount. The spread pattern adjusts from 4 to 40 feet.

HIGHWAY EQUIPMENT CO.
(319) 363-8281
Circle No. 206

The L2020GT has a 50-lb. capacity. The successor of traditional spinner spreaders, the unit resists corrosion, reduces bridging and improves spread patterns. A carbon steel hopper is fully welded, caulked, and painted with an advanced corrosion-resistant paint system developed to endure years of use. The hopper body is 96 inches wide.

JACOBSEN
(414) 637-6711
Circle No. 207

The SV System Vehicle comes with a spreader accessory that carries 14 cu. ft. of materials. The working width ad-



The Turf Tracker has a spreader mounted on the front. The Spyker Spreader, below, has responsive controls.

justs from 20 to 66 feet. It installs with brackets on top of the polyethylene hopper (with formed steel frame) for lifting. The SV hydraulic system provides the drive. One spout is used for sand and salt applications, another for seed and fertilizer.

LESCO
(800) 321-5325
Circle No. 208

The Mark II is made with a new frame and handle assembly that features stiffer construction to reduce bounce and provide more comfort and easier pushing for the operator. To better accommodate applicators of all sizes, the spreader has longer, adjustable handles and a wider handlebar. A simplified calibration adjustment improves application accuracy and establishes uniformity when calibrating a fleet of spreaders.

MARUYAMA
(206) 885-0811
Circle No. 209

The MG10 granule spreader carries seed, fertilizer and other dry chemicals, up to 2.9 gallons in capacity. The model MG10 features very uniform distribution and an 18-foot range. The spread pattern can be set for left or right side, or a 180-degree coverage. It has a 10 position adjustable discharge volume and tank agitator to eliminate clumps or jamming.

RIVERSIDE GARDENS
(607) 729-2292
Circle No. 210

The Applicator's Friend shield encloses the rear portion of fertilizer spreaders to reduce operator exposure to materials. The shield

does not affect the spreader operation or spread patterns. The Applicator's Friend shield is thermoformed from durable, high-tech, corrosion-resistant materials. The shield can be cleaned easily with water, and it can be attached in minutes.

SPYKER SPREADERS
(219) 774-8122
Circle No. 211

Pro Model spreaders from Spyker have been improved and are now available to the green industry. Spreaders include the "Big Spread" spreading spinners, and Model 78-22 with instant action spread/no spread. Stainless steel frames are optional. The "Big Spread" distributes material in a wide, level distribution pattern.

UNITED HORTICULTURAL SUPPLY
(503) 678-9000
Circle No. 212

Commercial broadcast spreaders from UHS feature linear, low density polyethylene construction. Gears are made of Nylatron GS, and are self-lubricating, with superior wear characteristics. Nylon 6/6 axle and wheel bearing are also self-lubricating, with excellent wear and load-carrying ability.

VANDERMOLEN CORP.
(201) 992-8506
Circle No. 213

The Windmill Spreader Model 510 features a granular capacity of 400 lbs., and an effective spreading width of 40 ft. The Windmill spreads all types of seed, and can handle salt and sand. The Windmill is designed for smaller tractors in the 16 to 28 hp range. □



1996 EMERALD AWARDS

READERS PREFER *Echo, Toro, Lofts*

'What are your favorite brand names?' we asked our 51,000 readers last spring. Some of their choices were overwhelming.

by JERRY ROCHE / Editor-in-Chief

Echo, Inc., of Lake Zurich, Ill.; the Toro Company of Bloomington, Minn.; and Lofts Seed of Somerset,

N.J., were big winners in LANDSCAPE MANAGEMENT's "Emerald Awards" sweepstakes/contest held earlier this year. Each green industry supplier was named "favorite" in two categories by LM readers.

Echo was first among reader faves in the leaf blower and line trimmer categories, while Toro finished a strong first in both

the riding and walk-behind mower categories. Lofts' varieties, Rebel and Palmer, won the turf-type tall fescue and perennial ryegrass seed categories, respectively.

Double-winners

Bill Peel says Echo's prime concern in the professional market—where 90 percent of its equipment is sold—is making sure the end-user is happy.

"One of the biggest concerns from our research is power-to-weight ratio," the company's director of marketing notes. "We try to comply with the users' requests by working with landscapers to build operator comfort. We have a team of professionals that works with landscape managers to field-test our equipment. In addition, we also know that people who buy the equipment base their purchasing decision on recommendations from their employees who use the equipment, and on input from other landscapers."

Everyone also knows the Toro name, but the company's success is the result of hard work.

"We have a world-class team of designers and engineers," says Brian Masterson of

Echo trimmer



Kubota tractor



Toro Groundsmaster mower



Toro. "Before any product goes to market, we test it, then it goes out to dealers and cutters—and if they don't like it, we re-design it.

"We take care of some of the best courses in the world. The Toro name is synonymous with quality and top-notch beautification equipment."

Equipment

Other winners in the equipment categories were Kubota (compact tractors), Ryan (aerators), Ford (pick-up trucks) and Stihl (chain saws).

Jackson D'Armond of Stihl, Inc., says the company relies heavily on its network of dealers and distributors to learn what customers want.

"We get feedback on what's in demand, how to improve products, or if there's anything going wrong with products," says D'Armond. "We have to be able to respond. We have very high quality standards, and that's one of the things we believe makes our products excel. We try very hard to listen to the market."

Paul Williams of Kubota says the company takes an extra step to talk to the people on the front lines.

As part of Kubota's "Product Quality Management System," the company's regional service engineers and other representatives often visit end-users to ask them to evaluate Kubota products.

"We basically ask, 'How do you like your Kubota?'" says Williams. "We cover general questions about what they like and what they don't like, from ease of handling to maintenance. We obtain a wealth of

Ryan aerator



information."

Dave Ferguson of Ryan says the aerator manufacturer holds focus groups prior to new product releases. It's one of the ways the company has stayed competitive.

"We get [end-user] opinions on what features they'd like to see," says Ferguson.

Fertilizers & pesticides

In the fertilizer/pesticide categories, favorites were Scotts (fertilizer), Sandoz's Barricade

Echo blower



and Monsanto's Roundup (herbicides), DowElanco's Dursban (insecticide), ISK's Daconil 2787 (fungicide) and Ciba's Primo (growth regulator).

Susie Calhoun knew Scotts "trounced" the competition before we even told her.

"I think part of it is due to our patented technologies with years of proven performance, and the fact that our tech reps are out there calling on the customers one on one, providing services and consultation, and being a partner in turf maintenance programs," says Calhoun. "That, coupled with good products, is the reason for the awareness."

Gene Hintze of Sandoz credits Barricade's performance in the field for its performance in the Emerald Awards contest.

"The thing that people like about Barricade is that it's a consistent performer," says Hintze. "They know what they're going to get year in and year out. It doesn't matter if it's a wet year or a drier year, Barricade is still going to perform." Hintze, who credited distributors for some of Barricade's popularity, says Barricade has been on the market

Stihl chain saw



Ford truck




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Circle No. 117 on Reader Inquiry Card



for just four years.

Ciba's Primo was unveiled at the GCCSA Convention in 1993. Described as a new generation of PGR, end-users discovered that it makes grass grow shorter, denser and stronger.

"We're seeing Primo being used in markets other than golf, markets like sod farms, sports turf, cemeteries and commercial mowing management," says product manager Jose Milan. "Primo has a fairly broad use pattern."

Dursban insecticide is 25 years old and is still going strong, which Phil Howard of DowElanco says is a result of "doing a lot of things right over a long period of time.

"You can't get into this industry overnight with just a lot of flash," says Howard. "There are a lot of other things the industry demands, one of which is quality products. They know what to expect with Dursban. We are continually asking customers how we are doing, and what customers would like to see us do to improve quality."

Turfseed

Favorite turfgrass cultivars were Baron (Kentucky bluegrass), Manhattan and Palmer (perennial ryegrasses) and Rebel (tall fescue). Dipel topped the list of favorite biological control products.

"Baron was the first improved Kentucky bluegrass to be available," says Tom Peters.

"Barenbrug of Holland had

an excellent research program, and brought it to the U.S. [20 years ago]. It's an excellent seed producer, with a good yield and good return per acre, which are all reasons why growers like it so much," says Peters.

Readers selected Lofts' Rebel tall fescue and Palmer perennial ryegrass. Dr. Rich Hurley of Loft Seeds says breeding work on both cultivars began in the 1960s by Dr. C. Reed Funk at Rutgers University. The first variety of Rebel came out in 1979, fol-

lowed in 1985 by Rebel II and then Rebel, Jr.

"In the future, we're going to have a Rebel XL and we're going to have a Rebel 2000. They will probably be coming out in two years," says Hurley, who points out that much of the germplasm of turf-type tall fescues can be traced back to Rebel material. Palmer ryegrass made its commercial debut in 1982-83, he says.

Manhattan is also an old-timer, according to Steve Tubbs of Turf Merchants.

"Manhattan is one of the original perennial ryegrasses," notes Tubbs. "Reed Funk found it in Central Park in New York, and it's been a high-quality program since 1969. Anybody who's ever gone to a turf school has heard of Manhattan, so you're talking 25 years of brand awareness. And today the name is more important than the product because it's hard to get a bad perennial rye."

Turf-Seed co-markets Manhattan, and has for years.

Superintendent wins \$500 prize



Chalifour: Industry is competitive

Bob Chalifour, superintendent at Shennecossett Golf Course, Groton, Conn., took the first prize of \$500 in LANDSCAPE MANAGEMENT's Emerald Awards sweepstakes.

A superintendent for 26 years, Chalifour and his crew try out equipment thoroughly before a purchase is made.

"We discuss the pros and cons of each brand," explains Chalifour, who cuts to the chase when considering a product, and looks immediately for product benefits.

"We look at the equipment from an operator's standpoint: What can the machine do?" says Chalifour.

Ease of service is also on Chalifour's list of important product benefits.

Chalifour says he used to be a very brand-loyal buyer, however, over the years, the equipment industry has become "very competitive," as more companies have appeared on the scene.

"Years ago, we had mostly one brand," recalls Chalifour. "The [competing] companies didn't have the service or equipment to do the job. Now, we have several 'colors' here at Shennecossett."

Chalifour says he relies on university data when he needs

to make a control product purchase. "I'm 45 minutes from the University of Rhode Island. They do extensive testing there."

In fact, Shennecossett is used as a test site by Rhode Island researchers.

The \$300 second prize goes to Pete Yerkich, superintendent at Highland View Golf Course, Butte, Mt.

Yerkich also values equipment trials, as well as a thorough look at product literature.

"I read up on it, learn the options they have, then judge the performance," says Yerkich.

If it's a greensmower Yerkich is evaluating, it is used on all 18 Highland View greens, not just one or two. He also wants his employees to give equipment a whirl.

Yerkich oversees one full time worker, two seasonal, and three summer helpers.



"We've been involved since the beginning," notes Turf-Seed's Tom Stanley, "when Bill Rose and Dick Bailey went back to Rutgers and got the original germplasm and started the Manhattan Ryegrass Growers Association. It was the first fine-leaved perennial ryegrass, a big improvement over Linn.

"We've always had the best germplasm available to work with. Woodburn High School near here has a football field planted to the original Manhat-

tan ryegrass, and it is still the best-looking football field in the area."

The contest/sweepstakes entry form was published in the magazine for four straight months. Most overwhelming responses came from fans of

Echo line trimmers and leaf blowers (30 and 35 percent, respectively), Stihl chain saws (48 percent), Ryan aerators (46 percent) and Ford pick-ups (43 percent). **LM**

—Additional reporting by
Terry McIver and Ron Hall.

The course is owned by the city.

Just as Yerkich demands the best performance from his equipment, so too he appreciates dedicated employees who are truly interested in the job.

"Workers have to put their heart and soul into the job," Yerkich believes. "If you don't have the love for the work, you won't do well."

Cindy Molter, our third prize winner of \$200, operates Circle M Lawn/Landscape of Benton Harbor, Mich.

A former landscape manager at a golf course, Molter relies on dealer support for parts and product information. She calls herself a brand-loyal buyer in certain product categories, especially mowers.

She uses Toro mowers, Medalist turfseed and a "a lot of Scotts" products. □

—Terry McIver

1996 EMERALD AWARD-WINNERS

Top scorers (only) in each category,
listed as percentage of total votes

WALK-BEHIND MOWERS

Toro	22
Scag	11
John Deere	9
Jacobsen	8
Ransomes	7

RIDING MOWERS

Toro	24
John Deere	11
Jacobsen	9
Ransomes	6
Scag	5

LINE TRIMMERS

Echo	30
Stihl	19
Shindaiwa	11
Toro	6
Red Max	5

LEAF BLOWERS

Echo	35
Shindaiwa	7
Toro	4
Green Machine	3
Lesco	3

CHAIN SAWS

Stihl	48
Echo	12
Husqvarna	9
Poulan	6
McCullough	5

AERATORS

Ryan	46
Toro	10
Lesco	4
Ransomes	3
Cushman	2
Jacobsen	2

PICK-UP TRUCKS

Ford	43
Chevrolet	32
Dodge	10
GMC	9
Toyota	3

COMPACT TRACTORS

Kubota	24
John Deere	23
Ford	15
Case	2
Massey-Ferguson	1

FERTILIZERS

Scotts	31
Lesco	17
Lebanon	7
Par-Ex	3
Andersons	2
Milorganite	2

PRE-EMERGENCE HERB.

Barricade	10
Surflan	9
Pre-M	7
Team	6
Pendimethalin	5
Scotts	5

POST-EMERGENCE HERB

Roundup	24
Trimec	22
Lesco 3-way	8
Confront	4
Acclaim	4

INSECTICIDES

Dursban	27
Merit	13
Diazinon	6
Dylox	6
Orthene	4

FUNGICIDES

Daconil 2787	19
Chipco 26019	7
Bayleton	5
Scotts	4
Fore	3
Banner	3
Touché	3

PLANT GROWTH REGS.

Primo	17
Embark	9
Atrimmec	6
Scotts TGR	3
Cutless	1
Limit	1

BLUEGRASSES

Baron	4
Glade	2
Midnight	2
Park	2

RYEGRASSES

Manhattan (&II)	5
Palmer (& II)	5
Lesco Eagle	3

TALL FESCUES

Rebel*	8
Jaguar	3
Bonanza	2
Bonsai	2
Falcon	2
*Rebel includes original Rebel, Rebel Jr., Rebel 3-D, Rebel II	

BIO CONTROLS

Dipel	4
Bacillus thuringiensis	3
Lesco Vector	2
nematodes	2
ladybugs	2

ANATOMY OF A

Great Mulcher



► Mulching mower attachments can be used when a new mower is not in your immediate plans.

by BILL KNOOP,
Ph.D. / Technical Editor

M

It takes the right combination of deck volume, blade speed and engine horsepower to make a good mulching mower.

Mowing is so routine—82 percent of this magazine's readers do it—that it is sometimes taken for granted. But without a good mowing program, the money you spend on fertilizer, water and other cultural practices may be completely wasted.

Every turfgrass has its own best mowing height. They are not hard, fast measurements, but do apply under what we call "normal conditions." Under con-

ditions such as high heat, raising the mowing height of cool-season turfgrasses to the upper mowing range helps prevent heat stress.

Environmental factors may cause mowing heights to be adjusted, but so does the intended use of the turf. The turf used for athletic fields and golf courses should be cut just as low as the plant will stand.

We've all heard the 1/3rd rule: don't cut off more than 1/3rd of the leaf system each time you mow.

It's been proven time and time again.

In a very real way, turf quality can be affected by mowing frequency. Overall quality will suffer if the turf is allowed to grow too high between mowings. To a point, the more frequently a turf is mowed, the better quality it is. This assumes that it is receiving optimal amounts of fertilizer and water and that the climate is favorable. Frequent mowing may also allow you to maintain a turf at what otherwise might be considered an abnormally low mowing height.

The real practical mowing issue has always been, "How can a quality turf be produced in the fastest possible mowing time?" The faster it can be mowed, the more that can be mowed, and the better the profits. Of course, the customer must be happy with the results, and this means turf quality.

How fast a mower moves in its forward gear is not the only way speed is created. For the past several years, we've been faced with a very important environmental issue that has affected us: the demise of the landfill. Bagging grass slows down any mowing operation and increases labor costs. The best way to take care of the grass clipping issue is to leave

cont. on page 26



GOOD BREEDING ENDURES. CUTTER.

The mandate: to develop a "cutting edge" variety of perennial ryegrass exceeding the quality and environmental demands of the most rigorous turfgrass professionals.

After years of intensive breeding and rigorous testing, Pickseed's Research and Development Team fulfilled the promise, to a tee.

THE WINNER: CUTTER PERENNIAL RYEGRASS

In the 1993 NTEP trials, *Cutter* ranked number 1 out of 123 entries in mean turfgrass quality and is proving to be one of the best perennial ryegrass varieties ever developed.

Highly recommended for use on athletic fields, playgrounds, golf courses, home lawns — any area where a fast-starting, attractive turf is desired — *Cutter* is very compatible with other cool season turfgrasses.

In fact, *Cutter* — along with Express and Edge — will lead its enduring pedigree to a new generation of perennial ryegrass blends this fall, with the introduction of Futura 3000.

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cont. from page 24

them on the turf; don't pick them up at all.

And the best way to leave clippings on the turf is to use a mulching mower, which cuts the clippings into very small pieces. The smaller clippings decompose much faster and tend to disappear down into the turf right behind the mower. This means no stopping to empty bags and no bags to carry off for disposal. Remember, these clippings have nutrient value and in a real sense you are giving your customer a free fertilizer application each time you mulch-mow.

Years ago, true mulching mowers were hard to find, but now every mower company has them. Some, of course, are better than others.

It takes the right combination of deck volume, blade speed and horsepower to make a good mulcher.

1) The mulching chamber must be of such volume that the freshly-cut grass clip-

pings don't go directly down into the turf, but enter a circulation pattern that allows them to be cut and re-cut several times.

Most mowing decks are not thick enough (the distance between the blade and the top of the deck mowing chamber), which is very crucial. Five inches seems to be ideal. If the distance is any less, there may not be enough volume in the mower deck to allow proper circulation of the clippings.

2) Maximum blade tip speed should be between 18,000 and 19,000 feet per second under load, measured at the blade tip. A slower tip may mean that the grass clippings don't get re-cut small enough before they fall to the turf.

3) The size of the mower must be adequate. Most commercial mowers run between 14 and 22 horsepower engines. The drive system should be designed so that the maximum amount of horsepower is available for the cutting unit. Some of the bet-

ter machines may have up to a 75 percent transfer of power from the engine to the cutting unit. This means that they can use less energy to achieve the same results as a higher-powered, less fuel-efficient mower.

A good mower should have one more very desirable characteristic: the ability to follow the contour of the landscape independently of the power unit. Very few turf areas are perfectly flat. Ideally, the deck should float in all possible directions. More than likely, that same turf area contains trees, shrubs, flower gardens and other obstacles. This means that the more maneuverable the mower, the faster it can get the job done.

Mowers are not all alike. There are big differences under their skin. Take the time to learn the features. Ask questions. Remember, the mowing program can make or break the quality of any turf, and the choice of a mower can make you more—(or less!)—money. **LM**

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SEED UPDATE:

Roundup resistance, more endophytes, advances in *Poa* (bluegrass) species

by JERRY ROCHE / Editor-in-Chief

"The professional turf manager's job is on the line 365 days a year," claims Jim Carnes, a pioneer in the commercial turfgrass growing and marketing business. "This person needs to rely on the seed to perform to his expectations. Cheap seed will not get the job done." Carnes, addressing a group of turf man-

Northwest, where most of the world's proprietary turfgrasses are grown:

1) Kentucky bluegrass that can be mowed down to ½ inch.

"Jacklin research has made some tremendous strides in Kentucky bluegrass breeding," notes Dr. Doug Brede of Jacklin Seed. "Besides being leaf spot-, disease- and stress-resistant, we're looking at the low-cut fairway tolerance and adaptation of 7500 experimentals.

"Our new Kentucky bluegrasses have been mowed down to ½ inch and they've performed extremely well. This is a totally new phenomenon for bluegrass. They are in seed production now, and should be in full production by 1997."

2) Grasses that are "Roundup" resistant.

Pure Seed Testing is working on perennial ryes, fescues and creeping bents that are resistant to lower rates of Roundup.

"If a turf professional had a variety from these selections, he or she could use the Roundup to control *Poa annua* without discoloration to the turf," Crystal Rose-Fricker says. "The thing is that it's a half-pint rate, and it's only the resistant lines. The resistant lines keep their color, and they may be stunted, but it'd look acceptable enough. You could apply the Roundup three or four times a year and it'd be pretty safe."

Fine fescues—specifically hard fescues—are more tolerant of the Roundup, but ryegrasses and bentgrasses are very susceptible. Some tall fescues, however, show some promise "but we're at least three years from going commercial," Rose-Fricker notes.



Dr. Jim Beard (left) discusses the merits of Netlon as an additive to athletic turf soils, while Turf-Seed Field Day attendees observe a traffic/wear tester in motion.

agers, distributors and growers at a Turf Merchants event two months ago, went on to say that the seed grower, like the turf manager, is "under the gun."

But perhaps the people under the most pressure to produce are the breeders. They are embroiled in a hopeless, never-ending battle to find the perfect grass. And, given weather-related problems over the past 10 months, turfseed this year will certainly not be cheap.

Here are some significant ongoing projects, based on a June trip to the Pacific



Dr. Doug Brede of Jacklin Seed Company explains the company's aggressive Kentucky bluegrass breeding program.

3) Kentucky bluegrass and creeping bentgrass with enhanced insect resistance due to the presence of endophytes.

Jacklin, under the guidance of researcher Suichang Sun, is trying to breed Kentucky bluegrass and bentgrass with endophytes, which enhance insect resistance.

Seven species of bluegrass are being

Kevin Morris tells Advanta Seeds West Field Day attendees that the National Turfgrass Evaluation Program has apparently been saved from budget cuts by the U.S. Department of Agriculture.



used as endophyte hosts. "We believe these hosts are genetically closer to Kentucky bluegrass than [endophyte-enhanced] bluegrass plants previously obtained," says Sun.

In addition, nine bentgrass plant lines have been infected with endophyte. "Even though less than one percent of the seedlings were successfully inoculated," Sun continues, "we have obtained enough plants to form a breeding population."

Not that there aren't problems, or that more research isn't needed.

"The people who are experimenting with endophytes," notes Steve Tubbs of Turf Merchants, "haven't been able to keep them in the grass."

While Jacklin is using injection, Pure Seed Testing is importing samples of possible endophyte-enhanced bluegrass from France, Australia and Czechoslovakia. And The Scotts Co. is using a unique new "gene gun" to zap endophyte into grasses (see "Hot Topics").

4) New uses for colonial bentgrass, *Poa trivialis*, *Poa supina* and Texas bluegrass.

"A lot of people in the Palm Beach, Fla., area are overseeding their greens with 60 percent colonial bent and 40 percent *Poa trivialis*," notes Craig Edminster of International Seeds. "Creeping bent really needs a little heat to get going, and then come spring when you want to transition out of your cool-season grass, the creepers are tough and won't transition out. So you

QUOTES FROM THE COAST:

from Dr. Bruce Clarke, Rutgers University:

- ▶ "Manganese seems to reduce the susceptibility of bentgrass to take-all patch, and the triazole fungicides—plus a new experimental fungicide called Heritage—will revolutionize take-all patch control."

from Mike Robinson, Seed Research of Oregon:

- ▶ "We are doing a lot of work with the fine fescues, including blue fescues that are stress-tolerant and low maintenance. Dr. Leah Brillman is also looking for a good slender creeping red fescue."

from Dr. Melodee Fraser, Turf-Seed:

- ▶ "Tar Heel tall fescue is now in production and will be on the market this fall. It has good heat and drought tolerance, and is brown patch-resistant. It's also dark green and, because it has endophytes, is insect-resistant."

from Dr. Doug Brede, Jacklin Seed:

- ▶ "The advantage of the new tall fescues is that they blend very well with Kentucky bluegrass, even five years after planting. The best mixture, by seed weight, is 75% tall fescue, 25% bluegrass."

from Dr. Jerry Pepin, Pickseed West:

- ▶ "We'd like to develop tall fescues that do a better job further south, and have brown patch and pythium resistance. We're really having problems getting good tall fescue for use in areas like Atlanta and Dallas, so we're doing a lot of screening in those areas."

from Craig Edminster, International Seeds:

- ▶ "We've got two new experimentals in the NTEP that we're going to try to compete with Bardot colonial bentgrass. Better quality and much better seed production; Bardot's never been a very good seed producer."

take colonial bentgrass and mix it with Sabre (*Poa trivialis*) and have an elite-looking turf with early growth.

"The real key this year is that perennial ryegrass may be short, and if such is the case, or if prices are way up, one way to spread costs is to use poa triv as a component of the overseeding mixture."

With weather extremes the norm rather than the exception, research in

southern climates is focusing on heat tolerant, low-water use plants.

"We don't have normal weather conditions any more," observes Dr. Ronnie Duncan of the University of Georgia, speaking at an Advanta Seeds West event. "We're too hot, too cold, too wet, too dry. So you sometimes have to use grass species that are better buffers to the extremes. And Texas A&M, at its Dallas experimental sta-

tion, is working on a hybrid Texas bluegrass and Kentucky bluegrasses that are extremely heat tolerant."

According to David Lundell of Finelawn Research, Dr. John Stier at Michigan State University has found that *Poa supina* has some applications in the sports turf category.

"It looks like *Poa supina* can be used in high-wear areas, shaded areas, golf course roughs, athletic fields and high-use home lawns," Lundell observes.

Availability, pricing

The turfseed industry was visited by a quartet of plagues in 1995-96.

"The biggest losses are to chemical damage, but we had the flood, we had the slugs, we had the cool weather," says Dr. Jerry Pepin of Pickseed West.

"Yet the crop looks real good. Tall fescue and ryegrass acres are reduced, but the yields should be good."

Tom Stanley of Turf-Seed says there's been a 10 percent reduction in perennial ryegrass acreage and a 30 percent reduction in fine fescue acreage over the past two years, "and that means stronger prices." There's also "not enough tall fescue seed to meet demand, and it's going to be difficult to increase the acreage because of the high price of wheat."

Adds Edminster: "The seed crop is looking good, but it'll come up short. The spring moisture will delay the bentgrass crop, but there will be [outstanding] yields. Tall fescue is short and won't be inexpensive this year."

Kentucky bluegrass acreage is about the same as last year, so Stanley "doesn't foresee any shortages."

"Fine fescue acres dramatically reduced over the past three years due to cheap Canadian creeper," reports Turf Merchants International.

TMI also reports that its Kentucky bluegrass crop is at its "best in 10 years." However, reports TMI—as of mid-July—an "extremely short" crop of Kentucky 31 turf-type tall fescue has driven turf fescues to "a sold-out or very high-priced position in the market." **LM**

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Transplanted trees gasp for oxygen

Arborist Dr. Carl Whitcomb wonders how transplanted trees ever survive being uprooted and replanted.

"Transplanting is a tremendous challenge to the plant," explains Whitcomb. "Even with a relatively small plant, we're cutting off everything but just a few roots, and then trying to get the tree to withstand the stress until it can re-establish itself on the new site."

Oxygen is often depleted during a plant relocation, when the soil is so compacted that no more air pockets remain for root uptake. Transplanting time can be an opportunity to do

some things to ensure sufficient oxygen reaches the rootzone. That's when you should make sure not to overwater. Make sure the hole is large enough for the root ball. Loosen the soil around transplanted trees.

Roots killed off by heat stress will eventually regenerate, says Whitcomb, "but if you're a bacterium or a fungi looking for lunch, what better place to go? The pathogens tend to invade those roots much faster than if you just physically cut them off in a pruning-type process.



Note situations following rain where water does not drain properly. These are sites where plant decline occurs.

Get energized

"What's inside the plant tissue at the time you transplant it is far more important than what you do to the new site, with the exception of loosening and aerating the soil," advises Whitcomb. "There's no magic potion to add to the planting hole to assist root growth. You can't grow new roots without energy. You've got to have the assorted sugars and starches in there to begin with."

Compost might help the tree to establish, but don't fill the hole with compost; spread it around the site.

"If it degrades and provides some nutrients, or keeps the soil a little warmer or cooler (depending on the time of year), or

enhances some microbial activity, it probably helps. But the thing that makes the root growth isn't fertilizer or nutrient absorption after transplanting, it's stored energy that was in that root before. What you do with that plant in the nursery setting has a dramatic influence on how rapidly those roots grow."

With a tree and most shrubs, if you only amend the planting hole, you're only amending a very small fraction of the soil that the plant is going to use. Whitcomb recommends that you amend the entire rootzone to destroy texture, water movement and aeration "barriers."

Phosphorus a fantasy

Phosphorus will not help root growth, says Whitcomb. Sugars and starches from the leaves make the roots grow.

"What is important is anything we can do to enhance the energy output of the plant's leaves. If available phosphorus is low, adding phosphorus will

help the leaf output. Beyond a certain point, however, phosphorus actually suppresses the uptake of iron and manganese and other critical ingredients, and it can become detrimental to growth."

Use the application window

The bulk of the root growth on woody plants occurs in August through October. The highest tissue energy level is going to be just before the plant goes dormant in the fall. Whitcomb urges landscape managers to take advantage of it.

"The soil's warm, the energy's there, and plants—particularly container-grown plants—will produce roots in that surrounding soil at a phenomenal rate."

New shoot and leaf growth will ultimately contribute to this total energy accumulation inside the plant.

Soils, nutrients key

"Know what's in the soil and don't let the plant go hungry," says Whitcomb. "I don't care if you just transplanted it yesterday. If that soil test says the nitrogen is extremely low, apply some nitrogen!"

Adding nitrogen can benefit plant growth. But beyond a certain threshold, nitrogen stimulates weak, spindly growth. The plant's store of reserves is low and you begin creating future problems—winter injury or disease or insects. Proper levels of all elements enhances resistance to aphids, grasshoppers, or spider mites. **LM**



Whitcomb: 'Don't fall for the old fable that says you don't fertilize newly-transplanted plants.'

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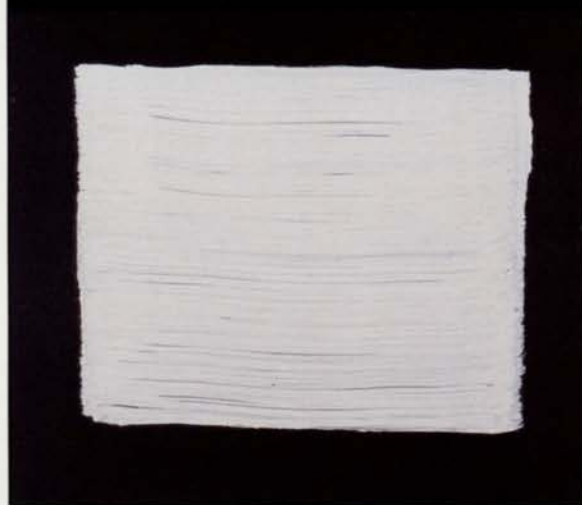


Initial Application



After Moderate Simulation

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Initial Application



After Moderate Simulation

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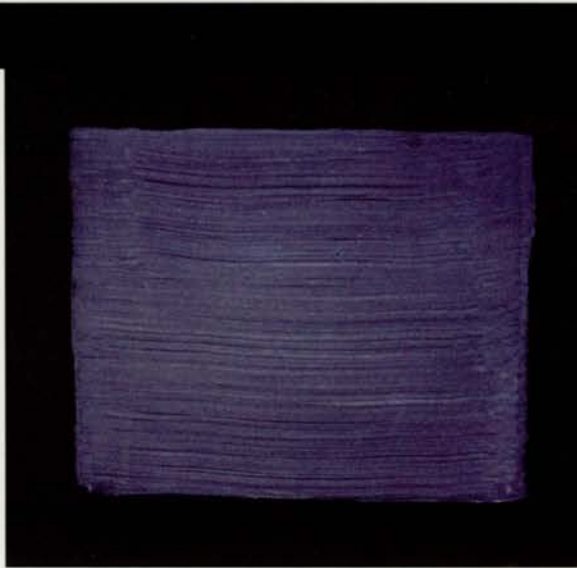
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It's been another great summer of dealing with "contingencies," those things beyond our control that we all face at one time or another.

► Howard County, Md. is in "a cost-effective mode," says Art Downing, sports field supervisor for parks and recreation.

"What is normally a 4 or 5 lb. nitrogen application is now down to 2 lb. It saves about \$2000-\$3000 a year," estimates Downing.

A wise decision? Perhaps, since many turf nutrition experts say "spoon-feeding" with lower nitrogen levels is good for turf.

Downing says the number of acres that they fertilize has also been cut.

"We used to fertilize the whole park," says Downing. "Now, we just do the larger open areas, not the turf along walkways, or islands."

Layoffs are part of the picture, too. That's hard to take, with 35 softball fields and 27 football/soccer fields to manage, and a staff of eight that is now down to two. Downing

says turf has to be grown at three inches.

► Neil Campbell, of the Birmingham, Mich. public schools, oversees 15 athletic fields.

His summer has had the usual turf restoration projects, but spring was late.

"We had snow on Mothers Day," says Campbell, which is actually a pretty novel way to help you remember that day.

"We had a late jump on the season," says Campbell. "Some opportunities were lost, because we had to take care of the problems."

Campbell plans to try crumb rubber as a soil amendment, based on research by Trey Rogers at Michigan State University. Crumb rubber has been proven to reduce turf impact and compaction.

► Bob Dale, supervisor of grounds for the

You can deal with what comes along



Terry McIver

TERRY McIVER
Managing Editor

GOLF/GROUNDS

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Heat stress easy to aggravate

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Making fairways greens-like

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Groundsman waits for normal

PAGE 12 G ►

GCSAA plans 21st century PR

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Pine needles as a ground cover

PAGE 16 G ►

Siphons a cure for wet fairways

University of Evansville, has a multi-use field that couldn't take all the wear and tear from soccer, summer camp activities and intramural sports, so he seeded with a common bermudagrass. Hybrid bermuda, he determined, wouldn't be able to handle all the traffic at an inch-and-a-half cut.

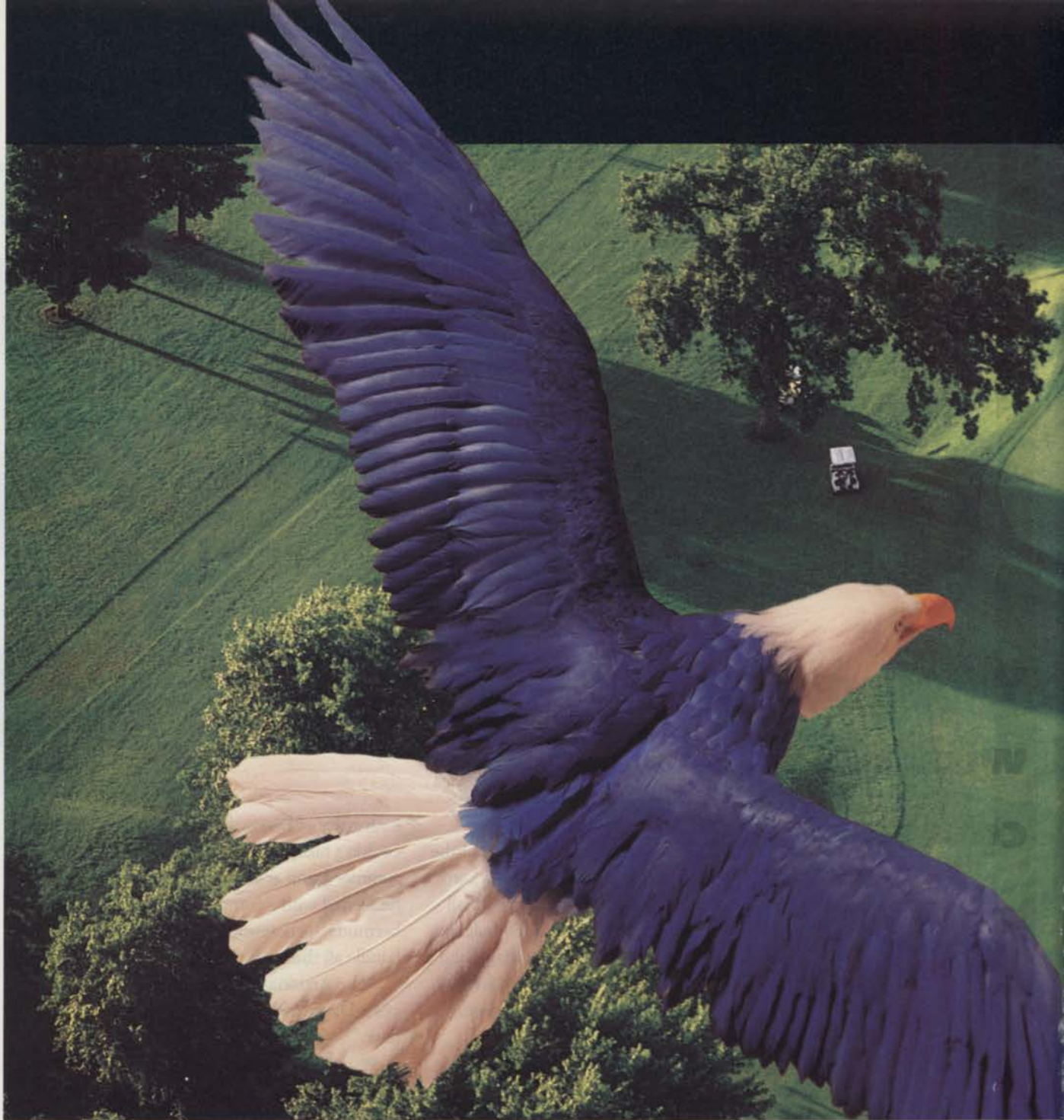
"The Arizona common filled in quickly," reports Dale, "and the field was in play five weeks later."

► Larry Group, a landscape architect for the Lincoln, Neb., parks and recreation department, tells of some of the regulations in place for playground areas: rubber padding, minimum "safety distances" between toys, and height restrictions on jungle-gyms and sliding boards.

I knew that businesses like to program brand loyalty into kids, but this is a twist.

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2/96

Heat stress

EASY TO AGGRAVATE!

by TERRY McIVER / Managing Editor

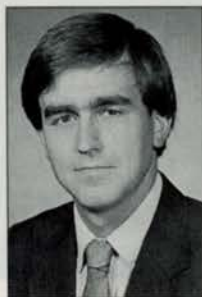
By now, we probably have an idea of what the rest of the summer will bring, weather-wise. If it's as hot as it was in 1995, remember that one turf stress compounds others.

Trouble down below

Rick Brandenburg, professor of entomology at North Carolina State, says that what might normally be tolerable heat stress is worsened due to root-feeding insects such as grubs, mole crickets or billbugs.

"Marginal root-feeding damage is often put over the limit because the damaged root system is not as healthy as it should be," says Brandenburg, who often writes on a variety of insect control topics.

"Whatever the root feeder may be," says Brandenburg, "the heat stress is in play a lot earlier than under normal conditions. You always have some insects chewing on some roots, so it's always a tough call for a lot of landscape management people who ask, 'Is the damage manageable, or is treatment required?'"



Brandenburg: Marginal root-feeding by insects takes turf over the limit.

Brandenburg suggests scouting for insects, and reminds turf managers to study up on insect lifecycles—especially during times when damage can be most severe—so you can make a timely treatment decision.

Watch greens specs

George Hamilton, agronomy instructor at Penn State University, believes soil moisture content isn't tracked as well as it should be in golf greens with modified soils.

"The all-sand or highly-modified greens are susceptible to hydrophobic conditions and localized dry spots," says Hamilton.

Re-wetting the turf is an option, but it may not work beyond a certain point, as

lack of adequate soil interface will result in poor capillary rise of water.

To compound the problem, a large percentage of what are called "USGA spec greens" are no such thing, according to Hamilton. He says that some contractors and greens managers are not



Hamilton: Water turf early in the morning to reduce evaporation time.

truly knowledgeable of what goes into proper greens construction, and don't know how to properly supervise the person who is building the greens. Unfortunately, says Hamilton, some intentional corner-cutting often occurs.

"One of the main criteria is that, depending on the materials used, the rootzone mix should cover a full 12 inches, but often doesn't," attests Hamilton.

"If you start skimping on your 12 inches—say to 9 or 10 inches, you're sav-

ing 10 to 20 percent, but the greens will in theory be wetter due to the shallow mix."

The "choker" layer (the intermediate layer between the rootzone and gravel layers) is supposed to let the water perch. With newly-written, tighter USGA specs, the intermediate layer allows perching and rootzone sand to stay separate.

"If you've been told you are getting USGA spec greens or that you have USGA spec greens, have them analyzed in terms of particle size, physical properties and depth."

Aerify early

In fall and early spring, you can prepare greens for heat stress by infrequent, deep irrigation to promote good rooting into the soil profile. "Frequent, light watering causes shallow rooting, and the plant does not have rooting capacity," says Hamilton.

Remember that syringing is not the same as full-volume watering. Syringing is to be used only as a cooling agent.

If you have wilting or heat stress, you may not be using appropriate cultivation methods to start with. In fall, therefore, implement proper cultivation practices so the plant is able to use water most effectively.

Wetting agents allow areas to get maximum use of minimal rainfall, but can also serve as a form of chemical stress.

"Fairways are analogous to athletic fields, where cultivation may be limited due to the size of the area," says Hamilton. "Fairways and intermediate roughs tend to be neglected, which causes bentgrass fairways to develop a thatch layer, which interferes with proper rooting. The thatch hardens, and causes water to run off sloped areas."

Spiking is one type of cultivation

method that can be done in August without adding stress to turf, says Hamilton.

Up the cut

"You can best reduce mechanical stress by changing mowing practices," insists Hamilton. "Go to a higher mowing height and decrease mowing frequency. A 64th of an inch means a lot to a turfgrass plant."

Adds Bruce Branham, professor of weed science at the University of Illinois: "Raising mowing heights will help you attain a better water use rate, cooler turf and more shading and cooling of the root crown."

Follow windows

Hamilton advises against sterol inhibitors in times of heat stress. "There may be some growth regulation which is another kind of chemical stress," he says.

"I've gone to using systemic fungicides with contact fungicides. That works well," says Bob Chalifour of Shennecossett Golf Course, Groton, Conn., who adds that he waits a long time between applications.

"If the label says 7 to 21 days, I try to go the full 21 days," says Chalifour.



Chalifour: No greens rollers in high heat.

Chalifour says he also has been using Astron soil amendment from Floratine to help enhance root growth.

"We pull up nice, solid plugs, better than we've ever seen before," says Chalifour, who believes a good soil

aeration program can't be beaten when it comes to long-lasting benefits.

Chalifour mows the Shennecossett greens at $\frac{1}{2}$. No rollers are used.

Chalifour aerates greens in early spring and fall. He also uses topdressing, fertilizers and prudent fungicide applications.

Dr. Bob Carrow of the University of Georgia has recommended topdressing bentgrass greens with material that is dry and easy to integrate into the turf with minimal brushing. Brush material in at a slow speed across the green, Carrow advises. □

Fungicides & aeration: a one-two punch

"We were very fortunate not to lose much grass [in 1995]," says Dan Albaugh, superintendent of Ruffled Feathers Golf Club in Lemont, Ill., where the greens, tees and fairways are 100 percent bentgrass.

"We had 24 days when the temperature was 82 degrees at 4:30 in the morning. Typically, we get two days like that. So we were primed for disease last year," tells Albaugh.

In the South, Tim Davis at Cabarrus Country Club, Concord, N.C., had to protect 130,000 sq. ft. of bentgrass greens.

Combine control methods

When stress conditions are at peak levels, the key to effective disease control is to follow a thorough program. Fungicides are integral to the programs Davis and Albaugh follow, but they employ other control methods.

Albaugh adjusts irrigation as conditions warrant.

"I tend to play it by ear every day and make adjustments accordingly," he points out. "I tend to go with deep and infrequent waterings rather than frequent and shallow. I try to encourage deep rooting on the fairways by drenching them once every four or five days."

Albaugh also tends to be a little cautious with fertilizer. Greens and fairways annually receive 3 lbs. of nitrogen and 6 lbs. potassium per 1,000 sq. ft., while tees get 4.5 lbs. and 8 lbs. of nitrogen and potassium, respectively.

"I try to keep nitrogen levels on the low side and potassium high to give us a healthy turf," Albaugh notes. "If you apply too much fertilizer, you increase your chance of disease."

Cabarrus greens were first built from

hard, native soil.

"We used to aerify at a depth of 18 inches six times a year," Davis reports. "The greens were so hard in some instances that we actually broke tines."

In 1994 and 1995, the club rebuilt every green, bunker (52 total) and 14 tee boxes,

according to original George Cobb plans. The new greens and tees were made from a USGA-approved sand and peat moss blend.

Soil temperatures on the front nine average 10 degrees cooler year-round than on the back half. Fourteen inches below the soil's surface lies a solid granite layer which keeps the soil cool. The cooler temperatures provide a yearly challenge to bermudagrass growth and development, making it more susceptible to disease, Davis says.

It is perhaps not surprising that Davis follows a strict preventive schedule with his fungicides.

"We start in April by applying a good broad spectrum systemic fungicide like Eagle," Davis notes. "Then in May we move to a 7- to 12-day schedule. I never stretch it to 14 days. I tried that about three years ago, and that will be the last time. Pythium almost got the best of us."

Davis' major disease concerns, other than pythium, are dollar spot, fusarium root rot, snow mold and brown patch. Brown patch tops Davis' list. "About 70 percent of the fungicides we spray are labeled for brown patch," he comments.

Besides Eagle, which is manufactured by Rohm & Haas, Davis also uses Chipco 26019, Daconil, and combinations of Subdue and Koban, and Aliette and Fore.

cont. on page 20G



Davis: Greens were breaking tines.



Albaugh: Keeps N high, K low.

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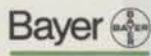
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Circle No. 103 on Reader Inquiry Card



▲ **Larry Schlippert:**
Keep accessories clean
and dry for golfers.

Cultural work makes fairways greens-like

by DEBBIE CLAYTON

Managing fairways that look and play like greens is a challenge Larry Schlippert faces and meets on a daily basis as superintendent at Commonwealth National Golf Club in Horscham, Pa.

Schlippert aerifies fairways anytime from the first week of September to the last week of October, working around outings and special events. He uses a water-cooled Cushman, run in first gear at a low-range idle. He keeps a 1½- to 2-inch pattern, bringing up so many cores that you can hardly see the grass afterward. After the cores dry, he goes over them with a Brouwer five-gang verticutter with the drive gears turning in reverse so the blades are spinning backward.

"We keep going over it until the ¾-inch plugs are pulverized," Schlippert says. "Then we drag fairways three or four times with a section of 12-foot cyclone fencing mounted on a two-inch pipe. After dragging, the remaining debris is blown off the fairways into piles and picked up to limit any bentgrass contamination in the rough.

"If fairways are damaged by the verticutter, we'll topdress them with a seed/soil mixture. We then fertilize with a high N-source fertilizer, water it in and don't mow until the turf has grown well above the soil deposited on top to minimize pick-up."

Commonwealth was designed by Arnold Palmer, and is ranked third in the Philadelphia area (behind Pine Valley and Merion, two of the top-ranked courses in the U.S.).

"Palmer tried to keep the course as maintenance-free as possible without ruining course amenities," notes Schlippert, who joined Commonwealth during construction in 1988. "He incorporated many of the natural features on the property, such as wetlands, ponds and tall oak stands. But he also moved huge amounts of soil to create contour and drainage. Most of the mounding is in the roughs and outer areas, though some holes are severely mounded to distinguish them from the office buildings that are part of the golf course. Greens have only subtle undulation with no severe breaks or mounding."

Relatively flat greens mean more usable space for pin placement and easier maintenance. Whereas greens are 100 percent Penncross bentgrass, fairways, tees and approaches have a combination of Emerald and Penneagle bent. Schlippert cuts greens at ⅜-inch, other bentgrass areas at ⅝-inch, and the bluegrass/rye/fescue roughs between 2 and 4 inches. The course has relatively few trees in some areas, so the deep rough makes a good penalty and helps keep weeds to a minimum. Deep roughs also reduce soil temperatures and water needs.

A single spring pre-emergence applica-

tion of Dimension is Schlippert's entire fairway herbicide program. "I'm leery of skipping our crabgrass control because we aerify fairways so aggressively each fall," he explains. "We bring up so much soil that it's bound to contain crabgrass seed. Bentgrass tends to be thatchy and matty, so if we don't aerify aggressively, we'll have thatch build up like crazy. As it is, we only have ¼- to ⅜-inch of thatch on fairways seven years after establishment."

Aggressive on Poa

Schlippert is a strong advocate of plant growth regulators (PGRs). For the last several years, he's used Cutless plant growth regulator at the rate of 1½ lbs./acre four times each year to reduce *Poa annua* infestations, enhance turf color and reduce mowing. To encourage the bentgrass to fill in where Cutless weakens poa, Schlippert fertilizes 10 days before he applies the PGR, so that the products work together.

► **Schlippert aerifies fairways anytime from the first week of September to the last week of October.**





Continuous cart paths along the fairways at Commonwealth reduce turf traffic pressure.

He broadcasts granular high-content nitrogen fertilizer at the rate of 6 to 8 lbs. per year, split among four applications between May and October. Since bentgrass is most aggressive during summer months when heat and humidity are high, he intensifies this program in June, July and August.

"The PGRs stimulate lateral turf growth while inhibiting upright growth," he observes. "The benefits are reduced mowing and reduced clippings. At times, we could mow just once a week, but always mow Mondays and Fridays to keep up appearances. We have been catching clippings on fairways every cut since the course opened in June, 1990. The PGRs also create a denser turf canopy which helps reduce weed infestations. PGRs do not reduce or eliminate poa seedhead formation, but their application will retain the seeds much longer and actually extend the seed formation process. This year, I switched to Scott's TGR because it's much harsher on the poa than Cutless. Most people have so much poa they can't afford to hurt it, but my fairways range from 85 to 95 percent bentgrass and I don't want any more poa than I already have."

The downside to using PGRs is that dis-

ease symptoms last longer because turf takes longer to recover. In fact, any outside influences on the turf will last much longer, such as heat stress, insect damage, divots and ballmarks.

"When you make your first application," says Schlippert, "how frequently you apply and what rates you use depend on the weather."

Once disease symptoms appear, Schlippert rotates a variety of fungicide products. Daconil, Chipco 26019 and Banner are his main defenses against brown patch. Subdue, Aliette and Banol are used to control pythium. And it helps to know the trouble spots.

"For example, we apply an insecticide for white grubs and black turfgrass aeteniis on greens and tees each year, based on weather conditions," Schlippert says. "I can look at past years' records and almost guarantee you those applications are no more than five or 10 days apart each year. Having a superintendent and crew on board for a long period actually saves a club money over the long run."

Water management plays a key role in Schlippert's disease management program. He hand-syringes fairways during mid-summer, monitoring hot spots and watering accordingly, using Surfside wetting agent in pellet form to aid his hand-water-

Common problem, new solution

With 13 lakes and ponds, Commonwealth is a "magnet" for geese and waterfowl. But last year Schlippert reduced their numbers by staking fishing line along the contours of the ponds about 18 inches from shore. He left the metal stakes about 14 inches above the water and 20 to 30 feet apart. Two strands of 50-pound monofilament fishing line were stretched between the stakes at 9 and 13 inches above the water. Geese like to land in the water and walk out to shore. The fencing prevents them from getting their feet on the ground, and many left the property.

ing efforts. His Toro 8000 irrigation system gives him the flexibility to adjust his watering schedule according to conditions noted during his daily rounds.

No happy 'medium'

Because the golf course was built on swampy land which had to be filled in during construction, most of it lays over an eight-inch clay base, making water management even more essential.

"There's no happy medium with our soils," says Schlippert. "When it's wet, the soil is like muck, but it's like a brick when it's dry. I insisted on continuous cart paths during construction, and that takes care of a lot of the traffic pressure." □

—The author is a frequent contributor to *LANDSCAPE MANAGEMENT*.



Brandon Koehnke oversees one full-time worker, four seasonal full-timers and 11 part-time seasonal workers.

Jacobs Field turf is 18 feet below street level, which helps keep turf temperatures in the mid-40s from March on.



A groundsman's dilemma: Waiting for 'normal'

Brandon Koehnke, manager of field maintenance at Jacobs Field, anticipates a time when his working conditions become more predictable, even if for one season. Lately, his eye has been on the weather map more than the ball diamond.

"The first year I was here, 1992, there was a lot of snow," Koehnke recalls. "Then we had a warm January and February of '93. Last year it was heat."

In between it all was the baseball strike of 1994.

The ups and downs of irritable weather patterns would be harder to take at an older ballpark, but at the three-year-old home of the Cleveland Indians, it's like a kid taking an aspirin in applesauce. The shiny newness of the structure and deep green of the field serve to energize the will to "hang on, summer's almost here!"

Koehnke has been with the Indians through four seasons as of June 1 of this year. Before he took the job he was stadium manager in Homestead, Fla., former site of the Indians training camp.

This spring's weather, he says, was "different, but

bad." Rain and cold made it tough to get turf primed for heavy play.

Seventy-two irrigation heads are scattered around Jacobs Field, which Koehnke says "drains like a sieve, at a rate of 25 inches of water per hour.

"The infield clay is what makes this field the best in the league," asserts Koehnke. "The mix is 75 percent sand, 25 percent clay, with five tons of Turface calcined clay used on the infield to absorb water."

The field at Jacobs played beautifully for the past two years, but was resodded after the 1995 World Series. It was determined earlier in the season that creeping bentgrass was somehow mixed in with the bluegrass sod.

Below-ground, the field follows USGA greens specs. The all-bluegrass turf is supported by an 80/20 sand/peat mix.

As an added turf manager's perk, the bullpen serves as a sod nursery. Sod is sometimes needed around the pitcher's mound, which receives plenty of wear.

Breaks and headaches

"When the team is in town, we mow everyday," says Koehnke.

"When the team is away, we mow

every two or three days and verticut the field."

Regular verticutting eliminates turf grain, so the ball has a truer bounce.

"We core aerify two times, in spring and fall," says Koehnke. "We use half-inch tines that go three to four inches deep."

As if the weather weren't enough to challenge one's skill and patience, Koehnke says the odd problem has also cropped up here and there. Peanut shells work their way down to the field during pressure spraying of the stands, and glowing embers from home run fireworks often float down and burn a patch in the pretty green outfield.

The upswings help. Such as the fact that insect control on the field has been unnecessary for three years, and disease prevention has been minimal. All that's been needed lately was a minimal application of PCNB for snow mold, and a preventive spray for leaf spot. □

—Terry McIver



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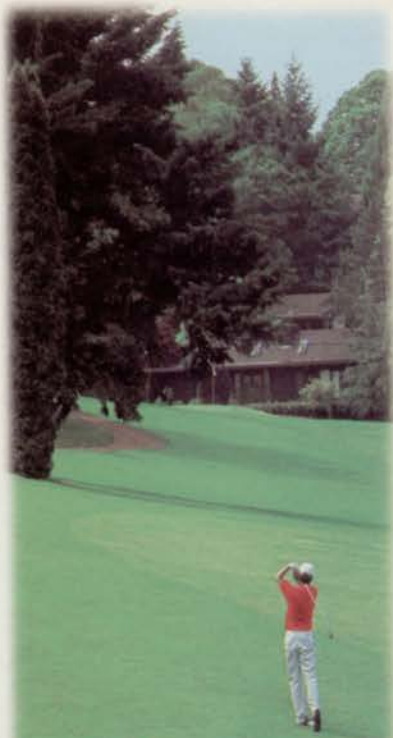
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When bad publicity becomes a memory...

Initiatives being implemented by the GCSAA include a 'partnership' with the EPA and outreach to schools.

The Golf Course Superintendents Association of America foresees a time when bad publicity is just a lingering memory of a by-gone century.

As 2000 approaches, the GCSAA is planning a series of public relations programs to solidify the reputation of golf course superintendents as leaders in environmental stewardship.

The latest image-enhancement measures include three programs announced by outgoing president Gary T. Grigg during the association's annual meeting in February:

- 1) Improve the GCSAA's chapters and its chapter relations;
- 2) Enhance the professional image of the superintendent;
- 3) Solidify the GCSAA's reputation for environment preservation.

"Golf has had its share of negative press, centered on environmental issues," admitted Grigg. "Through our proactive approach, I believe it's time to turn the tide. And I feel that now, for the first time, GCSAA's initiatives this year have included a leadership role in drafting environmental guidelines for golf courses.

"We've also entered into a pesticide environmental stewardship program," reported Grigg. "This program fosters a collaborative—rather than combative—problem-solving relationship between industry groups and pesticide regulators in the EPA, Department of Agriculture and OSHA (Occupational Safety and Health Association)."

GCSAA has given the EPA a pesticide

risk reduction strategy, which Grigg said is a voluntary initiative on the part of GCSAA.

"This strategy," explained Grigg, "includes elements of research, education and communication, to promote the adoption of environmentally-sensitive management practices.

"During a time when budget cuts threaten to strangle the EPA, agency partnerships are increasingly important ways for government-regulated agencies to work together for reasonable goals."

Get children interested

The GCSAA has expanded its Audubon Cooperative Sanctuary Program to include a school division. The ACSP for Schools is designed to help schools enhance their grounds to attract wildlife, conserve resources and provide environmental education and stewardship opportunities for students.

A \$100 annual membership fee helps offset costs of program administration and materials from the Audubon Society of New York State. Included in the program are relevant curriculum, field trips to golf courses and other types of environmental education that meet the needs of each member school.

GCSAA has encouraged its member superintendents to "adopt a local school," by getting in touch with the school principal to explain the program, pass along information, and even make an offer to pay the \$100 fee.

For more information on any of these programs, contact GCSAA at (913) 841-2240. □



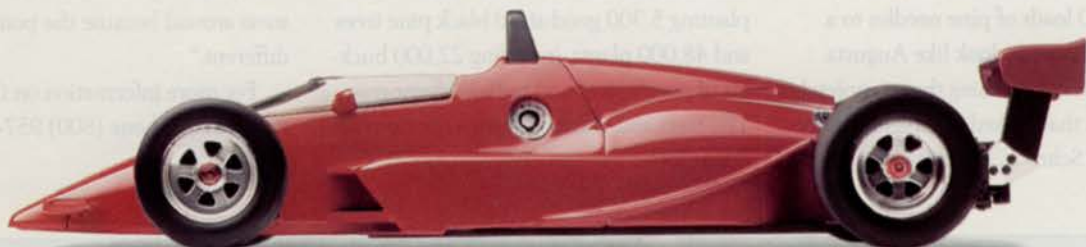
Grigg: GCSAA wants to work with EPA for 'reasonable goals'.

—Terry McIver

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On 'pines' and needles

Raven Golf Club used 46,000 bales of pine straw and planted 5,300 black pines to provide golfers with a different experience in a desert climate.

by LESLEE JAQUETTE

Pine needles are a golfer's friend, not a foe at Raven Golf Club at South Mountain in Phoenix.

They cover the ground, even in wind and rain—at a cost that's in line with the cost of other covers. As an added bonus, golfers can hit off them.

Raven designers David Graham and Gary Panks used 46,000 bales of pine straw over 38 acres of rough and transition areas. At a cost of \$240,000, Corbin's Baled Pine Straw of McDonough, Ga., trucked in 50 loads of pine needles to a course that aspires to look like Augusta.

"We wanted something that completely covered, and that looked completely different," says Ty Schrock, Raven's golf course

superintendent, who notes the new course has already been ranked second in the state.

"We wanted our course to be a bit of the Midwest in the Southwest. The pine trees and pine needles make the difference."

Also, the needles, which come naturally matted together, inhibiting erosion, are basically fire resistant. Because of the region's dry, sometime-searing weather, this is essential. Since the needles are also acidic, they naturally inhibit weed growth.

Along with covering a good part of the course in pine straw, the design called for planting 5,300 good-sized black pine trees and 48,000 plants, including 22,000 buckets of purple deer and buffalo clumpgrass. The trees and grasses enhance the non-desert look.

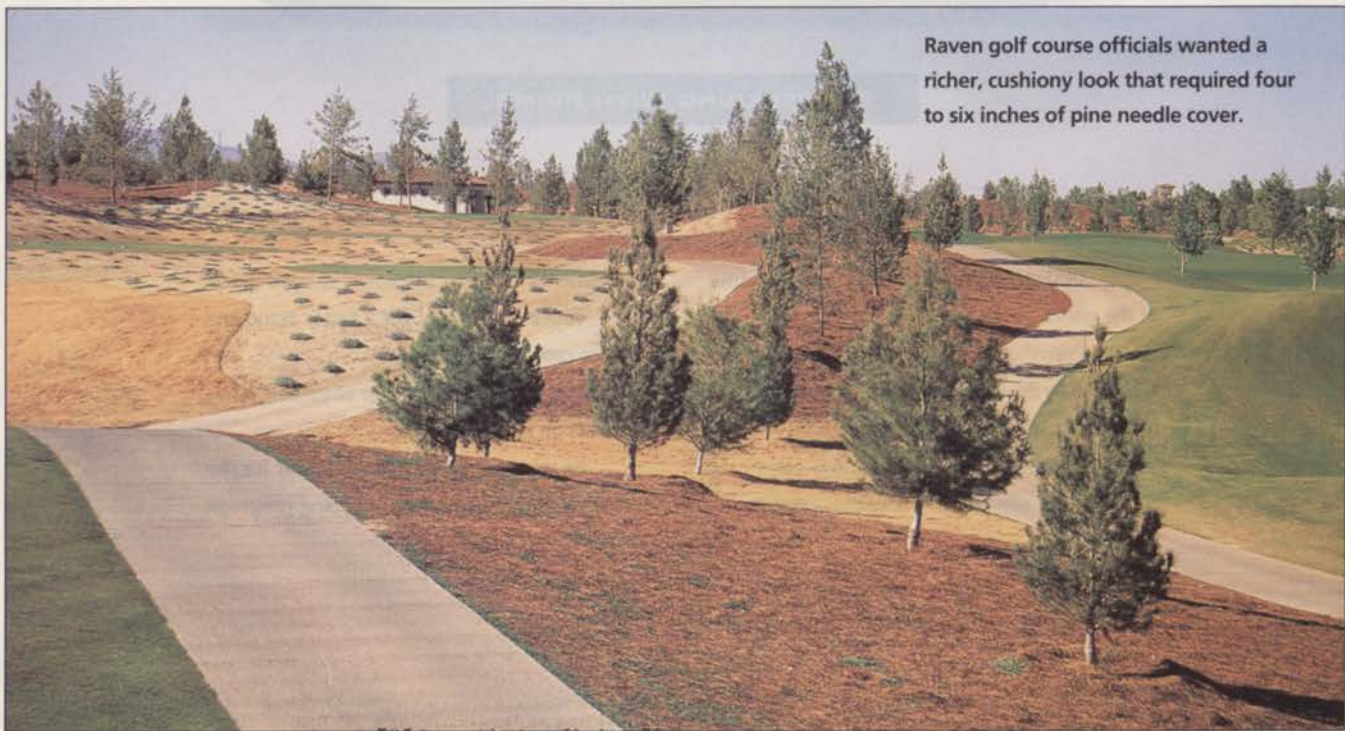
Cost & maintenance

The pine needles cost \$3 per bale when shipped around the Atlanta area, to \$7 per bale when shipped to California. A bale typically covers 50 sq. ft. Corbin's company installs the pine straw for an additional \$1.50 per bale, which Corbin says is a bargain since his staff can spread it more efficiently than persons unfamiliar with the product.

Schrock admits that the needles are difficult to maintain on mounds and in high traffic areas, where it must be raked often. Schrock estimates that 120 man-hours are spent each week raking pine straw. Once the pine trees are more mature and shed more of their own needles, costs will go down substantially.

"The cost isn't the biggest factor in this crazy market," says Schrock, speaking of the Phoenix/Scottsdale area. "We don't mess around because the point is to look different."

For more information on Corbin's Baled Pine Straw, phone (800) 957-1411. □



Raven golf course officials wanted a richer, cushiony look that required four to six inches of pine needle cover.

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Siphons

WORK ON POORLY-SLOPED FAIRWAYS

by LESLEE JAQUETTE

Drainage siphons at Carolina Trace Country Club, Sanford, N.C., have solved a drainage problem caused by inadequate slopes on fairways.

Superintendent Mickey McCord says the siphons are working better than sump pumps for drainage.

A 529-yard long hole is elevated only 30 inches above the level of the 350-acre lake nearby. During the winter and after thunderstorms, the fairway remains soggy and robs golfers of a decent roll.

"There just isn't enough drop over 250 yards to properly drain the fairways," says McCord. "Attempts at conventional subsurface drainage had failed."

McCord's predecessor at Carolina Trace had tried to solve the problem with a sump pump system on the tee side of the fairway. McCord had to correct drainage on the green side. He consulted with Dennis Hurley of Turf Drainage Company of America,

Marrero, La., who suggested breaking up the fairway into smaller drain fields.

"Now, instead of one relief point, we have six for the same area and the subsurface drain pipes have enough slope to do their jobs properly," says McCord.

The six drainage basins are arranged in an "H" shape. Key to the system is the patented one-foot-diameter basins with grates to remove surface water. The walls of the basins are porous, to allow subsurface drainage for the soil profile. A network of "waffle drains" supplied by Turf Drainage extends from each basin.

McCord's staff was able to cut runs from 200 yards to 40 yards, maintaining a better slope. He explains that the basins are connected by polyethylene pipe that ends in a relief cylinder in the lake. A valve connects the irrigation system to the pipe. The success of the system hinges on the fact that other than the initial priming, this valve remains closed.

"The pipe from the basins doesn't have

to be sloped as long as the relief point is below the collection points, water will siphon from the drainage basin." Once the water has been drained, the system is designed to stop draining so water remains in the system and keeps it primed.

The advantages of the siphon system are tremendous, says McCord:

- no valves;
- no moving parts;
- no pumps;
- no electricity;
- no headaches.

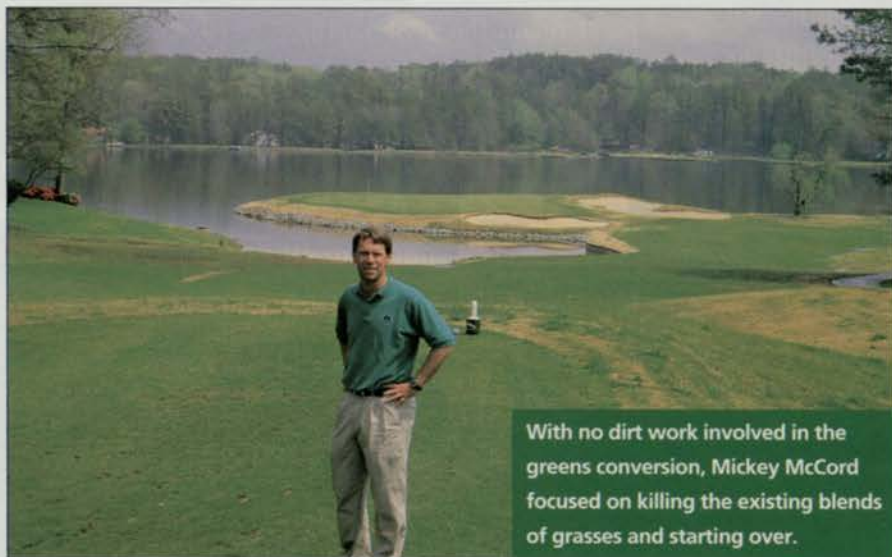
\$2000 per green

Management of Carolina Trace Country Club, Sanford, N.C., recently committed to a four-year renovation schedule of its greens. To that end the club began a greens improvement project, a relatively inexpensive and quick conversion, that cost an average of \$2000 per green. With no dirt work involved, McCord focused on killing the existing blends of grasses and starting over. Starting with the back nine of the Lake Course in August of 1993, the process required:

- 1) three deep-tine aerations;
- 2) then the dirt was scraped down;
- 3) top dressing;
- 4) fumigation;
- 5) verticut again;
- 6) a second topdressing;
- 7) two pounds per 1000 sq. ft. of Dominant creeping bentgrass.

Hand brooming was required, and greens on the back nine were sprayed with fiber mulch. They were watered four to six times per day, and fed with Ringer fertilizer.

One year later, the front nine project was begun. McCord says the same basic plan was followed, only, this time, one ap-





The siphons are one-foot diameter basins with grates to remove surface water.

plication was made of Ringer, followed by two applications per week of fertilizer with minor nutrients. This combination of soluble fertilizer included three ounces per week of Turf Terrific and two ounces per week of Roots biostimulant. The crew sprayed the new greens with this combination every five days for eight weeks, which meant the course opened a month earlier than the back nine.

Members were so impressed with the success, they decided to convert all 18 greens on the Creek course in 1995. At this midway point, McCord says he learned several things. For one, he decided to cut costs further by omitting the mulching with water on this course. It appeared that extra effort to hold the moisture and temperature constant or to keep the seed in place was not necessary.

McCord bought a Terrabroom, which eliminated hours of grooming by hand. McCord estimates the \$2000 broom paid for itself that first year by cutting labor in half on the second eighteen hole course.

McCord went with Crenshaw creeping bentgrass on the second course. After much investigation and discussion with

other superintendents, McCord determined that the Crenshaw would provide a smoother putting surface and better heat tolerance.

It was a horse race on which grass I prefer, but it seems the Crenshaw might afford slightly better heat and stress tolerance," says McCord.

"If a grass offers resistance in summer,

that's when we need the help, and I go for it.

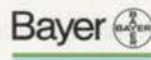
As it turns out, both the Dominant and Crenshaw have proved to be excellent choices for Carolina Trace. The Crenshaw grew so well, says McCord, that 14 greens needed only seven weeks to fully grow in. The remaining four suffered a lag due to shade problems. **LM**

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Circle 104



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TURF & ORNAMENTAL FUNGICIDE

The foundation of good disease management.





Cabarrus greens, bunkers and tees were rebuilt with a sand/peat moss blend. A granite layer 14 inches below the surface keeps the soil cool, which is a challenge to the bermudagrass.

cont. from page 5G

About his fungicide selection, Davis notes, "I like products that give us some longevity. I also like some of the old standards that have been on the market a while, but I keep a close eye on new products because manufacturers keep coming out with good new technologies."

Eagle is one of the new technologies that

Davis decided to try on his course. "We first used it in the fall of '94 for snow mold when it was still an experimental product," he says. "A lower corner on our putting green always seems to give us trouble. We sprayed the Eagle and it did a great job of clearing it up. Plus, we got 15 to 21 days (of control) out of it.

"It fits well into our rotation and into our

budget," Davis notes. "You can rely on the product and know that it's going to control the diseases you are targeting. My spray guys also like the water-soluble packets. They say they're 'worker friendly.'"

Albaugh adheres to a preventive fungicide application schedule to control his main problem diseases: dollar spot, pythium and brown patch.

"Experience has shown me that when you follow a curative schedule, you spend a lot of your time running around playing catch up," Albaugh says.

Albaugh runs a tank mix—combining a contact and a systemic—virtually every time he sprays. He also alternates products with each application to manage against resistance. The products he uses are Eagle, Banner, Bayleton, Sentinel, Vorlan, Curalan, Daconil and Thiram.

"A superintendent can't take complete credit for getting through a summer like last year," says Albaugh. "It takes the total effort of your entire staff." □

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Circle No. 131 on Reader Inquiry Card



Of all the costs associated with turf maintenance, mowing is usually the most costly.

Mowing costs may be cut by using larger mowers. However, that's not always practical. Mowing less frequently will reduce costs, but turf quality will suffer. Less expensive equipment will not last as long.

There is a way to cut costs, reduce the wear and tear on mowing equipment, do a good turn for the environment and raise the turf's quality. It's by using a plant growth regulator (PGR).

GTE Telephone Operations World Headquarters is located on a well-landscaped, meticulously maintained, 112-acre campus in Irving, Texas. To maintain the high quality of the landscape, GTE landscape managers had originally decided to bag clippings and take them to a local composting operation.

However, the GTE staff knew that their best option was to simply leave the clippings on the turf where they would decompose naturally, recycling valuable nutrients and returning organic matter to the soil. The 28 acres of turf consist of

about 75 percent common bermudagrass and 25 percent hybrid bermuda.

"I certainly was skeptical of a PGR's ability to pay for itself," says John Bolte, GTE's landscape coordinator.

During 1994, a 4.5-acre area was selected as a test site for Primo, a PGR formulated by Ciba. Growth declined markedly only five days after the first Primo application; after seven days, the turf was darker green. It was also noticeably thicker, another major benefit of Primo in areas where common and hybrid bermudas grow side-by-side.

"The two varieties are very different, yet in many locations, they're right next to each other," says Bolte. "We've always faced the challenge of trying to match the common and the hybrid. But we've never had them blend so well.

"Our 28 turf acres are also not flat. We saw quite a bit of scalping and gouging before the application. The PGR minimized that problem."

Bolte used Primo on the entire property in 1995. The site was fertilized five times during the season with a 21-7-14 (30% Nutralene) at a rate of 1.5 lbs./N/1000 sq. ft. It was also applied five times during the year: hybrid bermuda received 1 pint/acre and common bermuda received 1 quart/acre. Weekly mowing reports indicated that 16,885 bags of grass clippings—about 2000 cu. yds.—of lawn waste were removed in 1994, but just 2393 bags were removed in 1995, an 86 percent reduction.

"We were able to offer a lower price per cut by using Primo," says Lewis Metheny Jr. of Metheny Commercial Lawn Maintenance. "Our crew was able to mow, edge and detail the property much faster, too."

—Don Wilson is a marketing specialist for Ciba Turf & Ornamental. Dr. Knoop is the technical editor for *LANDSCAPE MANAGEMENT*.

Mowing or PGRs: which saves money?

by DON WILSON and BILL KNOOP, Ph.D.

Making better turfgrass

by TERRY MCIVER / Managing Editor

Improved turfgrass adaptability is one of the research goals at the University of Georgia Experiment Station.

University of Georgia turfgrass scientists could have run a victory lap in Atlanta last month, thanks to the gold medal-quality work at the Georgia Experiment Station.

The station—located in Griffin, about 40 miles from downtown Atlanta—is an active research center for a variety of turf and ornamental experimentation.

Drs. Bob Carrow, Tim Murphy, B.J. Johnson, Ronnie Duncan and others are involved in a variety of research projects. Current goals of two programs are to enhance bermudagrass hardiness and improve insect control in ornamentals.

► “Some of the turfgrass work is showing that in our hot summers, we have bermudagrass that is more suited to those conditions than tall fescue,” says Murphy, agronomist in weed science. Tall fescue,

says Murphy, is the most popular species in northern Georgia, at least for home lawns in the Atlanta metro area.

“It’s a good turfgrass, no doubt about it,” says Murphy. “But summer survival is a problem. Tall fescue is not in the same league as bermudagrass when it comes to summer weed competition. Likewise, bermudagrass can’t compete with winter weeds. It’s not like one grass is ‘better’ than the other, but I think that it depends on the site and expectations.”

Murphy says choosing the turfgrass species and cultivar best suited to the climate has a dramatic influence on weed pressures.

“We’re starting to see research that shows what we’ve been saying for years: an adapted turfgrass will help you. Also, this work is showing that if you take care of that bermuda and maximize its competitive ability through good management and proper use, then it may be possible to back off on your herbicide program.”

Adds professor B. J. Johnson, “There’s no doubt in my mind that under normal conditions, you can reduce your pre-emergence herbicide rates 50 percent or more in the second year.” Johnson has been conducting herbicide efficacy experiments at the station.

► Dr. Ronnie Duncan’s work on seashore paspalum is also gaining notice, as the grass itself becomes a more widely-accepted Southern turfgrass. It has a low cold tolerance, which limits its use and adaptability in the U.S.

“Typically, you see seashore paspalum around Southern ocean areas,” says Murphy.



Shade tolerance experiments may result in better turfgrass cultivars and management practices.

"One reason it came into use in those regions is its high salt tolerance. There hasn't been a lot of breeding work done on it to extend its range, but Ronnie's making good strides.

"There's a lot of other attributes about seashore paspalum that make it very attractive. It's a very low-maintenance turfgrass in terms of its fertility needs."

► Faculty leader Dr. Joyce Latimer leads an ornamental research group. Currently, the team is researching shade tolerance of landscape plants. Its research and education garden for studying specific turf care or ornamental projects is two years old.

"The research garden was designed to look at alternative pest management strategies, and landscape management factors," says Latimer. "It's basically a 10-year project. We look at one landscape management factor—for usually two years—depending on what it is and what complications we run into."

Latimer says the team will examine various landscape components, including turfgrass, annuals, herbaceous perennials and woody ornamentals.

► "One of the major projects is how we can increase the diversity of species used in the landscape and learn how the landscape affects the potential for biological controls," says entomologist Kris Braman.

"Now we have fairly good data on how pests and beneficial predator insects colonize these different areas with the idea being to look at some of the claims that wildflowers promote or enhance the occurrence of beneficial insects and biological

controls."

Braman says shade is having notable effects on reducing the number of two-lined spittlebugs and subsequent damage on host plant material.

► The Georgia Commercial Flower Growers Association has donated \$2000 to build a greenhouse in the garden, which they plan to use for retail horticulture training.

"They see it as a place where they can also hold workshops," explains Latimer. "When they have greenhouse update or greenhouse workshops, there is a place they can actually do things; not just give lectures, but actually hands-on work.

"If a Home Depot store wanted a garden center training program," says Latimer, "the managers would be trained by our extension people, and they would be given the material they need to train their individual employees. If they want to customize the program, they have all that flexibility to customize it. We would facilitate the program by having a location for it, and providing the material they need for it."

According to Latimer, the research garden could also be used for Georgia Green Industry certification.

"The Georgia Green In-



Latimer:
Landscape features influence pest and disease activity.

dustry Association would like a central location where they can collect all of the plant materials that are to be included on the certification exam," says Latimer. "They are looking for a place someone can go to study for the exam, and one place where the exam could be given. They see this as a nice location for the entire state."

► According to Murphy, three Georgia counties—Fayette, Henry and Paulding—are among the fastest growing counties in the U.S.

"If we go 20 miles east or west, it's a very active subdivision building area, with lots of turfgrass, ornamentals, lawn care and landscaping activity,"

says Murphy.

"Traditionally, growth has been on the north side of Atlanta, but they've gone about as far north as they can go. Now, they're running around the edges."

The Olympics has brought lots of green industry activity to the state. The interstates are trimmed with ornamentals planted and maintained by the Georgia Department of Transportation.

Other developments include the turfgrass installation for the Olympic Stadium and the construction of 30 athletic fields for softball demonstrations in Columbus, Ga., about 80 miles west of Atlanta. **LM**



Murphy:
Adaptability to climate reduces turf stress.

Events

AUGUST

15: Michigan Turfgrass Field Day, Michigan State University, East Lansing. Phone: Kay, (517) 321-1660.

15-16: Plant Identification and Hands-On Pruning Workshop, Michigan State University, East Lansing. Phone: Amy Frankmann, (800) 879-6652.

16-18: Tan-Misslark Trade Show, George R. Brown Convention Center, Houston. Phone: (800) 880-0343 or (512) 280-5182.

16-18: "Field Diagnosis of Insects and Diseases on

Trees and Shrubs" seminar, Cornell University, Ithaca, N.Y. Phone: (518) 783-1322.

20-25: AAN Convention and Farwest Show, Oregon Convention Center, Portland. Phone: AAN, (202) 789-2900 or Oregon Assn. of Nurserymen, (503) 653-8733 in Portland or (800) 342-6401 nationwide.

21: University of Illinois Turfgrass, Nursery, Landscape and Trial Garden Field Day, U of I, Urbana. Phone: Tom Voigt, (217) 333-7847.

21-24: ALCA Certified

Landscape Technician test, Portland (Ore.) Community College. Phone: Vicki Buswell, (703) 620-6363.

23-26: Florida Turfgrass Association Annual Conference & Show, Tampa Convention Center. Phone: Stacy Lee Funk, (800) 882-6721.

24: "Turf Insect and Grub IPM," seminar, Rockland County, N.Y. Phone: Anna Perkins, (914) 429-7085.

29: University of California Turf and Landscape Research Field Day, Bay Area Research & Extension Center, Santa Clara. Phone: Dr. Ali Harivandi, (510) 670-5215.

29: IPM Workshop, "Rec-

ognizing and Diagnosing Problems of Turf," University of Massachusetts Eastern Extension Center, Waltham. Phone: Kathleen Carroll, (413) 545-0895.

29: GCSAA seminar, "Microbiology of Turfgrass Soils," Austin, Tex. Phone: (913) 841-2240.

SEPTEMBER

5: GCSAA seminar, "Reclaimed Water Irrigation," Phoenix. Phone: (913) 841-2240.

5-6: Southwest Horticultural Trade Show, Phoenix, Ariz. Phone: (602) 966-1610.

8-10: GrowTech 96 (international hort trade exhibition and conference), Miami Beach (Fla.) Convention Center. Phone: (508) 664-6455.

9-10: South Carolina Turfgrass and Landscape Update, South Carolina Botanical Garden, Clemson. Phone: (864) 656-3403.

13: GCSAA seminar, "Maximizing Turfgrass Disease Control," Galena, Ill. Phone: (913) 841-2240.

14: Festival of Color, John Seaton Anderson Research Facility, Lincoln, Neb. Phone: Amy Greving, (402) 472-2854.

16-18: Virginia Turf and Landscape Field Days, Virginia Tech, Blacksburg. Phone: David Chalmers, (540) 231-9738 or David McKissack, (540) 231-5897.

17-18: Turfgrass and Landscape Field Days, University of California/Riverside. Phone: Susana Denney, (909) 787-4430.

LM

Info center

VIDEOS AND LITERATURE FOR THE GREEN INDUSTRY

ECOLOGICAL LAWN CARE...Paul Sachs' second book is called the "Handbook of Successful Ecological Lawn Care." The book explains the benefits of ecological lawn care, and examines the facets of lawn installation and maintenance to analyze the effect conventional activities have on the soil ecosystem. The book covers soil systems, soil testing, pest control, fertility and business management. To order, contact Edaphic Press, P.O. Box 107 Newbury, VT 05051. Phone: (802) 222-4277.

SOUTHERN WEEDS...437 color photographs of 193 weed species on 298 pages are in "Weeds of Southern Turfgrasses." The book is mostly applicable to the South, but many of the weeds are found across the U.S. The authors are: Tim Murphy, Daniel L. Colvin, Ray Dickens, John W. Everest, David Hall and Lambert B. McCarty. Cost is \$8. Contact: Agricultural Business Office, Room 203, Conner Hall, The University of Georgia, Athens, GA 30602.

IRRIGATION PRODUCTS...Hunter Industries' irrigation products catalog is spiral bound for easy reference to the Hunter product line and helpful irrigation tips. Free from your local Hunter distributor, or call (800) 733-2823 or fax (619) 744-0891.

TREES, BUILDINGS..."Trees and Building Sites," edited by Dr. Dan Neely and Dr. Gary Watson, includes proceedings of an international conference that investigated the scientific basis for managing trees in proximity to buildings. Cost \$40 (\$35 for ISA members), plus \$5 S&H. Contact: International Society of Arboriculture, P.O. Box GG, Savoy, IL 617874. (217) 355-9411; fax: (217) 355-9516.

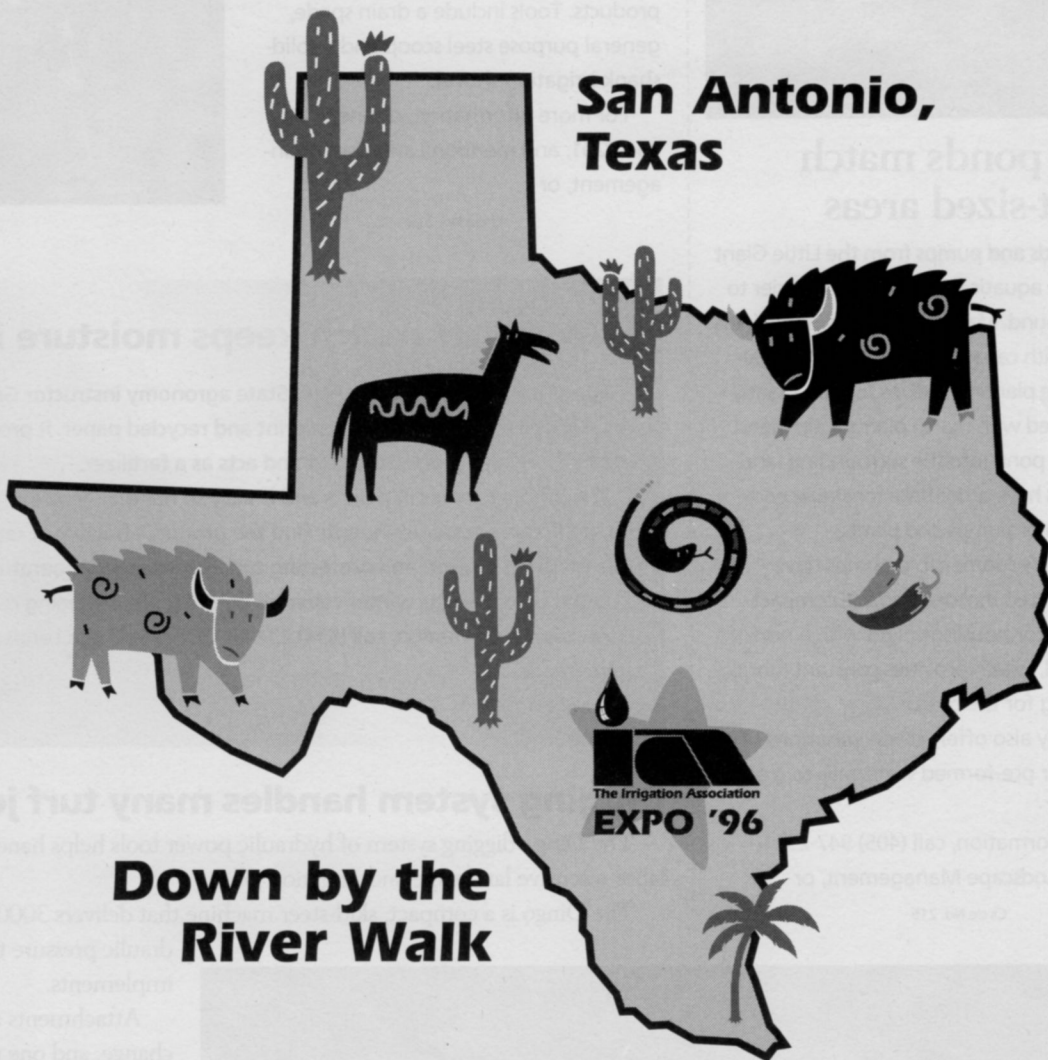
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BOX NUMBER REPLIES: Mail box number replies to: LANDSCAPE MANAGEMENT, Classified Ad Department, LM Box #, 131 W. First St., Duluth, MN 55802. Please include box number in address.

For Advertising Information
Contact Dan Hoke at
216-891-2762

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LANDSCAPER DESIGNER/ESTIMATOR/MANAGER

Well established landscape design/build company seeks highly motivated, well organized self-starter to join our team effort. Individual should have a minimum 2 year degree in Ornamental Horticulture and 2 years experience in the landscape field. Must have ability to schedule and manage planting crews, design, estimate and sell projects. Competitive salary and benefit package. Send pay history and resume to Green Biz Nursery & Landscaping, Inc., Landscape Manager, P.O. Box 64995, Fayetteville, NC 28306.

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SALES

GROUND MAINTENANCE - DESIGN/BUILD

DuBrow's Nurseries, Inc., a progressive, well established northern NJ horticultural enterprise seeks a mature, experienced sales manager. The right individual must have a minimum of 5 yrs. experience in the industry, knowledge of grounds management a must. Horticultural degree a plus. Excellent benefits. If you have the ability to close sales and win the trust and respect of corporate clients, please fax your resume to 201-992-6050, attn.: Michael Branch. EOE M/F.

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DuBrow's Nurseries, Inc., a full service Horticultural corporation, with locations in Northern/Central NJ and Eastern PA, is looking for all levels of management; managers, foremen/women, assistant foremen/women for our growing Grounds Management, Design/Build and Nursery/Growing divisions. Must possess a related college degree, bilingual is a plus. Competitive salary and full company benefits. Please fax resumes to: DuBrow's, attn. Michael Branch, fax: 201-992-6050. EOE M/F.

SALES & MARKETING REP

Successful candidates will be involved in new business development and promotion of landscape management and related site services. Directly responsible for estimating, bidding, and sales. Some travel required. Excellent growth potential and benefits are available for qualified applicants.

Qualified candidates should have a horticultural related degree, and/or strong sales record in the landscape industry. High level of communication, interpersonal, and organizational skills are required.

Please send or fax resume to:
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Stanford, CT 06911-0322
Fax: (203) 316-5434

LANDSCAPE MAINTENANCE SUPERVISOR

Well established landscape & maintenance company seeks individual with 2 year degree in Horticultural or work experience equivalent. Knowledge of pests and diseases, pesticide applicator's license. Must be a well organized self starter, knowledgeable in grounds management practices and have the ability to schedule and motivate several grounds crews on a weekly basis. Competitive salary and benefit package. Send pay history and resume to Green Biz Nursery & Landscaping, Inc., Landscape Maintenance Supervisor, P.O. Box 64995, Fayetteville, NC 28306.

Fastest Growing Company in Southern Florida seeks Management and Supervisory Personnel for Pest Control, Lawn, and Termite Control. Excellent growth potential. Full benefits package. All replies strictly confidential. Send resume to: P.O. Box 7011, West Palm Beach, FL 33405-7011. 12/96

MAINTENANCE SUPERVISORS The Brickman Group, Ltd., one of the nation's largest and fastest growing full service landscape companies, has an immediate need in principal cities east of the Mississippi for maintenance supervisors with 2-5 years experience. Brickman seeks energetic, team oriented college graduates with proven leadership, communication and interpersonal skills. Brickman offers full-time positions, excellent advancement opportunities and exceptional compensation and benefits with an industry leader building on a 56-year tradition of uncompromising customer service. For immediate confidential consideration, please send or fax your resume with an indication of your geographic preferences and willingness to relocate to: The Brickman Group, Ltd., Corporate Office, 375 S. Flowers Mill Road, Langhorne, PA 19047, 215-757-9630, EOE. 8/96

Compost Marketing Manager Lead the development of marketing opportunities for compost made from green waste through recycling partnerships with multiple facilities. Build relationships with plant nurseries, growers, landscape contractors, landscape material suppliers, park and recreation departments, and golf courses to distribute 40,000+ cubic yards of finished compost annually throughout the Southwest. Progressive benefits package and Tucson Arizona corporate location. Send inquiries to Desert Compost, P.O. Box 43820, Tucson, AZ 85733-3820. An EEO employer. 8/96

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November 1996	10/8
December 1996	11/6

(Please call Sales Rep to confirm dates.)

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For more information call: 1-800-225-4569 or 216-891-2762, Fax: 216-826-2865.

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Wanted: Professional/Commercial Landscape Maintenance Company in NM, TX, UT, & CO. Minimum sales \$500,000 annually. Employment agreement & benefits negotiable. Please write: Acquisitions Dept., P.O. Box 43668, Tucson, AZ 85733-3668. 8/96

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Grab Bag

The 1995 drought: bad in California

"Although the [1995] drought didn't cause many project cancellations, there were cutbacks and delays with water-oriented features such as man-made lakes and streams, waterfalls, fountains and other special effects.

"In addition, projects which required extensive irrigation were scaled back or deleted. These included parks, green belts and other landscapes requiring large expanses of turfgrass."



—MICKEY STRAUSS, PRESIDENT, CLIC



Just hangin' out It might not be the safest job in the world, but it can't be beaten for high visibility, as this employee of LaFlamme Services learns from his experience at GTE's world headquarters in Stamford, Conn. "Unusual" is the perfect word for this maintenance job, which entails hanging out over I-95 to trim deep shrubs and taking mowers up a tiny freight elevator. Nevertheless, LaFlamme won a 1994 Merit Award in the Associated Landscape Contractors of America annual contest.

Bugzappers out of control!

An entomologist from the University of Delaware says electric "bug zappers" are killing a high number of ben-

eficial insects, and very few mosquitoes. Over the summer of 1994, Dr. Doug Tallamy and assistant Tim Frick collected

and identified the kill from zappers at six sites in suburban Newark. Only 31 of the 14,000 electrocuted insects were biting flies; almost half were aquatic insects, caddisflies and midges. Most species of mosquitoes are not attracted to black lights, says Tallamy, and certain mosquitoes bite only during the day.

A groundsman's dilemma

'I feel sort of like the superintendent at the local country club. Except that he's got to worry about 200 millionaires, and I've only got to worry about 25. And the only time we hear from them is when they have a complaint.'



—BRANDON KOEHNKE, GROUNDSKEEPER FOR THE CLEVELAND INDIANS AND JACOBS FIELD

Grab Bag is a new LM department that features brief observations and prognostications throughout the green industry. If you have an unusual photo or comment you'd like to share with us, please send it in...

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| 02 <input type="checkbox"/> 10 Sport Complexes | 09 <input type="checkbox"/> 45 Condominiums/Apartments/Housing Developments/Hotels/Resorts |
| 03 <input type="checkbox"/> 15 Parks | 10 <input type="checkbox"/> 50 Cemeteries/Memorial Gardens |
| 04 <input type="checkbox"/> 20 Rights-Of-Way, Maintenance for
Highways/Railroads & Utilities | 11 <input type="checkbox"/> 55 Hospital/Health Care Institutions |
| 05 <input type="checkbox"/> 25 Schools, Colleges & Universities | 12 <input type="checkbox"/> 60 Military Installations & Prisons |
| 06 <input type="checkbox"/> 30 Industrial & Office Parks/Plants | 13 <input type="checkbox"/> 65 Airports |
| 07 <input type="checkbox"/> 35 Shopping Centers, Plazas & Malls | 14 <input type="checkbox"/> 70 Multiple Government/Municipal Facilities |
| | 15 <input type="checkbox"/> Other (please specify) _____ |

B. CONTRACTORS/SERVICE COMPANIES/CONSULTANTS:

- | | |
|--|---|
| 16 <input type="checkbox"/> 105 Landscape Contractors (Installation & Maintenance) | 20 <input type="checkbox"/> 125 Landscape Architects |
| 17 <input type="checkbox"/> 110 Lawn Care Service Companies | 21 <input type="checkbox"/> 130 Land Reclamation & Erosion Control |
| 18 <input type="checkbox"/> 112 Custom Chemical Applicators (Ground & Air) | 22 <input type="checkbox"/> 135 Extension Agents/Consultants for Horticulture |
| 19 <input type="checkbox"/> 120 Tree Service Companies/Arborists | 23 <input type="checkbox"/> 140 Irrigation Contractors |
| | 24 <input type="checkbox"/> Other Contractor or Service _____ |

C. SUPPLIERS:

- 25 210 Sod Growers, Turf Seed Growers & Nurseries
26 215 Dealers, Distributors, Formulators & Brokers
27 220 Manufacturers

2. WHICH OF THE FOLLOWING BEST DESCRIBES YOUR TITLE? (check ONE only)

- 28 10 EXECUTIVE/ADMINISTRATOR: President, Owner, Partner, Director, General Manager, Chairman of the Board,
Purchasing Agent, Director of Physical Plant
29 20 MANAGER/SUPERINTENDENT: Arborist, Architect, Landscape/Ground Manager, Superintendent, Foreman, Supervisor
30 30 GOVERNMENT OFFICIAL: Government Commissioner, Agent, Other Government Official
31 40 SPECIALIST: Forester, Consultant, Agronomist, Pilot, Instructor, Researcher, Horticulturist, Certified Specialist
32 50 OTHER TITLED AND NON-TITLED PERSONNEL: (please specify) _____

3. SERVICES PERFORMED: (check ALL that apply)

- | | |
|--|---|
| 33 <input type="checkbox"/> A Mowing | 41 <input type="checkbox"/> I Landscape/Golf Design |
| 34 <input type="checkbox"/> B Turf Insect Control | 42 <input type="checkbox"/> J Turf Weed Control |
| 35 <input type="checkbox"/> C Tree Care | 43 <input type="checkbox"/> K Paving, Deck & Patio Installation |
| 36 <input type="checkbox"/> D Turf Aeration | 44 <input type="checkbox"/> L Pond/Lake Care |
| 37 <input type="checkbox"/> E Irrigation Services | 45 <input type="checkbox"/> M Landscape Installation |
| 38 <input type="checkbox"/> F Turf Fertilization | 46 <input type="checkbox"/> N Snow Removal |
| 39 <input type="checkbox"/> G Turf Disease Control | 47 <input type="checkbox"/> O Other (please specify) _____ |
| 40 <input type="checkbox"/> H Ornamental Care | |

4. WHAT IS YOUR ANNUAL BUDGET FOR EQUIPMENT,
CHEMICALS, SUPPLIES? (please check one)

- 48 1 Less than \$50,000 51 4 \$250,001-500,000
49 2 \$50,000-\$100,000 52 5 More than \$500,000
50 3 \$100,001-\$250,000

101	119	137	155	173	191	209	227	245	263	281	299
102	120	138	156	174	192	210	228	246	264	282	300
103	121	139	157	175	193	211	229	247	265	283	301
104	122	140	158	176	194	212	230	248	266	284	302
105	123	141	159	177	195	213	231	249	267	285	303
106	124	142	160	178	196	214	232	250	268	286	304
107	125	143	161	179	197	215	233	251	269	287	305
108	126	144	162	180	198	216	234	252	270	288	306
109	127	145	163	181	199	217	235	253	271	289	307
110	128	146	164	182	200	218	236	254	272	290	308
111	129	147	165	183	201	219	237	255	273	291	309
112	130	148	166	184	202	220	238	256	274	292	310
113	131	149	167	185	203	221	239	257	275	293	311
114	132	150	168	186	204	222	240	258	276	294	312
115	133	151	169	187	205	223	241	259	277	295	313
116	134	152	170	188	206	224	242	260	278	296	314
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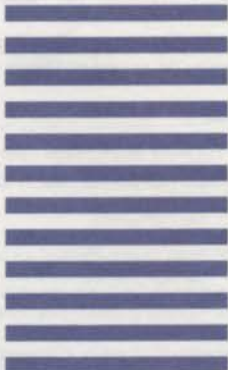
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49 2 \$50,000-\$100,000 52 5 More than \$500,000
50 3 \$100,001-\$250,000

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

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'Penn Pals'
at the
1996 PGA
Championship

Eighteenth hole, Valhalla Golf Club, Louisville, Kentucky

Pennncross and PennWay are Part of the Picture at the 1996 PGA

"We have always maintained high standards at Valhalla. Pennncross creeping bentgrass greens and PennWay blend fairways and tees are some of the perks our members enjoy. Touring pros also expect the best fairways and greens, and our bents will accommodate them.

Turf preparation began in fall prior to this golf season. Our plan was to have the

turfgrass healthy and ready the fall before the tournament, so we encouraged growth with an aggressive renovation and fertilization program before our cold temperatures came.

The PGA is August 5-11, typically a difficult time of year for cool-season grasses. Louisville is past the extreme edge of bentgrass adaptation. You'll find more bermuda- and zoysiagrass fairways around here, but the Penn bents perform like warm season grasses for us when it's really hot. The bents are especially aggressive and repair ballmarks, spikemarks, and divots quickly. We do take extra care to keep them from overtaking bunker faces and encroaching on our roughs. As far as disease pressure and turf vitality,

the Penn bents have been a good choice. We grow ryegrass, Kentucky bluegrass, fine and tall fescues in the roughs.

Valhalla opened in 1986. I've been here since 1988 and have experienced very little *Poa annua* even though it's a problem in the area. A good maintenance program and aggressive bents seem to control it, but we are seeing more signs of the persistent nuisance.

Our greens are mowed at 1/8" all year. I don't change the height of cut, but I will change from a grooved to solid roller in the summer. For the PGA, I want the greens to be 'the Beast'. I want to take them to the edge. To go along with the Jack Nicklaus course design, the greens need to test the best players

in the world. More so than the roughs or anything else.

I'm proud to be a part of the PGA Championship here at Valhalla. Preparation for a Major is much simpler with a spectacular course, great people, and exceptional turfgrasses."



Mark Wilson, CGCS, Supt.
Valhalla Golf Club
Louisville, KY

Call or fax today for a FREE copy of
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the Penn Pals dealer nearest you.



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