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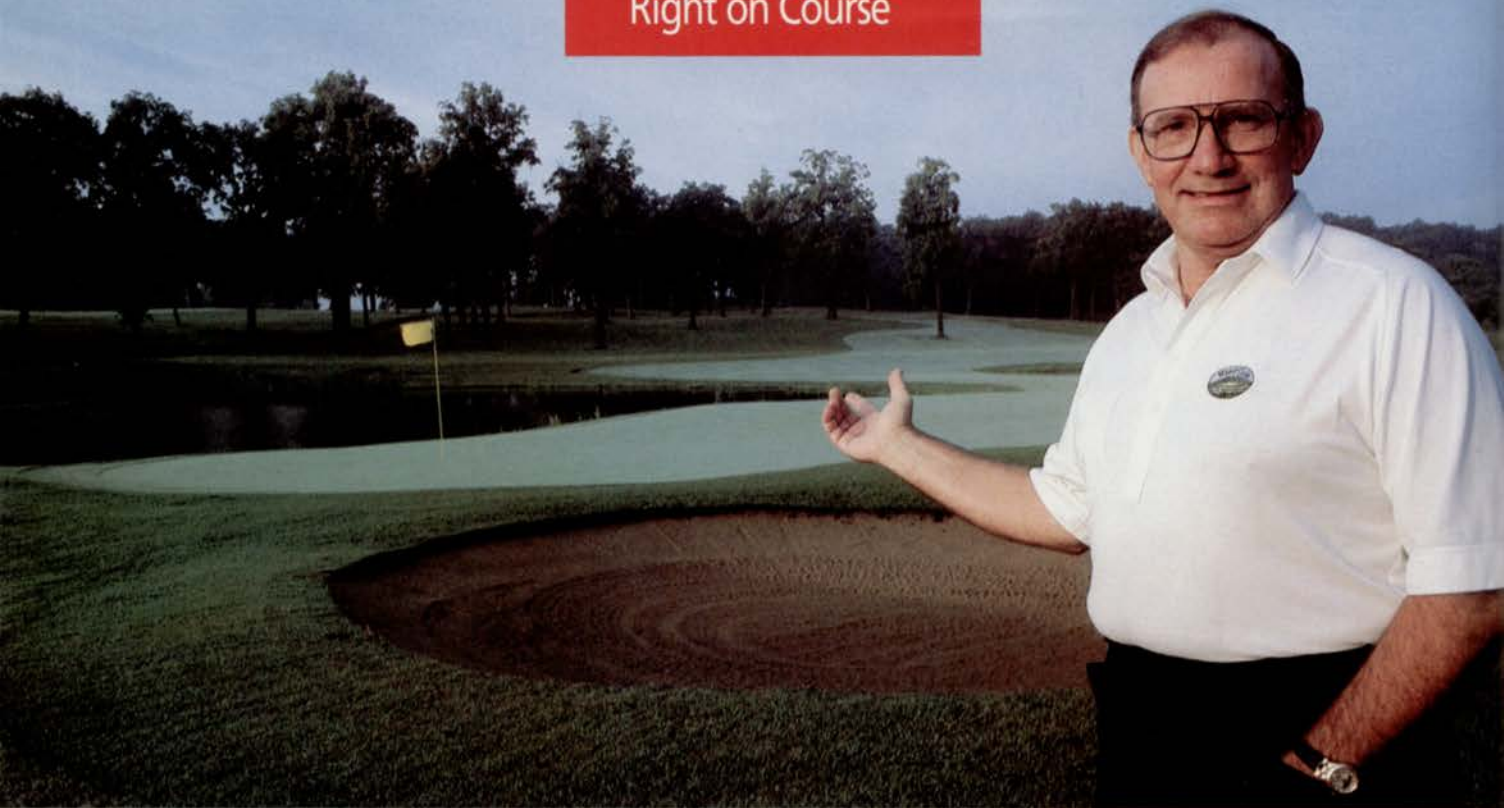
*LM Reports on
biostimulants*

*Defining your
training philosophy*

*Standardized
sign-posting?*

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The Penn Pals:
Right on Course



Oscar Miles, CGCS, overlooks the 6th hole at the Merit Club, Libertyville, Illinois.

PennLinks Greens. Penneagle Fairways. Penncross Tees. The 'Penn Pals' Are Picture Perfect At The Merit Club.

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AS WE SEE IT

JERRY ROCHE, EDITOR-IN-CHIEF



One thing is for certain: changes are constant here

MANY OF YOU who have begun cus-
tomizing your agronomic programs—by
fairway or by customer—will find
LANDSCAPE MANAGEMENT's latest innovation
easy to understand.

You might have noticed a subtle
change in last month's issue, one that's
even more evident this month:

Henceforth, if you're a lawn or land-
scape contractor, you'll receive an expanded
"Lawn & Landscape Industry" (formerly
"Lawn Care Industry") section with each
new issue. If you're a golf course superin-
tendent or athletic field supervisor, you'll
receive an expanded "Golf & Athletic Turf"
(formerly "Golf 'Scaping") section.

Each of these sections is designed for,
and written to, its specific audiences. Lawn
and landscape contractors no longer have
to shuffle through stories about killing
Poa annua on fairways, and superinten-
dents won't have to worry about reading
articles on getting loans from banks.

We've "personalized" the magazine to
your particular tastes. We'll be printing
two editions (they're called "demograph-
ics" in the magazine business) each
month, only one of which you'll receive in
the mail. But your personalized edition
will be more targeted to your type of oper-
ation—not only in the articles we provide,
but also in the advertisements.

The largest portion of the magazine,
however, will remain the same. Every
month, you'll still be able to read "LM
Reports," Dr. Bal Rao's popular "Ask the
Expert" column, "Hot Topics" and "Pro-
duct Showcase." And you'll still see the
best of the university researchers writing
in our "Tech Center" section each month.

It's been a little more than seven years
since we changed our name from *Needs
Trees & Turf*. It's been exactly three years
since we changed our format (shorter arti-
cles, more charts and graphs) to better
suit your needs. Just 10 months ago, we
unveiled our new-look cover with the

snappy green border to separate us from
all those other nameless magazines you
receive in the mail every month.

With this newest, bold step toward
highly-defined "demographic" editions, we
feel we're continuing to fine-tune the
magazine. We think you'll like the
changes.

ON ANOTHER NOTE: You can watch
for a series of definitive articles on the
"State of the Green Industry" (last pub-
lished in 1991) in upcoming months.

Last month we mailed questionnaires
to 1,000 lawn care operators across the
country to help us prepare for our annual
"State of the Lawn Care Industry" report,
which will appear next month.

And this year, it'll also be the kick-off
to three other such reports.

Our December issue will feature a
"State of the Industry" report on **athletic
field maintenance**. Our January issue will
deal with the **landscape maintenance** por-
tion of the industry. And, finally, our
mammoth February issue will contain a
"State of the Golf Maintenance Industry"
report.

We'll be mailing out 3,000 short ques-
tionnaires to readers in the next few
months. If you receive one, we ask you to
take five minutes to fill it out and prompt-
ly return it to us.

As always, your cooperation on these
important projects can only help make a
great magazine even better! Thanks!

LANDSCAPE MANAGEMENT

"WE KNOW YOUR TURF"

OCTOBER 1994 VOL. 33, NO. 10

COVER FEATURE

6 Readers rate the mowers

What's most important to you? Quality? Price? Serviceability? Here's what landscapers and superintendents think of today's mowing equipment.

FEATURES

8 LM Reports: Biostimulants

A decade ago, turfgrass professionals scoffed at the idea of spraying something like processed seaweed extract on turfgrass. They're listening now. They're also buying so-called plant biostimulants in record amounts.

Ron Hall

10 Planting bulbs

Now is the time to plant flower bulbs for a colorful effect on the landscape come next spring. Here are some helpful hints.

Jerry Roche

14 Training is more than books

For an effective employee training program, you have to envision it, believe in it, and have a definitive philosophy.

John B. Calsin, Jr.



16 EPA eyes standard posting

The national regulating agency recommends posting for LCOs, parks, golf courses and homeowners, and doesn't rule out federal posting law.

Ron Hall

GOLF & ATHLETIC TURF

25 Course maintenance trends

A survey conducted at the GCSAA show tells us that PGRs and increased color are two of the trends taking hold at the nation's golf courses. Further research supports it.

Jerry Roche

27 Overseeing new construction

It's never easy, but conscientious golf course superintendents like Tim Smith at Hawk's Nest are involved from the start.

Jerry Roche

30 Non-monetary motivation

Finding ways to motivate your maintenance staff is no easy task. The work can be tedious and monotonous, even at the best of times.

Sam Crowe, Craig Conner

32 Budgeting priorities

Making out a 'wish list' of athletic field projects—even at the University of Notre Dame—is never an easy proposition, as the facilities manager and athletic department business manager concur.

Dale Getz, Bubba Cunningham

TECH CENTER

33 Winterizing landscapes

Last winter, "the record-breaking temperatures, deep snow and ice storms took their toll on almost everyone's landscape," says Dr. J. Robert Nuss. Can you prevent the same thing from happening this year?

Terry McIver



34 Take-all patch springs up

A disease that appears to be either brown patch or grub damage, but upon closer inspection is not.

James E. Guyette

HOT TOPICS

37 GIE: Meet me in St. Looie

The fifth annual Green Industry Expo and its attendant national conventions (PLCAA, ALCA, PGMS) are shaping up quite nicely, thank you. Here is a look at the line-up for attendees, including the keynote speech by former Pittsburgh Steeler Rocky Bleier.

38 Electing new leaders

Dale Amstutz becomes the 15th president of PLCAA, while Steven W. Chapman, CGM, takes over as president of PGMS next month at the annual meetings of the two organizations.

Ron Hall

DEPARTMENTS

- | | |
|--------------------------|---------------------------|
| 1 As We See It... | 42 Jobtalk |
| 4 Ask the Expert | 43 Product Review |
| 40 Info-Center | 46 Market Showcase |
| 40 Events | 47 Classified |
| 41 U Said It | 48 Ad Index |

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ASK THE EXPERT

DR. BALAKRISHNA RAO



Azalea troubleshoot

What would cause azaleas that have been in the ground for several years to begin to look bad? (Pennsylvania)

Solution: In your part of the country, azaleas can develop a number of problems: mites, lacebugs, phytophthora root rot and iron deficiency chlorosis.

They are also sensitive to extremes in moisture and/or temperature. Consider the possibility of exposure to drought since 1988. Also, last year's winter sub-zero temperatures affected a number of shrubs, including azalea.

Stress will weaken the plants and make them vulnerable to a number of pest problems. If the soil pH is high (alkaline), micronutrients—particularly iron—will be tied up in soil and will be deficient in leaves, resulting in chlorosis.

Apply mite and lacebug control as needed. If you are considering using Dursban, use Dursban WP instead of the EC formulation. Azaleas are phytotoxic to the EC formulation. For root rot disease management, consider using fungicides such as Subdue or Aliette.

- For micronutrient disorder, have the leaves and soil tested to determine the deficient element. Then provide the corrective treatment as needed.

- Drought or low temperature injuries are difficult to diagnose, particularly if considerable time has elapsed since the injury occurred. However, clues such as the time the symptoms appeared, plant exposure, whether or not the damage is confined to specific plants or species, and whether or not there is a clear time of demarcation between damaged and undamaged tissues help establish the cause.

Will Epsom salts cure chlorosis?

One of our customers asked whether Epsom salts can be used to correct chlorosis in maple trees. What is your opinion? (Michigan)

Solution: Yes—if the chlorosis is caused by a magnesium deficiency. Epsom salts contain magnesium sulfate. They are recommended for trees having chlorosis problems caused by low magnesium levels.

Generally, if the pH needs to be increased, an application of dolomitic limestone, which contains magnesium carbonate and calcium carbonate, is recommended.

Soil in your area may have a naturally high pH. If so, an application of dolomitic limestone is *not advisable*.

Under high pH alkaline soil conditions, micronutrients such as manganese and/or iron would tie up in soil, even if they are present in sufficient amounts. Generally, in the Northeast, manganese is the primary deficient element in maple chlorosis disorder. I believe someone might have mistaken magnesium for manganese and suggested Epsom salts.

The best thing to do is to have a foliar and soil nutrient analysis. Correct the problem according to test results.

Curing dieback on Bolleana poplar

A large number of Bolleana poplar trees are showing extensive dieback and decline. We were told that these trees are supposed to be resistant to cankers. However, we see a large number of cankers. How can we treat these problems? (Tennessee)

Solution: The Bolleana poplar (*Populus alba* 'Pyramidalis') has often been used to replace the less hardy Lombardy poplar. Its narrow, upright form makes it a popular screening tree.

However, it is relatively short-lived and is subject to canker diseases. It also produces a lot of suckers, especially when a live tree is cut down. It is very fast growing.

The fungal organisms which cause cankers establish on stressed, weakened trees. The past several years' drought has adversely affected a number of trees. Maturing poplar plants, when exposed to extremes in moisture and/or temperature stress, will be susceptible to canker diseases.

Poplar plants are susceptible to several fungal canker diseases such as cytospora canker (*Cytospora chrysosperma*); poplar canker (*Cryptodiaphorthe populea*); imperfect stage (*Dothichiza populea*); fusarium canker (*Fusarium solani*); or hypoxylon canker (*Hypoxylon pruinaum*). To further identify causal agents, a laboratory diagnosis is needed.

Canker diseases are difficult to manage. There are no fungicides registered to manage this problem. Remove and destroy severely diseased plants. Selectively prune diseased plant parts, water, mulch, fertilize and provide pest management as needed to improve plant health and vitality.

Necrotic ring spot

Problem: What fungicides can be used to manage necrotic ring spot, and when is the best time to treat it? (Canada)

Solution: For necrotic ring spot disease on turfgrass, reports indicate that fungicides such as Banner, Rubigan or Tersan 1991 should be used.

Check with your Ministry of Environment about the availability of Banner and Rubigan in Canada. Also check your Tersan 1991 label to see whether the product can be used for necrotic ring spot in your area.

Follow good cultural practices such as proper mowing, watering, fertilizing and aerifying to improve turfgrass health.

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

Mail questions to "Ask the Expert," LANDSCAPE MANAGEMENT, 7500 Old Oak Blvd., Cleveland, OH 44130. Please allow two to three months for an answer to appear in the magazine.

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The Gateway Arch in St. Louis commemorates America's westward expansion.

Readers rate the

What's most important to you? Quality? Price? Serviceability? Here's what landscapers and golf superintendents think of today's mowing equipment.

■ Scag is the favorite make of mowers in the landscape maintenance market, and Toro takes top honors among golf course superintendents, according to an exclusive survey commissioned by *LANDSCAPE MANAGEMENT* magazine this summer.

In four of six categories, Scag was ranked by landscape contractors as being number one among 11 brands of commercial mowing equipment. Those four categories: quality, serviceability, dealer/distributor support and warranty.

"This is very gratifying to hear," says John Crowson, Scag's national sales manager. "Durability and serviceability are two attributes that we've worked very hard toward. For the professional lawn cutter, it's so critical to keep the machines out in the field and not have to deal with downtime."

Six hundred LM readers who identify themselves as landscape contractors were polled by an independent research firm. They were asked to rate each of the manufacturers on a scale of 1.0 (very good) to 5.0 (poor) in the six categories of quality, serviceability, parts availability, dealer/distributor support, warranty and price.

Scag's scores of 1.5 in quality, 1.4 in serviceability and 1.9 in warranty far exceeded any of the other manufacturers.

"For a little company in Wisconsin, we get out there pretty

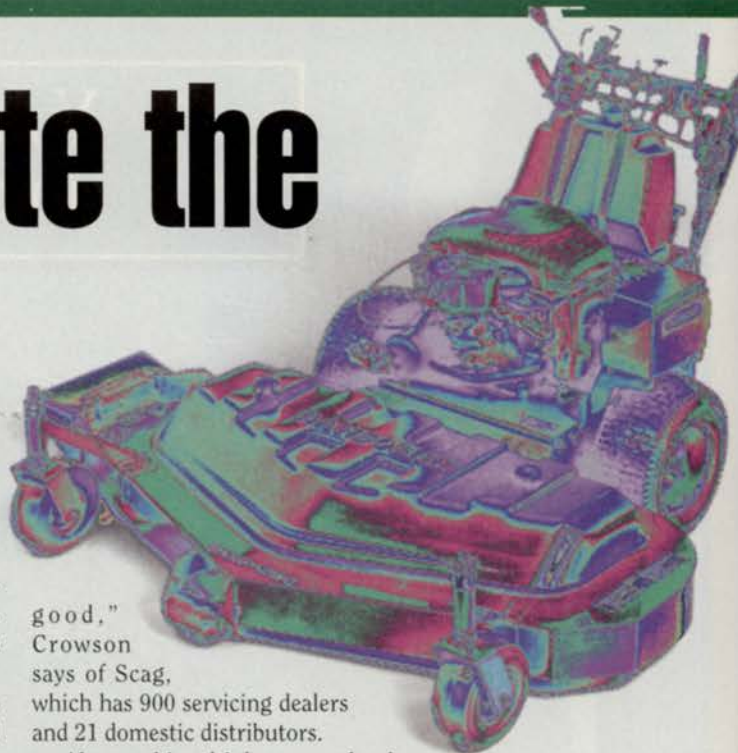
good," Crowson says of Scag, which has 900 servicing dealers and 21 domestic distributors.

Also ranking high among landscapers were John Deere (tied for first in parts availability with Scag, second in support, tied for second in warranty) and Lesco (first in price, tied for third in serviceability). Ransomes received four top-three mentions, Toro two and Encore one. (See charts below for results.)

The survey also noted that the average landscaper owns about four small walk-behinds, five midsize (30- to 60-inch) mowers and two large walk-behinds. Landscapers also reported owning an average of 1.9 riding rotaries smaller than 48 inches, 2.3 of 48-60 inches, 2.4 of 60-72 inches, and 1.9 larger than 72 inches.

Most landscapers expect their 30-inch and larger walk-behinds to last about 5.5 years. Small walk-behinds, the survey reported, last just over 3.5 years.

Golf course superintendents voted Toro best in quality, serviceability, parts availability and warranty among five mower



LANDSCAPERS RATE...

FOR QUALITY:

| | |
|-------------------|-----|
| 1. Scag | 1.5 |
| 2. Toro | 1.7 |
| 3. Ransomes | 1.8 |

FOR WARRANTY:

| | |
|-----------------|-----|
| 1. Scag | 1.9 |
| 2. Encore | 2.1 |
| Deere | 2.1 |

FOR PARTS AVAILABILITY:

| | |
|----------------|-----|
| 1. Deere | 1.8 |
| Scag | 1.8 |
| 3. Toro | 1.9 |

FOR PRICE:

| | |
|-------------------|-----|
| 1. Lesco | 2.1 |
| 2. Ransomes | 2.2 |
| 3. Jacobsen | 2.4 |
| Scag | 2.4 |

FOR SERVICEABILITY:

| | |
|-------------------|-----|
| 1. Scag | 1.4 |
| 2. Toro | 1.8 |
| 3. Ransomes | 1.9 |
| Lesco | 1.9 |

FOR D/D SUPPORT:

| | |
|-------------------|-----|
| 1. Scag | 2.0 |
| 2. Deere | 2.1 |
| 3. Ransomes | 2.3 |

MOWERS

brands included in the golf portion of the survey. Toro's raw score of 1.5 in quality was best by far.

"When you put the whole package together, you're talking about a commitment to the customer by Toro and its distributors," says Toro director of marketing Denny Brown. "Our theme line is 'helping you put quality into play,' but [service, parts, warranty] are all important elements of our sales and marketing philosophy."

Jacobsen and Deere also received outstanding marks from the superintendents in most categories. (See charts at right for results.)

According to the survey, the average golf course owns about four walking greensmowers, three riding greensmowers, two or three triplexes and about two five-gang mowers. The survey also noted that superintendents expect most mowing equipment to last 7.5 to 8 years, with walking greensmowers lasting an average of nine years.

—Jerry Roche

How important is?...

Q

uality: that one word that means so many different things to so many different people, is the most influential factor in selecting mowing equipment, according to LANDSCAPE MANAGEMENT's mowing equipment study.

Eighty-nine percent of all landscapers said quality is "very influential" in the buying decision; 84 percent of the golf course superintendents concurred.

Next most influential factor among landscapers is serviceability (69%) while parts availability is second-most important among superintendents (58.9%).

Interestingly, price was listed fifth of six factors influencing the buying decisions of landscapers. It was listed fifth of seven listed by superintendents.

Here are the number of respondents listing the following factors as being "very influential" in deciding which brand of mowers to purchase:

—J.R.

LANDSCAPERS

1. Quality (89%)

2. Serviceability (69%)

3. Parts availability (63%)

4. Dealer/distributor support (53%)

5. Price (31%)

6. Warranty (27%)

GOLF COURSE SUPERS

1. Quality (84%)

2. Parts availability (59%)

3. Serviceability (59%)

4. Dealer/distributor support (46%)

5. Price (35%)

6. Warranty (26%)

7. Brand name (13%)

GOLF SUPERS RATE...

FOR QUALITY:

| | |
|-------------------|-----|
| 1. Toro | 1.5 |
| 2. Jacobsen | 1.8 |
| 3. Deere | 2.1 |

FOR PARTS AVAILABILITY:

| | |
|-------------------|-----|
| 1. Toro | 1.9 |
| 2. Jacobsen | 2.1 |
| 3. Deere | 2.4 |

FOR PRICE:

| | |
|-------------------|-----|
| 1. National | 2.2 |
| 2. Lesco | 2.3 |
| 3. Jacobsen | 2.5 |

FOR WARRANTY:

| | |
|-------------------|-----|
| 1. Toro | 2.0 |
| 2. Jacobsen | 2.2 |
| 3. Deere | 2.3 |

FOR SERVICEABILITY:

| | |
|-------------------|-----|
| 1. Toro | 1.9 |
| 2. Jacobsen | 2.1 |
| 3. Deere | 2.3 |

FOR D/D SUPPORT:

| | |
|-------------------|-----|
| 1. Jacobsen | 2.0 |
| 2. Toro | 2.2 |
| 3. Deere | 2.5 |

Turf pros respond to biostimulants

■ Biostimulants improve turfgrass vigor. Their effect is most observable on stressed turfgrass. Exactly how they do this is being researched.

A decade ago, many turfgrass professionals scoffed at the idea of spraying something like processed seaweed extract on turfgrass. They're listening now. And they're also buying so-called plant biostimulants in record amounts.

Emerald Isle says it began selling PanaSea to turf pros 16 years ago. "For the first years of our company we spent all of our time creating awareness that biostimulants could be useful," says company spokesman Doug Middleton.

Now, as many as 15 companies may be selling them to turfgrass managers. This rush started after Roots Inc., New Haven, Conn., initiated a strong marketing campaign about seven years ago. The company, using independent research, documented *real* benefits to turfgrass (trees and shrubs, too) with its product. That opened eyes. Even competitors admit that Roots helped legitimize and broaden the use of biostimulants for turfgrass.

But really, what is a biostimulant?

"For marketing purposes, the industry started describing these products as stimulants and the word 'bio' got put on it too. It stuck and it's descriptive," says Dr. R.E. "Dick" Schmidt. "We could call them stimulative growth regulators. That would probably be more accurate, but that's a mouthful."

Many people loosely describe biostimulants as products that contain plant hormones, often—but not always—along with other growth enhancement ingredients. (Some more broadly include *non*-hormone, non-nutritive growth stimulators, too.)

All plants produce hormones. Three of a plant's five hormones stimulate growth—auxin, gibberellins, and cytokinin. Cytokinin is the hormone most commonly found in manufactured biostimulants, although some contain trace amounts of the others too. The most popular natural source of cytokinin is seaweed.

Schmidt's research at Virginia Polytechnic Institute helped popularize biostimulants. Others like Drs. Michael

Goatley of Mississippi State, Dr. Keith Karnok of Georgia and Dr. Tom Turner of Maryland added to Schmidt's data.

Companies claim, in varying degrees, that their respective products:

- ✓ improve turfgrass rooting
- ✓ improve drought resistance
- ✓ provide a level of salt tolerance
- ✓ improve plant density and color
- ✓ decrease nutrient requirements

How well, and under what conditions, they provide *all* of these benefits is still being sorted out.

"It's probably not the product itself that's the reason for any skepticism. It's the claims surrounding the product," says Johnny McRight, McRight Agri-Management, Greenville, Miss.

Adds William Byrnes, president of Floratine Products Group, Memphis, Tenn., "Unfortunately, a salesman's first inclination is to say that their product will solve all problems all the time and, of course, that's impossible."

The theory behind adding biostimulants to turf is simple, says Byrnes. During periods of stress, turfgrass depletes its supply of hormones and welcomes a boost from an outside source. That's when biostimulants produce visible and positive results.

"We're not trying to change what the plant does. We're simply trying to help it do what it does naturally."

End users typically spray biostimulants onto turfgrass. They can be applied alone, with fertilizer, or with iron. Schmidt favors biostimulants with iron.

"You end up with more root biomass; more root biomass translates into more root-to-soil contact for mineral and water uptake," says Jim Schaefer, president of Soil Technologies, Fairfield, Iowa.

Several products marketed to turfgrass managers also contain "growth-enhancing" substances in addition to hormones. Iron, nitrogen-fixing bacteria, sugars, and humic acid are not uncommon. Build healthier soil and grow healthier turfgrass, say producers of these products, adding that these products boost populations of beneficial microorganisms, make nutrients more available for uptake, create more pore



Dale Minick, superintendent at Kirtland Country Club near Cleveland, is convinced that biostimulants boost plant health.

'Why quit using it now?'

■ If traffic's not bad, you can drive due east on I-90 from downtown Cleveland to the Kirtland Country Club golf course in about 35 minutes. You trade skyscrapers and steaming manholes for a country estate with freshly mowed turfgrass on rolling hills.

From appearances, you're on a different planet.

Superintendent Dale Minick oversees this greener, quieter world, and his philosophy is: if your turfgrass ain't broke, don't fix it. That's why Minick has used a biostimulant (PanaSea) on the course for the past 12 years.

"I don't want to quit using it and find out why I was using it in the first place," says Minick, superintendent at Kirtland.

"Every time the USGA has come out, they've always commented on the root system of the turfgrass here. I've got to believe the biostimulant is part of that," he says.

Minick's crew sprays the biostimulant, sometimes with fungicide, on 32 acres of fairways and about 6 acres of tees and greens. Tees, greens and fairways are all bentgrass. The course hosts about 17,000 rounds each season. He estimates he spends about \$4,000 each year on the biostimulant.

"I don't use it to reduce using something else," says Minick. "I do know that we don't do very much syringing during summer afternoons. I think that has something to do with the biostimulant."

He uses biostimulant on the golf course's perennial gardens too. "There you can really see the root growth because you can pop the flower out and check the roots," he says.

Minick grew up in nearby Kirtland, attended The Ohio State University and has worked at Kirtland CC, in one capacity or another, nearly his entire adult life. A pretty fair golfer in his own right, he's been superintendent at Kirtland the past 15 years.

—Ron Hall

spaces in the soil. Some even contain fertilizer.

"The end users get so darned confused because everybody is calling everything a biostimulant," says Doug Middleton, Emerald Isle.

That might be, but Schaefer of Soil Technologies says there is no going back. He claims turfgrass managers now recognize that their nutrient management programs go beyond N, P, K. "There are more

refined, more intelligent approaches to deal to deal with the management of quality turfgrass rather than using nitrogen, a single element, to try to solve so many damn problems," he says.

So far, the most enthusiastic turf users of biostimulants have been golf course superintendents and sod farms, say suppliers. Superintendents regularly apply them to greens, and sometimes tees. The program costs from \$1,000-\$2,000 a season to

the budget of a northern 18-hole course. Some landscapers claim they help transplants recover faster.

Lawn care operators have been slow to incorporate these new products into their programs.

"Their big question is always—can I afford to put this on customers' lawns without charging something extra?" says one supplier.

—Ron Hall

TURF BIOSTIMULANTS

| Company | Product | Description |
|--|---|--|
| American Colloid Co. Circle No 311 | Enersol 15%, Enersol SC | Nutritional chemical activator, derived from humic acid; promotes beneficial soil microbes. |
| Aqua-Aid Circle No 312 | Aqua-Root Liquid | Soil penetrating, plant stimulant, wetting agent (85%), humic and fulvic acids (15%). |
| BioPlus Manufacturing, Inc. Circle No 313 | BioPlus Turf Mix, HV682 | TurfMix: biostimulant, micronutrients, wetting agent HV682: vitamins, hormones, PGRs and root growth stimulators. |
| EcoSoil Systems, Inc. Circle No 314 | BioJect | System to create healthier turf by fermenting and injecting beneficial microorganisms into the soil. |
| Emerald Isle Ltd. Circle No 315 | PanaSea, PanaSea Plus | Liquified sea plant extracts, exclusive extraction processes maximize yield of nutrients, hormones, other beneficial constituents. |
| Floratine Product Group Circle No 316 | Astron, Per "34" Max, Knife Renaissance | Formulations for cool, warm-season turfgrass. Unique combinations of essential secondary and micronutrients with naturally-occurring plant extracts complexed in organic acid and sugar compounds. |
| Growth Products Circle No 317 | Essential | Carbon-rich organic materials in constructive, usable form for soil, plant, microorganisms. |
| Huma Gro Turf Circle No 318 | Start 0-0-0 | Creates prime conditions for seed germination and root development. Stimulates beneficial biological organisms to influence the rhizosphere. |
| Humate International Inc. Circle No 319 | humate products | Extremely soluble; high percentage of fulvic acid, high cation-exchange capacity. |
| Lesco Circle No 320 | BioChoice | EPA-registered formulation of two hormones: auxin and gibberellic acid in a chelated source of essential micronutrients. |
| McRight Agri-Management, Inc. Circle No 321 | Turf Touch | Proprietary blend of activated nutrients that are designed to improve growth and activity of microorganisms. |
| Organic Laboratories, Inc. Circle No 322 | BioStim | Enriches soil with proteins, carbohydrates, amino acids, humates, enzymes, plant extracts, vitamins, minerals. |
| Plant BioTech, Inc. Circle No 323 | Cytogro, CytoFe | Liquid turf biostimulant derived from seaweed extracts with cytokinins and auxins. CytoFe: a formulation containing CytoGro plus 5% iron. |
| Plant-Wise Circle No. 324 | 3D | A concentrated biostimulant derived from pure quality, cold process seaweed, fortified with proprietary humic acid and beneficial plant growth nutrients. |
| Regal Chemical Co. Circle No 325 | Regal Crown | Balanced combination of PGRs prepared in nutrient broth in which selected bacteria, yeast fungi have been grown under strict conditions. |
| Roots Inc. Circle No 326 | Roots, IronRoots | Organic plant and soil conditioners with peat humic substances, cold-processed sea kelp extracts, plant co-enzymes and Vitamin B1. |
| Soil Technologies Corp. Circle No 327 | Bio-Pro | Warm, cool-season formulas. N-fixing bacteria, seaweed extract, humic acids, plant growth hormones, plant foods. |

Source: LM mail and phone survey, August, 1994

Plant bulbs now, and get thanks in the spring

Your customers will love it when, with spring just peeking through the clouds, fall-planted bulbs begin to sprout colorful blooms.



Bulbs planted in pots add vivid color to a landscape site, without disturbing the turf.

■ If your customers would like to have flowers in your yard as early as next January, this is the time to plant bulbs, according to Penn State horticulture professor Dr. J. Robert Nuss.

"They're easy to plant, and they live for years," says Nuss. "Best of all, they start brightening the landscape while it's still late winter."

Spring and early summer flowering bulbs "must be planted in the fall in order to develop a good root system and satisfy the cold requirement of the specific bulb," notes Dr. A.A. De Hertogh of North Carolina State University, writing for the Netherlands FlowerBulb Institute. "In general, it is best to wait until soil temperatures are below 60° F. at the optimal planting depth."

Temperatures play an important role in bulb life, according to De Hertogh.

"When fall-planted bulbs have been purchased but are not yet planted, they should be stored between 55° and 65° F. and in a well-ventilated condition," he notes. "Do not keep them in paper or plastic bags unless specified. If bulbs are to be pre-cooled for (USDA) climatic zones 9 or 10, they should be held at 40-45° F. for 8 to 10 weeks

before planting in December."

Nuss and De Hertogh offer several bulb planting suggestions:

- Spring-flowering bulbs can be planted in formal or informal beds, rock gardens and in established ground covers.

- Most prefer partial shade, so avoid planting them where they will receive direct midday sun. Direct southern exposures are also not recommended.

- Heated basement walls can damage bulbs, so plant them at least five feet away from foundations.

- Care should be taken to eliminate all perennial weeds (quackgrass, Johnsongrass, bermudagrass, etc.) before planting.

- "Keep in mind that you can fit a lot of bulbs in one space by planting large bulbs, covering them with two inches of soil and planting small bulbs on top of them," says Nuss. "You can also plant shallow-rooted annuals on top of bulbs."

- Bulbs need good drainage and a high amount of organic matter with soil pH of 6 to 7. So if the soil is mostly sand or clay, mix in peat moss or compost until the organic matter is about 25 percent of the volume.

apart and five inches deep.

- De Hertogh says one of two fertilization regimes is best:

- (1) a single fall application of a sulfur-coated slow-release 9-9-6 fertilizer at planting time at a rate of one rounded tablespoon per sq.ft.;

- (2) bone meal incorporated in the rooting area at planting time with an application of 8-8-8 (one level tablespoon per sq.ft.) or 10-10-10 (one rounded teaspoon per sq.ft.) in the fall, followed by a repeat application of the same fertilizer as soon as the shoots break the ground in the spring.

- After placing the bulb, fill the hole. Replace half the soil and water the area thoroughly, add the remaining soil, and water again.

- "A three-inch layer of wood chips, peat moss or bark will retain moisture and keep mud from splashing on the flowers next spring," says Nuss.

- If you anticipate a squirrel or chipmunk problem, spread fine-mesh chicken wire over the soil and apply mulch to keep the pests from digging up the bulbs.

- In the spring or summer, as flowers fade, cut them off so they don't go to seed and rob nourishment from the bulbs.

"The foliage gathers nutrients for the next season's growth, so allow it to completely die before removing it," says Nuss. "Other than these few steps, spring-flowering bulbs don't need much attention. They'll come back year after year, just when winter seems it will never end."

EDITOR'S NOTE: To receive a free, 28-page full-color booklet "Landscaping: Flower Bulbs for Long-Term Planting," write: BULBS, Landscape Management, 7500 Old Oak Blvd., Cleveland, OH 44130. Only the first 100 requests will be honored. These booklets are being provided to LM readers courtesy of the Netherlands FlowerBulb Information Center, Brooklyn, N.Y.

FOR PLANNING PURPOSES, THE BASIC PLANTING PERIODS ARE:

USDA ZONE

PLANTING PERIOD

3

September

4 and 5

September to early October

6

October

7 and 8

November to early December

9

late November to early December

10

December

(primarily pre-cooled bulbs)

- When planting tulips, daffodils and other large bulbs, dig out the whole bed to a depth of about eight inches. Arrange the bulbs six inches apart with the pointed ends up. Smaller bulbs such as crocuses and grape hyacinths can be planted three inches



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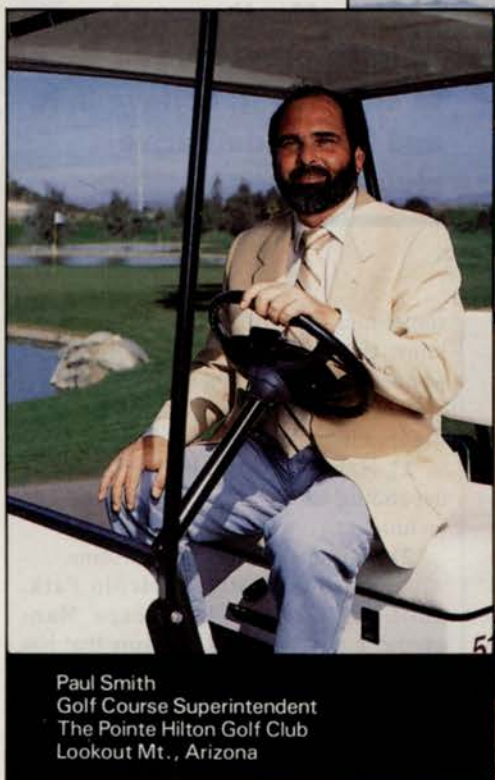
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SELECTED FLOWERING BULBS FOR FALL PLANTING IN THE U.S.

| NAME | COLOR | LIGHT REQ. | PLANT. DEPTH | SPACING | FLOWER. PERIOD | PLANT HEIGHT | HARDI-NESS | ADAPTED ZONES (USDA) |
|-----------------------------------|-----------|------------|--------------|---------|----------------|--------------|------------|----------------------|
| Allium (ornamental onions) | | | | | | | | |
| aflatunense | purple | sun | 5" | 4" | L | 25" | H | 3-8 |
| caeruleum | blue | sun | 5" | 2" | VL | 20" | S-H | 4-8 |
| christophii | purple | sun | 5" | 8" | VL | 20" | H | 3-8 |
| cowanii | white | sun | 5" | 4" | L | 16" | T | 8-10 |
| elatum | purple | sun | 8" | 8" | L | 30" | H | 3-8 |
| giganteum | purple | sun | 8" | 8" | VL | 40" | H | 3-8 |
| neapolitanum | white | sun | 5" | 4" | M | 15" | T | 7-10 |
| Amaryllis (Hippeastrum) | | | | | | | | |
| hybrids | various | sun | 8" | 10" | L | 35" | T | 7-11 |
| Anemone | | | | | | | | |
| blanda | various | sun | 5" | 2" | E | 4" | H | 3-7 |
| coronaria | mixed | sun | 5" | 3" | M | 10" | S-H | 7-9 |
| Brodiaea laxa | | | | | | | | |
| "Queen Fabiola" | blue | s/psh | 5" | 4" | VL | 12" | H | 5-8 |
| Crocus | | | | | | | | |
| chrysanthus | various | s/psh | 5" | 2" | VE | 3" | H | 3-8 |
| flavus | yellow | s/psh | 5" | 2" | E | 3" | H | 3-8 |
| sieberi | blue | s/psh | 5" | 2" | VE | 3" | H | 3-8 |
| tomasinianus | purple | s/psh | 5" | 3" | VE | 4" | H | 3-8 |
| vernus | various | s/psh | 5" | 3" | E | 4" | H | 3-8 |
| Eremurus | | | | | | | | |
| various | pastels | sun | 5" | 12" | VL | 30-70" | H | 4-7 |
| Galanthus | | | | | | | | |
| (Snowdrops) | white | sun | 5" | 2" | VE | 4" | H | 3-8 |
| Hyacinthus | | | | | | | | |
| orientalis | various | sun | 8" | 4" | E | 10" | 3-8 | |
| amethystinus | blue, wh. | sun | 5" | 4" | L | 10" | H | 3-8 |
| Iris | | | | | | | | |
| (English Iris) | purp/blu | sun | 8" | 6" | VL | 20" | H | 3-8 |
| hollandica | various | sun | 5" | 4" | L | 20" | S-H | 8-10 |
| reticulata | various | s/psh | 5" | 2" | VE | 6" | H | 3-8 |
| Lilium | | | | | | | | |
| (Madonna Lily) | white | s/psh | 5" | 6" | VL | 20" | S-H | 5-9 |
| Muscari | | | | | | | | |
| Grape Hyacinth | blue | sun | 5" | 4" | M | 6" | H | 3-8 |
| azureum | blue | sun | 5" | 1" | E | 5" | H | 3-8 |
| botryoides album | white | sun | 5" | 1" | M | 5" | H | 3-8 |
| Narcissus spp. | | | | | | | | |
| (Daffodils) | various | s/psh | 5-8" | 4-6" | E,M,L | 10-14" | H | 3-9 |
| Paperwhites | white | sun | 8" | 4" | VE | 14" | S-H | 8-11 |
| Oxalis spp. | | | | | | | | |
| (Shamrock) | various | sun | 1" | 2" | M | 6" | S-H | 7-9 |
| Scilla (Endymion) | | | | | | | | |
| Span. blue-bells | various | s/psh | 5" | 4" | L | 12" | H | 3-8 |
| Siberian Squill | blue | sun | 5" | 3" | E | 5" | H | 3-7 |
| tubergeniana | white | sun | 5" | 3" | VE | 6" | H | 3-7 |
| Sparaxis | | | | | | | | |
| tricolor | various | sun | 5" | 3" | VL | 10" | S-H | 6-9 |
| Tulipa spp. | | | | | | | | |
| (Tulip) | various | s/psh | 8" | 4" | M/L | 6-15" | H | 3-9 |

ABBREVIATIONS: s/psh=sun, partial shade...purp/blu=purple and blue
 VE=very early...E=early...M=medium...L=late...VL=very late
 H=winter hardy...S-H=semi-hardy...T=tender.

Source: Netherlands FlowerBulb Institute



Paul Smith
Golf Course Superintendent
The Pointe Hilton Golf Club
Lookout Mt., Arizona



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STAFF TRAINING: more than books



Joe Bowers helped write Willow Valley's training manual.

For an effective employee training program, you have to envision it, believe in it, and have a definitive philosophy.

by John B. Calsin, Jr.

■ What is staff training?

● Is it watching a Lesco video on "Rotary Spreader Calibration" or "Irrigation Maintenance & Troubleshooting"?

● Is it, as the Associated Landscape Contractors of America says in its Safety Resource Manual: "Tailgate meetings... informal, on-the-job training and discussion sessions that bring the hands-on approach" involving a foreman and technician?

● Is it attending one of the Southern California Turfgrass Council's annual Turf, Landscape & Sports Institute sessions, complete with Spanish translation?

● Is it studying during the Davey Institute of Tree Sciences' comprehensive, four-week tree care training course?

● Is it sometimes a pain in the neck?

● Or is it all of the above—and more?

Here's an overlooked basic: "Anybody who comes in contact with customers becomes your company. If they're not responding to clients and the clients' needs, (the employees) are giving an image you don't want to have." So says Gina Schlesinger, president of Catalyst Resource Group in Springfield, Pa., a company that specializes in communica-

tion skills.

Schlesinger believes that one aspect of training is to help employees understand that the service provided to a customer is crucial and may be pivotal. It can lead to customer dissatisfaction, excessive costs, or to lost business. On the other hand, if the employee really understands that he or she is the company, positive interaction will mean satisfied customers and a stronger bottom line.

Writing the manual—Joe Bowers is manager of grounds at Willow Valley, a resort/business-and-conference-center/golf course in the Amish countryside of Lancaster, Pa.

Working with his predecessor John Rowe, Bowers helped write Willow Valley's training manual. The manual has a section on turf, with a subsection on overall mowing techniques and standards, with a sub-subsection, titled "Crossing Paved Surfaces."

Bowers or other experienced employees train new employees on each piece of equipment, working up from the less technical and dangerous to the more complicated. "We take time to show them the individual pieces, even pole pruners, before we turn them loose," Bowers says.

However, "it does get nerve-racking

sometimes. I'm sitting in my office and I know there is a new guy out there...(I wonder) how he's going to do."

Bowers has two suggestions for writing training manuals:

1) Make them fluid, able to evolve depending on changing equipment and techniques.

2) Don't make them cumbersome.

Across the country in Menlo Park, Calif., is Gachina Landscape Management, a six-year-old company that has grown big and fast. General manager Lance Schendorf wants Gachina's customers to view his employees as professionals and "not just janitors that work outside." So the company became involved in the California Landscape Contractors Association's Certified Landscape Technician program.

Schendorf says that seven of 77 total employees have either completed the program or passed one or more of its written and practical parts.

Two languages—Gachina has another training program, too: English as a second language for its Hispanic employees. The classes, offered at a nearby vocational technical school, are organized in five-week units. The votech provides the instructor and the company pays the cost.

"This program is so rewarding," Schendorf says, "it gives us goose bumps. The employees want to learn. Their faces just light up."

Gachina also offers in-house, one-on-one training on skills like mower operation, in either English or Spanish.

In Kent, Ohio, Davey Tree Expert's training programs "have kept us on the cutting edge," according to Dr. Roger Funk, vice president of human and technical resources.

In the winter of 1908, Davey began its formal training program. It has evolved into including employee orientation, at the annual four-week Davey Institute of Tree Sciences (D.I.T.S.) that simulates a



Newer employees should be supervised by veteran employees during instruction.

university classroom environment.

Computers used in the D.I.T.S. "level the ground for everyone, no matter what their previous education level," Funk says. During the training, a 3-D animation of a tree trunk developing allows trainees to see the inner workings of the tree as it grows: physiological changes, cell division and the like. In other words, the tree grows right before the student's eyes.

A philosophy—A company, Funk believes, without a planned growth strategy (that includes education) is bound to develop inconsistent practices. Customers do not get the same quality and type service from site to site.

"For companies in today's world, training employees is important to satisfying and retaining customers," Funk contends. "Training is a means of acquir-

ing good employees and keeping them—without which there are no customers."

Staff training is a two-way street: (1) management's attitude toward the employee and helping him or her do a better job; and (2) the employee's desire and then action to take advantage of management's willingness and helpfulness in learning more.

Staff training is not a matter of materials, courses or seminars. There are plenty of those. It is a philosophy with benefits for everyone.

— The author is a freelance writer based in West Chester, Pa.

He is a frequent contributor to LM. Training photos by Albin P. Dearing, Davey Tree Expert Co.

It's the atmosphere...

■ "Atmosphere makes a difference," says Dr. Roger Funk of the Davey Tree Expert Company, discussing employee training. The problem is how to fit a training area in between riding mowers, leaf blowers and the workbench.

Here are some possible suggestions:

1) Have a specific area set aside as a learning zone, training area or classroom.

2) Make sure the training area has desks or tables and chairs specifically for training.

3) Keep training manuals, professional publications (including *LANDSCAPE MANAGEMENT!*) and textbooks in this location.

4) Encourage employees to receive and read trade journals.

5) See *LANDSCAPE MANAGEMENT's* January 1994 issue ("Rainy Day Training") for training videos available.

6) Try and cultivate a positive attitude toward staff training.

7) Set up a budget line item specifically for training purposes.

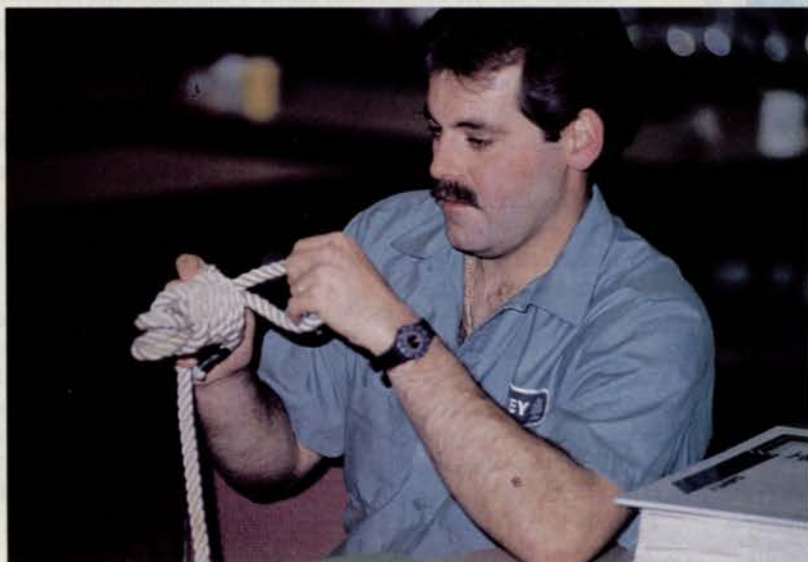
8) Encourage—and help pay for—attendance at "off-season" trade shows. This might be part of an employee incentive program or bonus to qualified employees.

9) If there is a college or university nearby, talk with the continuing education department about developing an internship program. For college credits, a student in the education department might help you set up a training program and then help conduct the training.

10) Most importantly, cultivate a training mind-set.

—J.B.C.

Even something as basic as rope-tying is covered in Davey Tree's training.



EPA's plan standardizes posting

Agency recommends posting for LCOs, parks, golf courses and homeowners; doesn't rule out federal posting law.

■ You have until Oct. 31 to write to the U.S. Environmental Protection Agency (EPA) and comment on its plan seeking standardized posting requirements for pesticide applications.

That was the date set in an EPA position paper that "strongly recommends" that pesticide posting programs be the same wherever they're instituted. The EPA's effort is aimed at the 19 states and the few local governments with posting. It also provides guidance for those jurisdictions considering posting.

The EPA's document is finding mixed reviews in industry. The biggest stumbling block: homeowner posting. EPA's recommendation suggests that homeowners post too. So far, only Connecticut and Prince George's County, Md., require homeowner posting.

Allen James of Responsible Industry for a Sound Environment (RISE) believes the

For golf courses:

CATEGORY C

PESTICIDES ARE PERIODICALLY APPLIED TO THIS GOLF COURSE

EPA "has overstepped" its purpose. "As far as we can tell, states have not asked the EPA for this type of guidance," he says.

"Rise will respond. There is no question about that," he says. The organization is contacting member companies for their views. Much of the RISE membership is chemical manufacturers and formulators.

But lawn care companies, long subject to posting, feel that standardization of posting is probably a good thing.

"Most importantly, standardization will facilitate education, especially of children, concerning the meaning of the signs and appropriate behavior to avoid exposure," says the EPA document.

Norm Goldenberg says his company, TruGreen/ChemLawn, favors standardizing warning sign and, in general, favors posting. "For the most part, the lawn care industry already posts," he points out.

For public parks, school grounds, recreational fields, cemeteries:

CATEGORY B

CAUTION, PESTICIDE APPLICATION. KEEP OFF

(LAWN TREATMENT DATE)



"I think it's terrific," adds John Buechner, director of technical services, Lawn Doctor Inc., Marlboro, N.J. "It's the fruition of years of work by a lot of lawn care people to get the EPA to recognize our concern over homeowner application."

Tom Delaney, government affairs manager for the Professional Lawn Care Association, however, thinks the EPA guidance paper may encourage states that don't have posting to consider it. And, he says, "it increases the likelihood that environmentalists in states with no regulations will get their hands on this." Delaney specifically mentioned Texas and Minnesota, states that have already considered posting.

EPA's guidance document divides posting into three categories:

Category A, private lawns and lawns surrounding publicly-accessible buildings: 4x5-inch sign, graphic design will include an adult, child and dog standing on a lawn within a circle slash;

Category B, public parks, school grounds, recreational fields, cemeteries: 8½x11-inch

CATEGORY A

For private lawns and lawns surrounding publicly-accessible buildings:

CAUTION, PESTICIDE APPLICATION. KEEP OFF

(LAWN TREATMENT DATE)



sign, graphic same as Category A;

Category C, golf courses: 2x3-foot sign with no graphic.

EPA recommends that the signs have a bright yellow background with black lettering. Category A and B signs can be made of rigid *recyclable* (their emphasis) plastic or coated cardboard. Sign and printing must remain legible for up to 48 hours. The bottom of the sign should be at least 18 inches above the ground.

Wording for Category A and B: "Caution, Pesticide Application. Keep Off" in two lines with a third, bottom line displaying the lawn treatment date. On golf courses, the EPA is recommending the wording "Pesticides are periodically applied to this golf course" in letters 2½ inches high plus other information.

For turf treatments in either Category A or B, signs should be posted at all common or conspicuous points of entry, at least one sign for every 10,000 sq. ft. of lawn treated. On golf courses, signs should be posted at first and 10th tees or at a central clubhouse location.

The EPA says professional applicators are responsible for supplying and posting signs, while do-it-yourselfers will get theirs from retailers as part of a "good neighbor" policy.

The EPA did not rule out the possibility of instituting a national mandatory posting program.


"At this time, EPA has not made any determination as to the necessity of instituting mandatory Federal posting program in order to reduce or prevent unreasonable adverse effects," said the position paper.

To comment in writing: Linda Leola P. Murray, Communications Branch (7506C), Field Operations Division, Office of Pesticide Programs, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460.

—Ron Hall

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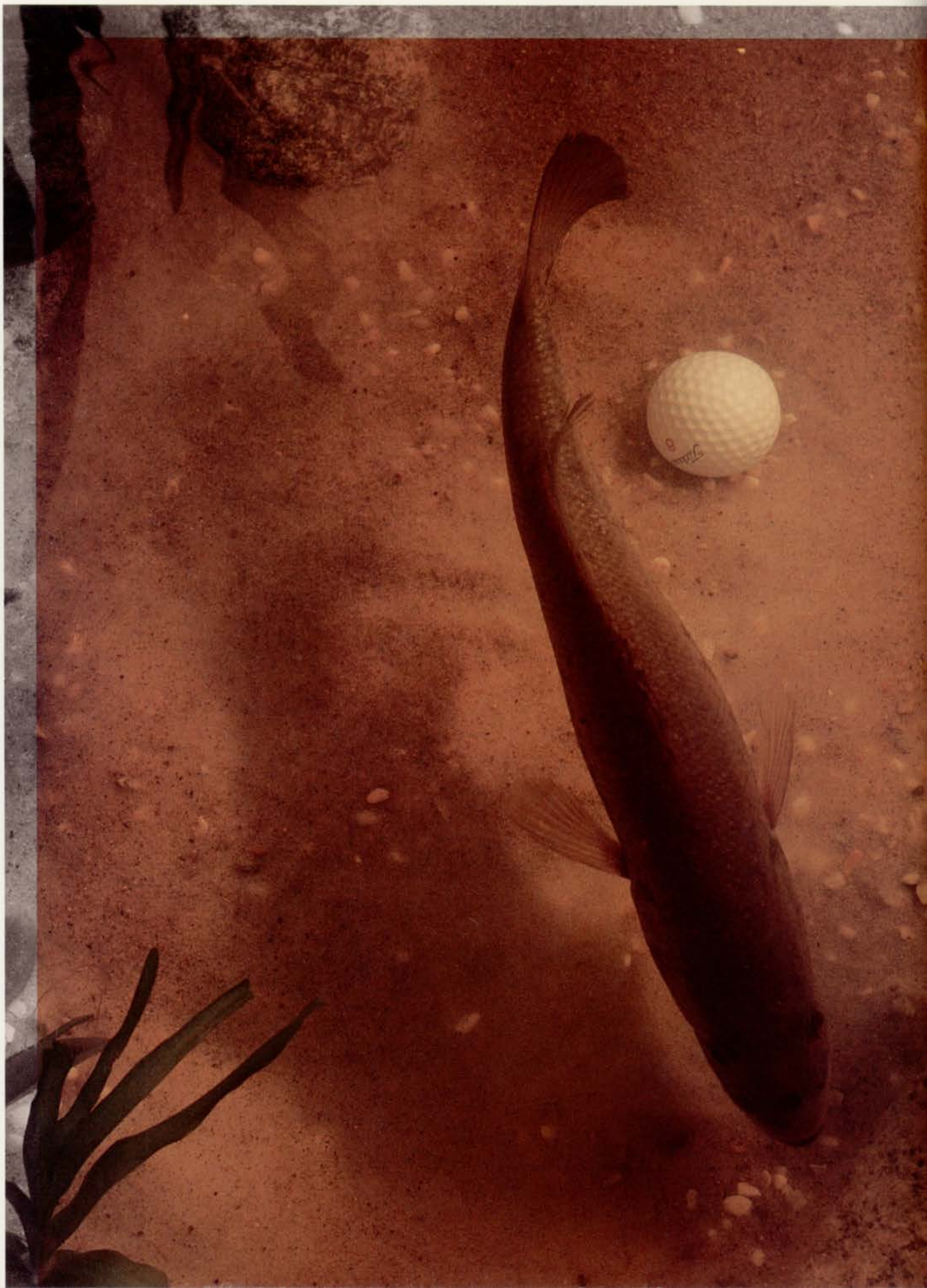
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| European chafer | |

CROWN-INHABITING INSECTS:

Billbugs *Hyperodes* weevil (Annual bluegrass weevil)

ORNAMENTAL INSECTS:

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|-----------------|----------------------|
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| Aphids | Pine tip moth larvae |
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GOLF & ATHLETIC TURF

LEADERS of the PACK

PGRs on fairways and deep aerification are just two ways that today's superintendent is responding to the challenge of better maintenance for better golf courses.

■ Using plant growth regulators (PGRs)—for *Poa annua* suppression and less frequent fairway mowing—is perhaps the fastest-growing trend among golf course superintendents across the nation.

"I've done a little of it," admits **Joe Alonzi** of Westchester Country Club in Rye, N.Y. "The PGR apparently weakens the poa but doesn't affect the bentgrass. It also slows plant growth so you don't have to mow it as often.

"If you're going after the poa, there's some yellowing, but if you just want to cut down on mowing, you don't see as much (discoloration). The rates are different."

Mark Esoda at Atlanta Country Club, **Rick Boehm** at Wright Patterson Golf Course in Beavercreek, Ohio, **Tom Kintzer** at Carlisle (Pa.) Country Club, **Dave Dutton** at the Links of Stono Ferry in Hollywood, S.C. and **Gene Daniel** at River Hills Country Club in Lake Wylie, S.C. also reportedly use fairway growth regulators.

Though at least half a dozen PGRs are available to the golf course market, the

product of choice seems to be Primo, introduced in 1993 by Ciba Turf & Ornamental.

Dr. Joe DiPaola, technical representative for Ciba, says that field tests at Ohio State University show no phytotoxicity on plots where Primo is used at rates up to ¼ oz./1000 sq. ft.

Primo, DiPaola notes, allows superintendents to skip weekend mowings when courses are busy. In a bentgrass divot recovery study at Michigan State University, he further points out, "Primo was doing as well or better than check plots, and data on bermudagrass show similar results."

More aerification—Though aerification is not new, more superintendents are doing more of it. Deep aerators like the Verti-Drain and Floyd McKay Drill Aerofier give superintendents the opportunity to penetrate deeper into the soil profile.

"In the last five to seven years, the Verti-Drain and the variability you can have with it is just tremendous," says Brad

Settings like this one at Springvale Country Club in North Olmsted, Ohio, are becoming more popular as superintendents try to offer players and members a natural environment in which to play golf.

Kocher of Pinehurst (N.C.) Golf Club. "Everyone I know either has (a deep aerifier) or has access to one."

Aerification with the water-injection (Hydroject) process developed by Toro, Inc., is also becoming more popular. And greens rolling in combination with aeration promotes faster greens.

"I started rolling because of the PGA tournament we had here earlier this year," says Alonzi. "I found out that once you do it for the pros, you have to do it for the members, so we continued through the summer.

"I haven't found a drastic difference, but on hot windy days we might have to water a little more."

John C. Mood of Sandy Run Country

ELSEWHERE

Going from dirt to playing golf,
page 27

Non-monetary motivation,
page 30

Working out budget priorities,
page 32



'You'll see more courses just letting wildflowers and fescues grow.'

—Tim Smith
Hawk's Nest

Club in Oreland, Pa. also started rolling his greens this year.

Managing the wilds—More frequently, supers are letting some of their rough areas grow wild, a concession to the trend of "environmentally friendly" courses.

"We let wild (rough) grasses just grow and they look gorgeous—as long as you do it in areas that aren't in play," notes Alonzi. "I haven't gotten any complaints, either, except in marginal areas where some players have lost their golf balls."

Tim Smith, who supervises Hawk's Nest Golf Club in Creston, Ohio (see article, page 27) thinks trends like this make the course easier to maintain.

"We've got a course with more of a Scottish 'links' look," he says. "I think you'll see more courses just letting wildflowers and fescues grow. We've also planted trees in areas where it's easy to maintain around them, and we have tapered creek banks that we can run equipment down to the edge of."

C. Thomas Haudenschild of Highland Golf Club in Shelton, Conn. reports he's planted more wildflowers, and **Al Comeau** of Cummaquid Golf Club in Yarmouthport, Mass., says he's replaced some annual plantings with wildflower sod. **Wayne Brown** of Scovill Golf Course in Decatur, Ill. is using more ornamental grasses, wood chips and shrubs in place of grass.

The management—Supers are doing more in the way of public relations—especially public courses. For instance, Hinckley Hills Golf Course in Hinckley, Ohio sponsors a charity golf tournament. It's called the "Open Heart Open," and this year's was the 14th annual event.

"Ever since my father had open heart surgery, we've sponsored this tournament," says superintendent **Jean Esposito**. "All proceeds—usually about \$5,000—go to University Hospitals' cardiology research unit. We get the local distributor to contribute the use of Club Car golf cars, and a local restaurant donates the food service." All donations, Esposito says, are 100 percent tax deductible.

"After the tournament, we have an auction of collectibles from the Cleveland Indians and other American League



Kocher: Deep aerifiers popular with friends.



Esposito: Charity events for public relations.



Downing: Accepting managerial responsibilities.

New golf course maintenance trends

■ Here's what a variety of golf course superintendents reported they would do differently in 1994. The mini-survey was taken at the Golf Course Superintendents Association of America convention in Dallas earlier this year:

"ADDITIONAL PLANTERS"—**Faron Stoops**, Chambersburg Country Club, Scotland, Pa.

"ADDITIONAL FLORAL PLANTERS; ROOT FEEDING OF ALL TREES"—**Rich Pollock**, Eagle Run, Omaha, Neb.

"MORE PERENNIAL AND ANNUAL PLANTINGS"—**Kathy Eldridge**, Homewood Golf Course, Ames, Iowa

"BUNKER RENOVATION; INCREASING AERIFICATION PROGRAM; INITIATING USE OF MORE FLOWERING PERENNIALS"—**Frank Rendull**, City of Dayton, Ohio

"JUST BUILT A GREENHOUSE"—**Jack Birdwell**, Spring River Golf Course, Roswell, N.M.

"AERIFICATION OF TEES; SEEDING MORE THAN ONCE A SEASON"—**Richard Ahrens**, Decatur (Ill.) Park District

"USING 'EXHIBIT' TO CONTROL WEBWORMS; USING BIO-BACTERIA TO REDUCE BROWN PATCH PRESSURE ON BENTGRASS GREENS"—**Tom Schlick**, Marriott's Golf Club at Shiloh Falls, Pickwick Dam, Tenn.

"CONSTRUCTION OF SOIL FERTILITY MODIFICATION PROGRAM"—**Ron Mahaffey**, Oakhurst Country Club, Clayton, Calif.

"INTEGRATED PEST MANAGEMENT; NEW NEWSLETTER FORMAT"—**Paul Schippers**, The Moor's Golf Club, Portage, Mich.

"ENLARGE SOME TEES; BEAUTIFY CLUB ENTRANCE"—**John Segui**, Waynesborough Country Club, Paoli, Pa.

"AERIFY AROUND GREEN BANKS AND OVERSEED"—**Ken Smith**, Beechmont Country Club, Cleveland, Ohio.

—J.R.

teams, the Cleveland Browns and the Cleveland Cavaliers."

Finally, says **Dave Downing II**, "we've all had to be better managers." He's director of golf course operations at Wild Wing Plantation in Conway, S.C.

"We're all into more record-keeping, safety, training, public relations, budgeting, selling and communicating. But playing conditions are still very important: if the grass isn't right, you're hitting the road."

Kocher—like Downing, a multi-course superintendent—puts it this way:

"You've got to keep oiling the wheels. When people come visit our course, you want them to see that you continue to do new things and continue to maintain old things. If you're not doing that, then they're going to notice and maybe they'll go somewhere else. People vote with their feet."

—Jerry Roche

Going from dirt to golf: a whole new ballgame

Conscientious golf course superintendents like Tim Smith are involved in construction from the very beginning.

■ In 30 years working at four golf courses and country clubs, Tim Smith thought he'd seen it all. Then Mrs. Betty Hawkins hired him as superintendent of the new Hawk's Nest Golf Club she was building in a rural section of northern Ohio.

Smith found out that he hadn't really "seen it all."

"Everything that had to do with building the course was new to me," he remembers now. "I'd done little segments of it all, but I'd never gone from dirt to golf. And, believe me, it's a whole new ballgame."

In building the 18-hole course, contractors moved 350,000 cubic yards of soil. That included digging three lakes with seven surface acres of water. It also meant planting 350 new trees on what had previously been leased farmland.

Smith suggests that anyone involved with building a new golf course—superintendents included (superintendents especially)—make sure a good feasibility study is done beforehand. The study should include checking with the appropriate government agencies to comply with all laws. You'd be surprised, Smith says, at the wetlands regulations that exist, the pains associated with getting sewage lines installed and getting utility clearances.

"You run into lots of things you don't expect," Smith relates. "For instance, if you're drilling a well for water that more than 25 people will be using, you'll need \$3,000 to get EPA approval."

Getting the right architect and contractors are also key. The Hawk's Nest architect was Steve Burns; Central Florida Turf was the general contractor. Other contractors laid asphalt for cart paths, did additional excavation work, and designed and built the new clubhouse.

Because her family had been in business in the community for 40 years, Mrs. Hawkins did not necessarily go with the low bidder when selecting contractors.

"She wanted to keep as much money in the area as possible," Smith notes.

Bracing for problems—Tongue in cheek, Smith also recommends making sure the weather cooperates during construction and—especially—during the grow-in.

From ground-breaking in April, 1992 until Hawk's Nest's first nine holes opened in July, 1993, 128 days of construction



Most superintendents involved in golf course construction projects run into bottlenecks they don't expect. Tim Smith found he owed the EPA \$3,000 for approval of on-site wells.

time were lost to rain. Then, just before the front nine began growing in, the weather completely reversed itself.

"Mother Nature didn't cooperate at all, and that was two-thirds of my problem," notes Smith. "When we started running short of water, I cut off seeding the last two acres. The water was gone; if we'd had to go four more days, there weren't any more rabbits in the hat."

One of his employees was assigned the task of hauling in as many trees as he could each day. Three weeks later, when the cycle was complete, he'd start over. The liberal use of mulch around trees helped their survival, Smith believes. He lost only 14 of the 350 new trees.

As luck would have it, with no more "tricks left," Smith watched as the land that would be Hawk's Nest was pelted by a "nice healing rain."

Finishing up—Because of financial considerations, the front nine had to be opened as soon as possible, midway through the 1993 season. The second nine opened April 30 of this year.

"The longer you have, the better," says Smith. "But somewhere along the line, you have to get the cash register ringing."

The finished course is a beautiful mix of bentgrass, ryegrass and Kentucky bluegrass. The grasses for the tees and USGA greens were chosen by Smith himself.

The greens are Pennlinks bentgrass cut at $\frac{3}{8}$ "—every day. The multiple (4) tees are Penncross bentgrass cut at $\frac{1}{4}$ ". Fairways are a ryegrass/Kentucky bluegrass mix.

Though business was slow at first, since Hawk's Nest opened up to its full 18 holes, it's "getting better every day. We've had nice write-ups in the *Cleveland Plain Dealer*, the *Akron Beacon-Journal* and the local paper, the *Daily Record*," Smith relates.

He and Hawk's Nest are a good pair. Smith is a third-generation golf course superintendent who previously worked at Shaker Country Club, Beechmont Country Club, Acacia Country Club and Pine Ridge Golf Course. He was also a golf car service manager for three years at Baker Vehicle Systems.

"Now the golf course work is starting," he says. "My fear was the unknown; now that it's turf, I'm much more comfortable."

—Jerry Roche



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Non-monetary motivation for golf, athletic field employees

by Sam Crowe
and Craig Conner

Finding ways to motivate your maintenance staff is no easy task. The work can be tedious and monotonous, even at the best of times.

While an assistant or mechanic may be self-motivated, your general staff will often need special reward programs to provide motivation.

Salaries are certainly a major component of any reward system, but research indicates that money is only one of an employee's motivations to work. He or she also wants a sense of importance, autonomy and inclusion.

The following are several suggestions on how the supervisor can create a family atmosphere and motivate his or her staff without using salary increases.

1) Provide a few generous perks such as a free lunch program. This makes employees feel that not only are you paying for them, but you are also providing for them. Meals don't have to be extravagant—sandwiches and chips are enough.

2) If you are a golf course superintendent, you can allow golfing privileges. Your staff will become better educated about the game, and will better understand how to prepare the course for fair play. This program also allows employees a chance to enjoy the fruits of their labor.

3) Another privilege might be allowing employees to use the shop facilities. Access to tools and equipment provides employees with a way to save money on their personal repairs (usually automobile). They may also be able to use the facilities to generate extra income for themselves.

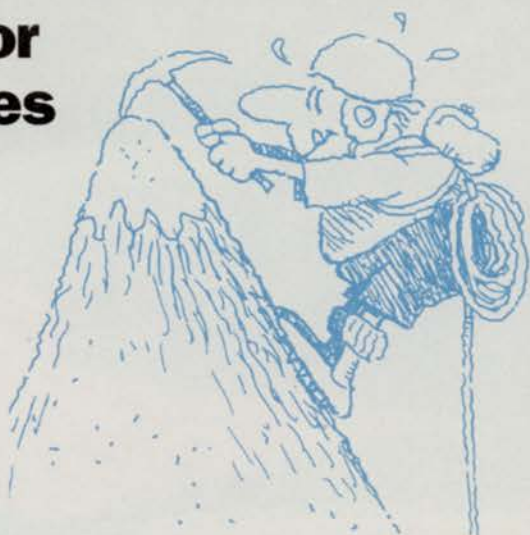
(Keep in mind, however, that this privilege can be abused. It should be carefully monitored.)

4) Parties also provide a good source of motivation and morale-boosting. (Outdoor) maintenance work seems to follow a pattern of periods of high stress followed by periods of dull monotony. A party can provide relief from either the stress or the boredom.

Timing is important to a party's success. It's just as important to break up the monotony of winter equipment repair as it is to celebrate the end of a long, hot summer.

These types of activities don't have to be limited to parties; sporting events and movies are great tension-breakers, too.

5) The suggestion box is still an effective motivational tool. Your staff may discover ways to make their work more efficient, more effective or more fun. The suggestion box provides an outlet for their own ideas—ideas that may improve your organization and also provide the staff



with a sense of autonomy.

6) Another well-tested technique is the Employee of the Month recognition program. Outstanding employees, for instance, can be rewarded with a day off, letting them know that their hard work is noticed and appreciated.

While all these ideas may not be feasible for you, most of them are easy to implement. If you don't like these ideas, try to create some of your own. The result will be a satisfied, productive employee.

—The authors are head and assistant golf course superintendents at Monroe Golf & Country Club, Snellville, Ga. This article excerpted from "Through the Green," the magazine of the Georgia Golf Course Superintendent's Association, May/June, 1993.

10 Golf design considerations to speed play

■ While there are many solutions to slow play, Don Knott, president of the American Society of Golf Course Architects, believes some design considerations should be taken into account. Here are his suggestions, some of which are applicable to superintendents as well as designers:

1) Provide efficient golfer circulation throughout the course. For example, make certain golfers always move off to the sides or behind greens rather than walk back to the front.

2) Clearly mark out of bounds areas to minimize time spent searching for balls in

unplayable areas.

3) Multiple tees equalize the hole's length, help golfers align, and may reduce severity of doglegs and hazards.

4) Greens that are substantially open in the front provide easier access and allow for the run-up shot.

5) Minimize severe undulations in greens [or place pins in areas where undulations won't cause so many three-putts].

6) Mowing patterns can provide a wider landing area for average and short hitters. Narrow landing areas should be located only where appropriate or necessary.

7) The edges of water hazards should be clearly defined and marked for shorter ball searches.

8) Use the lowest possible mower cut for both fairways and roughs. Leave just enough height on the rough to encourage definition and the desired playing characteristics. Trim trees to swing height and reduce brush in high play areas.

9) Fairways should be maintained as containment areas using mounding to retain a slightly errant shot.

10) Accurately mark yardage, including vertical yardage markets for quick identification.

"A well-drained course with ample playable areas, properly placed bunkers, visible water hazards and smaller greens usually plays fastest, Says Knott. "The key is to provide a challenge without overwhelming players."

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13th hole, Spring Valley Country Club, Elyria, Ohio

Working out budget priorities

by Dale Getz

■ Coaches and athletes will always want more field time, and we'll always have more things on our "wish list" than the budget will allow, so cooperation within the University of Notre Dame's athletic department is vital.

For example, the varsity team in the midst of its playing season receives the highest priority on practice field use. In the fall, football and soccer get the prime time for practices. Secondary priority goes to other varsity teams. Club and intramural sports needs are worked into open slots in the scheduling.

Our area of Indiana has a short season for active turf growth. Turf establishment or renovation must be scheduled around field use. Most such projects begin in early spring and are completed by late fall.

I work directly with coaches on day-to-day situations like planning field use and rescheduling rained-out practices or games. Low-cost special requests such as field painting that wasn't originally planned generally can be worked into my



Notre Dame's football field to be lowered two feet by staff of Dale Getz (inset).

budget. Requests that require a large allocation of funds or labor hours are submitted to the assistant athletic director for approval and coordination.

Our coaches appreciate the level of maintenance and high standard of field quality. They notice and understand the effect of adjusting mowing height, over-

seeding, aerating and other procedures. Student athletes, alumni and spectators have also grown to understand the importance of superior sports turf.

I submit three budgets each year: for the football stadium, baseball complex and all other athletic grounds. They break planned expenditures into categories like capital improvements, repairs and maintenance, supplies, utilities, postage and phone.

As the level of play rises, so does the quality of the sports fields. The athletic program and its facilities have grown at the same rate.

We've worked to become more efficient as participation in sports at N.D. has increased at all levels. During the last few years, women's soccer and softball have become varsity sports, creating a need for their share of practice and play time.

To expand field space, we're converting a turfed parking area to practice fields. Also, an artificial turf field has been converted to natural turf.

All of this resulted in a 40 percent increase in the number of turfed sports fields, while my staff has grown by one.

The biggest upcoming project is lowering the football stadium two feet to improve spectator "sight lines," effectively adding 20,000 seats. We will install new drainage and irrigation.

Renovation starts at the end of 1995 season. The field will be ready for play by the 1996 season. Renovation will be completed in 1997.

—Dale Getz is Notre Dame University's athletic facilities manager and active member of the Sports Turf Managers Association.

From the business side...

■ Notre Dame's athletic department contains 40 sub-departments: 16 administrative departments and one for each of the 24 varsity sports. Each sub-department budget is reviewed and submitted to the budget committee for approval in October or November. The fiscal year ends June 30th.

We don't budget money to establish or renovate a field, or for other major projects. Those proposed expenditures must be presented as a formal plan.

We prioritize project requests to establish the top 10 according to the total goals of the department and the University. This list is presented along with the standard budget requests.

We show 10 special requests, but seek funding for the top four or five. This lays the groundwork for the following year's requests. For example, because women's soccer recently became a varsity sport, we may show a new soccer field as fourth on the list, and bleachers for that field as eighth. This spreads out a \$200,000 project into workable segments, rather than asking for everything at once. Budgets are approved in April or May.

Funds and endowments can be desig-

nated for athletics by contributors through the central development office, creating an area we can tap for smaller special projects. All management personnel and coaches in the athletic department are available to answer questions, show the facilities and explain needs in further detail to potential donors.

Dale Getz reports directly to me on major issues. The coaches report to the assistant athletic directors. Priorities are set by the administration. This helps us properly manage intra-department needs.

The easiest way to have good athletic fields is to have great people and rely on their judgement. Sports turf management takes the ability to coordinate the complex interaction of science and "art." Dale has the expertise to get and keep the fields in shape and the knowledge of what's best for each field and its turf. Just as the athletic trainer has the final call as to whether an athlete can play, Dale has the final call on whether or not a field can be used.

—The author, Bubba Cunningham, is athletic department business manager for the University of Notre Dame.

Winterizing landscapes

Mulching, pruning and barricading are as important in the war against winter as in the battle against summertime problems.

■ The severe winter of 1993-94 damaged many landscapes across the Midwest.

"The record-breaking temperatures, deep snow and ice storms took their toll on almost everyone's landscape," says Dr. J. Robert Nuss, professor of ornamental horticulture in Penn State's College of Agricultural Sciences.

"The deep snow provided some insulation, but many plants still were not hardy enough to withstand the cold."

During the past decade of mild winters, many homeowners planted broadleaf evergreens and other plants that couldn't stand the cold. Leaf and flower buds and stems and branches were all destroyed.

"Some marginally hardy plants were killed down to the soil line, even though they were protected by snow," says Nuss.

The best way to plan for a hard winter is to protect the plants. Here are

some tips from Charles Owen, formerly with the Holden Arboretum, Mentor, Ohio, now horticulturist at the Cleveland Metroparks Zoo:

Mulching—Mulch is the best thing you can do for landscape plants. It helps moderate the soil temperature and moisture, which reduces the chance of injury by desiccation. Keep the soil cool a bit longer in spring, to delay bud break and thus avoid damage from a late frost.

Mulch will also reduce frost-heaving, which is caused by the soil freezing and thawing alternately. Frost-heaving occurs mostly with herbaceous material planted in the fall.

Organic material is preferable for mulching, but must be replaced every few years.

Apply mulch to a uniform thickness over the entire bed or under the drip line of trees. The thickness of the layer depends on the material, but 2 to 3 inches is right for most material. Use less if you are using something that mats down, like fresh leaves or lawn clippings, and more if you use fluffy material, such as straw.

Inorganic materials—black plastic, stone or other landscape fabrics—don't moderate changes in soil temperature as well as organ-

ic mulches do.

Whichever mulch you use, pull it back from the stem or crown of plants. The moisture-retaining properties of mulch can otherwise be fatal, as rots and molds can enter at the crown if this area is too wet.

Pruning—A severe form of weather-related plant damage is breakage caused by wind, snow and ice. Winter breakage occurs mostly on evergreen plants, especially large ones with a flat-topped, spreading habit.

Deciduous trees are often broken up by the wet snows sometimes seen in November.

You can greatly reduce breakage in the long run by pruning young trees so they grow to be pyramidal. Also, prune branches with weak mechanical attachment, such as narrow crotches.

On older trees, and trees that will not grow in pyramidal manner, cabling and bracing are the only way to reduce damage from ice and snow. You can create wind breaks in order to reduce breakage throughout the year.

Winter injury is also caused by ice that forms inside plant tissue. This is seen most often after spring freezes and frosts, as plants come out of dormancy. The best advice in this case is to select and place plants properly.



Advice for the mountain zone

■ "I don't think the Midwest has to irrigate during winter, but here, we have to make sure soil is moist and plants are hydrated," says Bill Carlos, horticulture program coordinator for the cooperative extension in Reno, Nev.

"Plants continue to lose moisture through their leaves, particularly evergreens. If we get a real dry winter, they will experience winter desiccation, as well as heaving and thawing of root ball; you have to insulate the soil with a three-inch layer of mulch."

Overnight lows in northern Nevada can descend to 10°F. or colder, depending on the winter. On any winter day, the temperature might fluctuate between 60° above to 30° below.

If you're in Colorado, northern Utah, Idaho or northern Nevada, read on:

✓ Select and plant cold-hardy trees and shrubs, adapted to inorganic, alkaline soils and a hot, dry climate.

✓ Select plants for their snow tolerant architecture: low, spreading habit and strong wood.

✓ Break up caliche (calcium carbonate) layers and hardpans prior to planting.

✓ Amend light and heavy soils with organic matter before planting.

✓ Mulch around the base of plants.

✓ Locate plants to avoid freezing, drying, winter winds and direct sun.

✓ Locate plants away from areas where snow accumulates or is piled up.

✓ Provide winter protection, if plants are exposed.

✓ Maintain plants in good vigor during the growing season.

✓ Replenish soil moisture before the ground freezes, but after the plants have gone dormant.

✓ Don't irrigate excessively, prune or fertilize late in the season. Let plants go dormant.

WINTERIZING LANDSCAPES

Winter pests

- Mice, rabbits, and deer take over in winter as insect pests lie dormant.

Mice and rabbits eat the cambium, the living tissue just under the tree bark. Look for this injury on low-growing shrubs, especially evergreens, and on young fruit trees.

If the cambium is removed from the entire perimeter—called girdling—everything terminal to the girdled site loses contact with the root system and dies.

So when the trunk is girdled, the tree's entire top dies.

Deer damage plants in two ways. First, they eat twigs, buds and leaves. Although this is annoying because it can deform landscape plants, the damage usually is not fatal.

The second type of deer damage is worse and sometimes lethal. When bucks rub their antlers on tree trunks, the cambium is destroyed. It takes several years for the tree to grow new tissue, but the bucks often return to rub the same

trees year after year.

Snow fences, chicken wire, hardware cloth or other fabrics can help protect plants from these hungry marauders, but they'll only work on individual plants. Deer can clear fences, and other animals can burrow under them.

—Charles Owens, the
Holden Arboretum,
Mentor, Ohio



Shrub damage caused by hungry deer. Holden Arboretum

WINTERIZING LANDSCAPES

A new whey to de-ice

- Salt used for de-icing roads and sidewalks causes conifer needles along some of the nation's

most scenic byways to turn brown. Around the home or beside well-landscaped parking lots, dissolved salt washes into the soil and can cause nearby trees to slowly die.

The good news is that researchers are trying to find ways to economically ferment cheese whey to produce calcium magnesium acetate, an effective and apparently harmless de-icer.

The *Wall Street Journal* says 20 billion pounds of whey are poured down the drain annually as waste. When perfected, however, the calcium compound will probably sound expensive to city officials. At a projected cost of \$300 per ton, it will seem to compare unfavorably to cheap salt, which sells for only about \$30 per ton. That is, until the aggregate damage from salt is calculated—a cost that some studies suggest required up to \$1000 per ton to rectify.

—National Landscape Association News

Take-all patch springs up on Southern golf courses

A disease that appears to be either brown patch or grub damage, but upon closer inspection is not.

By James E. Guyette

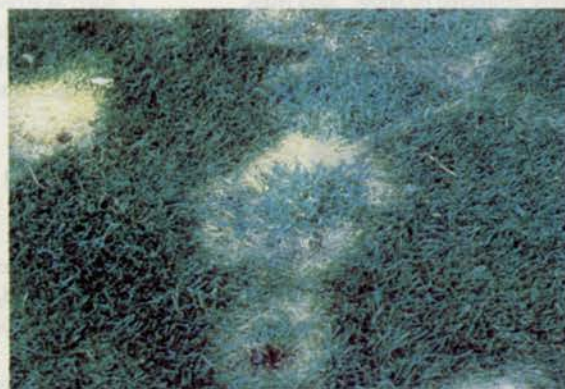
■ A relatively new turfgrass disease called take-all patch has been attacking St. Augustine and bermudagrass in Florida, Alabama, Texas and throughout the Gulf Coast states. The damage this fungus causes is similar to that of brown patch.

"Take-all causes costly damage to parks and golf courses, as well as to commercial sod farms," says Dr. Janell

Johnk, Texas A&M extension specialist, Dallas. It hits home lawns, too.

"Left untreated, the damage increases year-to-year, and ultimately it destroys an entire lawn or field," Johnk notes. "St. Augustine seems to be sustaining greater damage than bermudagrass. It's cropping up wherever grass is found," she adds.

Dr. Joe Krausz, Texas A&M plant pathologist, College Station, first identified take-all in Texas in 1991. The culprit is the fungus *Gaeumannomyces graminis* var. *graminis*. This same fungus is one of the three that cause spring dead spot in bermudagrass. "It's probably been here a



Take-all prefers alkaline soils.

long time, but we're probably just learning about it now," Krausz explains. "In the past, they would probably scratch their heads and attribute it to other things.

"The fungus prefers alkaline (high pH) soils. We're studying that now. It may be our mild winters have let this soil-borne disease get a foothold in
continued on page 36



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Circle No. 115 on Reader Inquiry Card

continued from page 34

become as severe as it is this year. And once you've got it, it's a real problem," says Krausz.

"The damage approaches epidemic proportions across the state, except for the desert areas," says Johnk. "Unfortunately, this fungal disease imitates brown patch and grubworm damage. What we use to treat for grubworms, for instance, has no effect on this disease. On the other hand, the appropriate chemicals to control take-all work on brown patch, but some chemicals for brown patch are not labeled for take-all."

The two fungicides labeled for take-all are fenarimol (Rubigan) and tridimefon (Bayleton). The best defense against take-all is a strong stand of turf. "It's a long-term management thing," says Krausz.

The best time to apply fungicides is in the fall, when the rainy season starts and evening temperatures dip to below 70°F. Local conditions usually help with timing.

"Don't use a fungicide unless you're sure that you have take-all, and then only at the right time—in the fall," says Johnk.

Adds Krausz: "These fungicides are most effective as preventive treatments and much less effective as curative treatments after the disease is established."

This disease is characterized by large irregular patches of dead turf, often ranging from a foot to several yards in diameter. Affected areas show irregular patterns as individual spots merge or as the disease subsides temporarily and weeds fill thinned areas.

Most visible in early spring and summer, damage usually occurs following stress, such as the first hot, dry days or after applying a quick-release fertilizer.

While take-all patch can be mistaken for brown patch or grub worm damage, a close look reveals several distinguishing factors. "It's a root rotter," Krausz explains. Entire stolons may be lifted easily from the turf. Once the roots are destroyed, they don't recover. Re-growth has to come from the unaffected edges of the diseased patch or new sod.

Brown patch, on the other hand, doesn't affect the roots, and the turf recovers when warm weather arrives. With brown patch, the base of the leaf

sheath is often slimy and rotted and the leaf pulls from the rest of the plant with a gentle tug. Although white grub damage looks similar on the surface, grubs will be found in the soil. Also, grub-damaged roots don't appear rotted.

"Turfgrass with a vigorous root system resists the damage from take-all patch fungus," says Johnk.

Recommended procedures to deal with the disease:

- Eliminate areas where water accumulates in low spots.
- Water only when needed. Infrequent but thorough watering is best.
- Use fertilizers that lower the soil pH, such as ammonium sulfate. Fertilize the last time in early September if nitrogen is needed, taking into account local climate conditions.
- Prevent thatch and aerate to alleviate soil compaction.
- Preventive fungicide treatments in the fall should be repeated for at least two years.

—The author, former editor of Lawn Care Industry magazine, is a frequent contributor to LM.

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HOT TOPICS

Expo, conferences take spotlight in St. Louis

ST. LOUIS—It all comes together for three green industry organizations here Nov. 13-17.

The Professional Lawn Care Association of America (PLCAA), the Associated Landscape Contractors of America (ALCA) and the Professional Grounds Management Society (PGMS) will each have annual meetings and conferences concurrent with the fifth annual Green Industry Expo, the green industry's second-largest trade show (after the GCSAA show). More than 300 exhibitors will occupy more than 500 booth spaces.

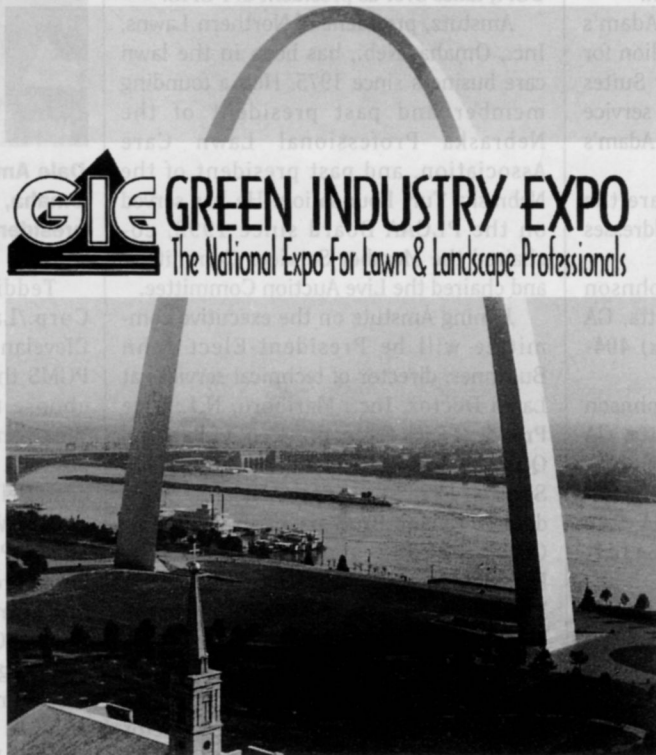
"Booth sales are right around 90 percent of being sold out. We're in a much bigger hall this year, so compared to previous shows we're on a very good pace," says Eleanor Ellison, who was hired in January as the GIE's first full-time trade show manager. "We expect this to be a sell-out as well."

GIE/94 goes by the tag line "The National Expo for Lawn & Landscape Professionals." It will be held at America's Center convention center.

The PLCAA conference will feature seminars on business, regulatory and turf/plant technology, along with a complimentary President's Reception and Casino Night.

ALCA's theme is "Competing in a Dynamic Economy...Growth Over the Horizon." More than 500 members are expected to attend the Expo and 14 ALCA educational sessions.

"The ability to network with peers, dis-



cuss current technology and view state-of-the-art products is worth the price of admission," says Russell Adsit of Adsit Landscape and Design, Memphis, Tenn. "If you miss this one, you just miss out, since there is not another conference and trade show like it anywhere."

The PGMS conference has been dubbed "The Gateway to Professionalism." Some of the speakers are Dr. Dave Minner of the University of Missouri, representatives of the Davey Tree Co., Bill Foster of O.M. Scotts and Rob McCartney of Sea World of Ohio.

"We have purposely geared the conference to the stated needs of grounds man-

agers, and have balanced the program to be of equal value to everyone," says PGMS president Robert F. Rubel.

Here are some other highlights:

- **Inspirational keynote speech by football great Rocky Bleier.** The former Pittsburgh Steeler was wounded in Vietnam and went on to become a member of the Super Bowl champion Steelers in the 1970s. His talk, "Being the Best You Can Be," is Monday, Nov. 14 from 2:30 to 3:45 p.m.

- **Trade show sneak preview and reception.** Following Bleier's speech, you can mingle with friends and get an advance look at the trade show itself, 4 to 6 p.m. Nov. 14.

- **Two days of exhibits.** The hall will be open Tuesday and Wednesday, Nov. 15-16 from 10 a.m. to 4 p.m.

- **\$500 grand prize drawing.** The drawing will take place at 3 p.m. on Wednesday, Nov. 16—and you must be present to win.

- **GIE Theater.** A series of informative video workshops is being provided by exhibitors and screened by GIE show management. Free popcorn!

- **New product showcase.** Literature holders located at the entrance to the exhibit hall.

- **Equipment demonstrations.** The popular Outdoor Equipment Demonstration will be held Nov. 17 from 9 a.m. to noon at Cricket Field in Forest Park. Complimentary shuttle service is available,

ELSEWHERE

Amstutz, Chapman lead PLCAA, PGMS page 38

Artificial turf: it comes and goes, page 38

Penn State gets new turf museum, page 39

Words of wisdom from our readers, page 41

and food and beverage is provided.

A special pre-conference seminar and tour will be held at the Missouri Botanical Garden on Sunday, Nov. 13. Sponsored by the Professional Lawn Care Association of Mid-America (PLCAMA), it will feature Dr. John Kaufmann of Monsanto speaking on "Green Lawns and Global Issues." Registration fee of \$55 for PLCAA members and \$70 for non-members includes brunch, program, tour and tram ticket. Transport provided by DowElanco from the Adams Mark Hotel to the garden.

Headquarters hotels are the Adam's Mark for PLCAA, the Marriott Pavilion for ALCA and the Doubletree/Mayfair Suites for PGMS. Complimentary shuttle service to America's Center will serve the Adam's Mark and Marriott Pavilion.

For more information, here are the organizations involved and their addresses and phone numbers:

GIE Exhibitors: GIE, 1000 Johnson Ferry Rd., NE, Suite C-135, Marietta, GA 30068; (voice) 404-973-2019; (fax) 404-578-6071.

GIE Information: GIE, 1000 Johnson Ferry Rd., NE, Suite C-135, Marietta, GA 30068; (voice) 404-973-2019; (fax) 404-578-6071.

Botanical Garden Tour: PLCAMA, P.O. Box 419264, Kansas City, MO 64141; (voice) 816-561-5323.

ALCA Registration: ALCA, 12200 Sunrise Valley Dr., Suite 150, Reston, VA 22091; (voice) 703-620-6363; (fax) 703-620-6365.

PGMS Registration: PGMS, 120 Cockeysville Rd., Suite 104, Hunt Valley, MD 21031; (voice) 410-584-9754; (fax) 410-584-9756.

PLCAA Registration: PLCAA, 1000 Johnson Ferry Rd., NE, Suite C-135, Marietta, GA 30068; (voice) 404-977-5222; (fax) 404-578-6071.

Amstutz to lead PLCAA; Chapman heading PGMS

ST. LOUIS—The Green Industry Expo here Nov. 13-17 signals new leadership for the Professional Lawn Care Association of America (PLCAA) and the Professional Grounds Management Society (PGMS).

Dale Amstutz becomes the 15th president of PLCAA, while Steven W. Chapman, CGM, takes over as president of PGMS.

Amstutz, president of Northern Lawns, Inc., Omaha, Neb., has been in the lawn care business since 1975. He's a founding member and past president of the Nebraska Professional Lawn Care Association, and past president of the Nebraska Turf Foundation. He has served on the PLCAA Board since 1992, co-chaired the Member Services Committee, and chaired the Live Auction Committee.

Joining Amstutz on the executive committee will be President-Elect John Buechner, director of technical services at Lawn Doctor, Inc., Marlboro, N.J.; Vice President Dick Ficco, president of Partners Quality Lawn Service, Inc., Easton, Mass.; Secretary/Treasurer Steve Hyland, president of Hyland Brothers Lawn Care, Fort Collins, Colo.; and Immediate Past President Lou Wierichs, Jr., president of Pro-X Systems, Fox Cities and Green Bay, Wis.

Mike Dietrich, director of lawn care sales at Lesco, Inc., Rocky River, Ohio, was elected to the Board as associate director and PLCAA's associate representative on the Green Industry Expo Board.

Chapman is grounds manager for Digital Equipment Corp. of Salem, N.H. A past PGMS treasurer and member of the board, he's also been active in the New England branch.



Dale Amstutz of Northern Lawns Inc., Omaha, Neb., is the PLCAA's new president.

Teddi Davis, vp of sales for Garick Corp./Landscape Wholesale, Inc. of Cleveland, will be first vice president of PGMS this coming year. Membership will choose from Doyle Watson and Steve Wharton for the second vice president position. Watson is landscape superintendent, Belle Meade Country Club, Nashville, Tenn. Wharton is staff horticulturist, Minot Park District, Minot, N.D. The PGMS treasurer will be Jeffrey A. Bourne, director of parks and recreation for Howard County, Md.

George Van Haasteren, Jr., CGM, is the new Northeast Regional Director. He's grounds manager of Dwight-Englewood School, Englewood, N.J. The Southwest Regional Director will be Randy Willis, CGM, grounds supervisor at Northwest Missouri State University. Mark Nettleship, who will continue as Director at Large, is ground supervisor of a large Baltimore apartment complex.

Artificial turf: it comes and goes

EAST LANSING, Mich./KANSAS CITY, Mo.—Every new football season sees some artificial turf fields come and some go. It's no different this season.

World Cup soccer was played on a turf-grass surface inside the Pontiac Silverdome in July. By most accounts, the first-round games just north of Detroit delighted millions of viewers worldwide.

At East Lansing though, MSU will be replacing the artificial turf at its football stadium with—you guessed it—artificial turf. MSU has decided to lower the football

field about six feet and cover it with a new synthetic turf surface.

"George Perles (MSU head football coach) still runs the football field," says a spokesman there. "He says it's not in the best interest of the student body to have grass in there like at Michigan (University) where it's only used seven times a year, for six home games and graduation. The MSU Stadium football field was used 150 times last year, for bands, soccer, and field hockey too. The facility gets maximum use."

But, according to an Associated Press

story, the Kansas City sports teams will have natural grass to play on by baseball season 1995. The Chiefs converted Arrowhead Stadium to natural turf this season, and the baseball Royals will switch to grass at Kauffman Stadium in 1995. Both fields are part of the Harry S. Truman Sports Complex in the eastern portion of Kansas City.

According to the AP report, Chiefs president Carl Peterson said the decision to switch was based on "improved drainage techniques, technological advances in grass systems and other uses for Arrowhead."

HOT STUFF

Penn State dedicates new turfgrass museum

UNIVERSITY PARK, Pa.—Penn State University dedicated its new turf museum to Tom Mascaro and Eberhard Steiniger in ceremonies during the Penn State Turfgrass Field Days in August.

The 40,000 sq.ft. museum displays many of Mascaro's and Steiniger's inventions. It is the conception of retired turfgrass professor Dr. Joe Duich.

Mascaro was president of West Point Products for 55 years before founding Turf-Tec International with his son John in 1986.

Steiniger was superintendent at Pine Valley Golf Club in Clementon, N.J. for 57 years. He is known for converting a sand waste layout with only scrub pine into the No.1 golf course in the world.



Tom Mascaro



Eberhard Steiniger

New, easy lending program from SBA

WASHINGTON—The U.S. Small Business Administration (SBA) has a new lending program that allows small businesses to borrow up to \$100,000. The SBA's Low Documentation Lending Program (LowDoc) has a one-page application that depends on a lender's experience and judgement in granting small business loans. For more information, contact the SBA district office in your state, or call the SBA's Washington answer desk at (800) 827-5722.

New name for sod producers: TPI

ROLLING MEADOWS, Ill.—Members of the American Sod Producers Association (ASPA) unanimously voted to change the name and logo of the 27-year-old organization to Turfgrass Producers International (TPI) at their summer convention in Newport, R.I. The new name, members agree, better represents the growing international membership. 227 of the organization's 940 members are from outside the U.S.

Business notes...

...**Arden Jacklin**, 82, a co-founder of **Jacklin Seed Co.**, passed away over the summer in Spokane, Wash. The highly-respected former president of Jacklin Seed was also director of the American Seed Trade Assn. and past Lawn Seed Division Chairman. He was named 1982 Honorary Member of the ASTA. News of his death arrived in the LM editorial offices too late for the August issue...

...**Karen Plumley** will earn her Ph.D. in turfgrass pathology from Rutgers University this fall after receiving more than \$50,000 in financial support from the **Peter S. Loft** Scholarship Fund...

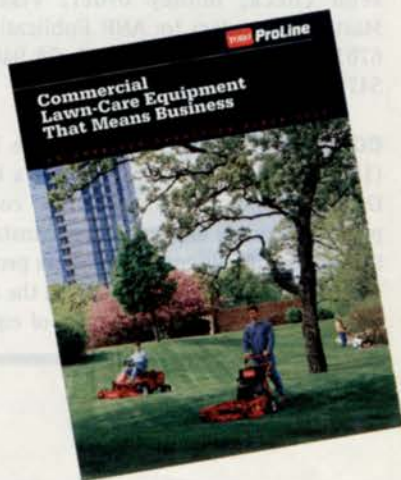
...**George Hamilton Jr.** was awarded the "Innovator of the Year" award by the North East Weed Science Society for developing and patenting the PennPro Collector, the first device to make spreader calibration easy and accurate...

...**AgrEvo**—a world-wide joint venture between Hoechst AG, Frankfurt, and Schering AG, Berlin—becomes the second-largest agricultural chemicals marketer in the world. In North America, the crop protection operations of AgrEvo will be composed of **Hoechst-Roussel Agri-Vet**, Hoechst Canada and **Nor-Am Chemical Co.**

...**Neal Howell** will develop a new micronutrient fertilizer for **United Horticultural Supply**. UHS will work with Howell's company, Key Solutions, to develop and market the products. Howell was instrumental in developing micronutrient fertilizers for **PBI/Gordon** and **Lesco**...

...The Stadium Managers Association has named **Dakota Peat** its official organic material, and awarded Dakota Peat an exclusive national contract to supply members.

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Landscape Management, October 1994 39

INFO CENTER

Useful literature and videos for the green industry

FOR PESTS...The University of California has released "Pests of Landscape Trees and Shrubs," an integrated pest management guide authored by Steve H. Dreistadt and edited by Mary Louise Flint. The book was prepared under the auspices of the university's Statewide IPM Project, directed by Frank G. Zalom. Its 328 pages include hundreds of four-color photos and charts. Cost of \$32 includes applicable taxes, shipping and handling. To order, phone (510) 642-2431 and ask for Publication 3359. Or send check, money order, Visa or MasterCard orders to: ANR Publications, 6701 San Pablo Ave., Oakland, CA 94608-5470.

CONSTRUCTION ESTIMATES...The 14th (1994) edition of the book "Kerr's Cost Data for Landscape Construction" covers per diems, crew and equipment installation and materials costs. Tables are provided for calculating everything from the area of a work site and the quantity of equip-

ment needed on a particular job to the spread of plant roots. Software and estimating worksheets are included. Cost for the 224-page paperback is \$49.95. For more information, write Van Nostrand Reinhold, 115 Fifth Ave., New York, NY 10003 or phone (212) 254-3232.

IRRIGATION MANUAL...Weather-Matic has released the "Turf Irrigation Manual, Fifth Edition" by Richard B. Choate. The step-by-step instruction manual contains new ways to calculate hydraulics, a practical discussion of irrigation methods and efficiency, and new designs. It sells for \$49.95 and is available from the GCSAA (800) 472-7878; the American Society of Landscape Architects (800) 787-2665; and the Irrigation Association (703) 573-3551.

PROTECTION STANDARDS..."Meeting Worker Protection Standard Guidelines" is designed to help nursery professionals comply with the new Worker Protection

Standard (WPS) requirements. The 11-page guide gives nursery professionals compliance dates and new WPS requirements. DowElanco offers the guide free to nursery professionals who call (800) 352-6776. Ask for WPS form #301-00-030.

NEW IRRIGATION..."Advancing the Science of Irrigation" is a new video on design, installation and maintenance of a Techline subsurface drip irrigation in the landscape. To order the free video, call Liz Maxwell, Techline Customer Service: (209) 498-6880.

TREE CLIMBER ART...A limited edition print of a watercolor by Todd Moell depicts the tree climber at work. "Tree Climbers: The Strength of the Industry" is available from the International Society of Arboriculture. It costs \$50 for members. Write the ISA, P.O. Box GG, Savoy, IL 61874; or call (217) 355-9516. Visa/Master Card accepted.

GREEN INDUSTRY EVENTS

What's going on in the industry

NOVEMBER

3-4: Washington Association of Landscape Professionals State Conference, Bellevue. Phone: (206) 236-1707.

3-4: South Carolina Urban Forestry Conference, Fort Mill. Phone: Clark Beavans, (803) 329-5534.

3-5: California Landscape Contractors Assn. Annual Convention. Phone: CLCA, (916) 448-2522.

5: Iowa Sports Turf Managers Assn. meeting, Atlantic, Ia. Phone: (515) 791-0765.

6-9: National Institute on Park & Grounds Management, Orlando, Fla. Phone: (414) 733-2301.

6-9: Irrigation Assn. International Exposition and Technical Conference, Atlanta. Phone: IA, (703) 573-3551.

7: California Certified Nursery Professional exam, San Ramon. Phone: CAN, (916) 567-0200.

7-9: Kentucky Turfgrass Conference, Louisville. Phone: Kentucky Turfgrass Council, (606) 622-2228.

8-10: Penn State Golf Turf Conference, University Park. Phone: (814) 863-1017.

8-11: Oklahoma Turf Conference, Oklahoma

City. Phone: Oklahoma Turf Research Foundation, (918) 251-4868.

8-11: New York Turf & Grounds Exposition, Rochester. Phone: NYSTA, (518) 783-1229.

11: Landscape Maintenance Assn. Equipment & Supply Show, West Palm Beach. Phone: (813) 680-4008.

11-12: Golf Course Expo, Orlando, Fla. Phone: (207) 846-0600.

12-13: John Deere Team Championship Golf Tournament, La Quinta, Calif. Phone: by invitation only.

13-17: Green Industry Expo and annual conferences for Professional Lawn Care Association of America, Associated Landscape Contractors of America and Professional Grounds Management Society, St. Louis, Mo. Phone: PLCAA, (404) 977-5222; ALCA, (703) 620-6363; PGMS, (410) 584-9754.

16-18: Composting Council Annual Conference, Washington, D.C. Phone: The Composting Council, (703) 739-2401.

17: California Certified Nursery Professional exam, Anaheim. Phone: CAN, (916) 567-0200.

17-19: Tree Care Industry Expo, Philadelphia, Pa. Phone: National Arborist Assn., (603) 673-3311.

17-20: International Golf Show, Madrid,

Spain. Phone: (011) 34-1-350-1564.

18-20: Golf Summit '94, Scottsdale, Ariz. Phone: National Golf Foundation, (407) 744-6006.

19: Women in Horticulture Conference "Profiting from Integrity," Seattle. Phone: (206) 525-7844 or (206) 937-2815.

22: Alliance for Environmental Concerns Annual Meeting. Phone: AEC, (201) 595-7172.

28-29: Southern Turfgrass Association Annual Conference, Memphis, Tenn. Phone: (913) 749-5885.

28-30: North Central Turfgrass Exposition, St. Charles, Ill. Phone: Illinois Turfgrass Assn., (312) 616-0800.

28-30: Southern Turfgrass Assn. Conference and Show, Memphis, Tenn. Phone: (901) 749-5885.

29: "Practical Approaches for Effective Erosion and Sediment Control." Orlando, Fla. Phone: International Erosion Control Association, (303) 879-3010.

29-Dec. 1: Rocky Mountain Turf Conference & Trade Show, Denver. Phone: (303) 688-3440.

29-Dec. 1: Golf Course Europe, Paris, France. Phone: (510) 526-6922; (510) 526-5387.

29-Dec. 1: New Jersey Turfgrass Expo, Atlantic City. Phone: (908) 821-7134.

U SAID IT!

I remember when you could service the heck out of the customer, replace dead plants, take him to a ballgame, send his wife flowers for her birthday and still achieve 10-12 percent net profit. Those were the days.

Then came the '90s. Reputation, quality and service don't mean much more any more.

Tommy Aiello
*Master Gardeners Nursery
Delray Beach, Fla.*

The industry had better wake up and acknowledge the fact that 90% of the population of the U.S. does not play golf, and that golf is perceived as an elitist, non-essential, polluting, resource-wasting despoiler of the environment by a large percentage of non-golfers.

Vice President Al Gore and EPA Director Carol Browner are still lacing up their boots. I fear a heavy footprint will yet be tread upon the golf industry by these two before they leave office.

Mark Jarrell
*Palm Beach National C.C.
Lake Worth, Fla.*

I still love to watch seeds sprout and cuttings root. I wouldn't swap this for the world. I would, however, trade it for a cashier's check with lots of zeroes.

Denise Smith
*GardenSmith
Jefferson, Ga.*

Every ladder has a bottom rung. Shouldn't we as the professionals be more worried about educating [beginners] on the right way? I don't believe the ones who stick it out long enough to get up the ladder will forget those who slighted them on that long, hard climb.

Tammy Clayton
*Clayton Landscaping & Nursery
Detroit, Mich.*

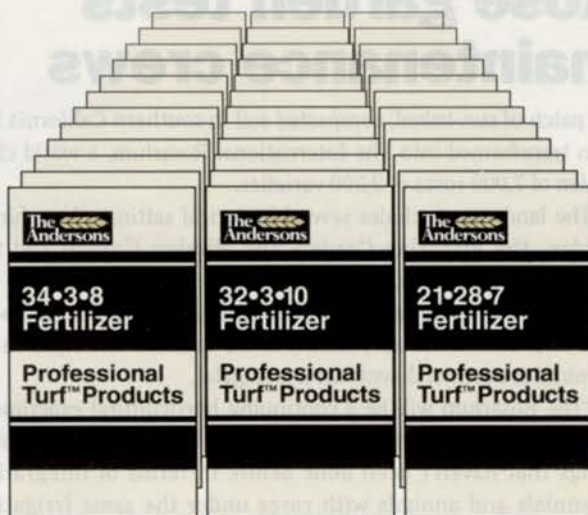
One of the challenges that superintendents in the U.S. face is that they're constantly striving to be the best. I think our courses are the best in the world: you get the fairest lie, year in and year out, on some of the higher maintained courses. America was built on the challenge of people doing better, and there being incentives for doing just that. Superintendents need to look at it from that perspective.

Brad Kocher
*Pinehurst Country Club
Pinehurst, S.C.*

My cardinal rule of marketing: if you spend your time with a client, charge a fee. You don't need to act desperate for money, but charge for every step.

Joel Lerner
*Lerner Environmental Design
Chevy Chase, Md.*

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Circle No. 101 on Reader Inquiry Card

Landscape Management, October 1994 41

JOB TALK

Rose garden tests maintenance crews

■ A patch of sun-baked, compacted soil in southern California has been transformed into The International Rosarium, a world class garden of 7,000 roses of 2,200 varieties.

The landscape includes several historical settings, Josephine's Garden, the Victorian Garden, the Mission Garden and the Edwardian Tea Garden.

The five-acre Rosarium opened in May within the 165-acre Descanso Gardens botanic facility at La Canada Flintridge, Calif., 20 minutes north of downtown Los Angeles.

"The Rosarium will be a continuing horticultural experiment for us," says Dr. Steven Cohan, director of Descanso. "We're doing things that haven't been done before in terms of integrating perennials and annuals with roses under the same irrigation regimes, fertilizer programs and pest control."

The Rosarium is located on the site of a once-thriving rose garden developed by former rose hybridizer Dr. Walter Lammert. The Descanso Gardens Guild, a non-profit group, obtained private funding as the second phase of the garden's master plan. Construction began in October 1993 and was completed last May.

"We had a nine-foot layer of compacted clay soil," says Cohan. The roots of the old roses had gone down only a foot and a half before spreading laterally. Much of the soil had eroded as well.

To enhance root development, the hard pan was cultivated to a depth of 30 inches, and nitrogenized fir bark was added at a rate of 4 cu. yds./1000 sq. ft., and 8 lbs./1000 sq. ft. of 12-8-8 controlled release fertilizer was spread in the cultivated soil. Some 12-8-8 slow release Gro Power tablets were placed within two inches of the rootballs of all shrubs and trees at the rates of two per 1-gallon planter, seven per 5-gallon planter, 13 in a 15-gallon planter, and 16 per 24-inch box. Urea- and organic-based fertilizers with 8- to 12-week feeding periods were tested for suitability over the summer.

Irrigation—Four types of delivery systems are used to irrigate the gardens. Low-volume overhead sprayers are used for turf areas; micro-sprayers for the rose companion plantings, underground soaker lines for hedges, and drip emitters for trees, shrubs and roses.

The clay soil requires less water. "We're able to get phenomenal growth in our roses on the drip system with only a gallon of water a week during the first two months after the spring planting," says Cohan. "The recommendation by rosarians is 10 to 12 gallons a week when the roses are in their growing season. With the drip system, the water percolates down slowly, and the clay



An oil funnel over the end of the spray wand makes for easy, drift-free applications of Roundup.

holds the water near the roots."

Battling nutsedge—The turf in the Rosarium is Bonsai dwarf tall fescue, which is a good choice for heat tolerance and low mowing adaptability, according to Cohan.

"The fescues have a deep root system which reduces stress and enables faster recovery than blue or rye," says Cohan.

Then the nutsedge showed up. It's a weed that can quickly overtake a turf stand if left untreated.

Frank Madero, pest control advisor for American Landscape Maintenance, Inc.—consultants to Descanso Gardens—called in Dr. Nelroy Jackson, a product development specialist with the Monsanto Co. They realized Roundup would cause bare spots in the turf, so Jackson suggested treating the turf with Manage, Monsanto's new selective herbicide for nutsedge control. Manage was applied to the turf under an Experimental Use Permit. Within one week the problem was brought under control, with no damage to turf.

Ingenuity—Nutsedge was also visible in the bare soil surrounding the roses and companion plants. The crews were able to use Roundup in the bare soil, but they needed a safer way to apply it once the winds kicked up at about 9:30 in the morning.

"We took an oil funnel and fit it over the end of the spray wand, and now we can just put the cone right over the nutsedge plant and give it a little squirt," Madero says.

The problem will not go away all at once, however. "Even with the Manage eventually being labeled for use with Roundup," says Madero, "the nutsedge will be here for a few years because of all the nutlets already in the ground that will germinate. But we think we have the problem under control."

To reduce insect damage, Cohan is considering using newly-devised sun oils, natural insecticide soaps and predatory insects that feed on bugs that are harmful to vegetation.

"Between the 150 bird species and beneficial insects inhabiting the garden, things should pretty well come into balance," predicts Cohan. "We'll see if we can pursue that with the diversity of plant material in the rose garden."

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GREEN INDUSTRY SHOWCASE

Easy-to-use package for Dutch elm fungicide

Ciba Turf & Ornamental Products has repackaged its Alamo fungicide for oak wilt and Dutch elm disease, making it easier to use and less expensive to apply.

The new micro-injection system consists of individual 10 mm Alamo units that are easily inserted into a tree's flare roots. A light tap from a hammer activates a plunger and releases the fungicide into the tree.

Alamo is water-soluble, so it translocates readily throughout the tree.

"The micro-injection units save six to seven hours in labor over previous application methods," says Jerry Osborne, Alamo product manager. "Plus, a new pricing structure has lowered the overall cost of Alamo, making the product much more economical to use."

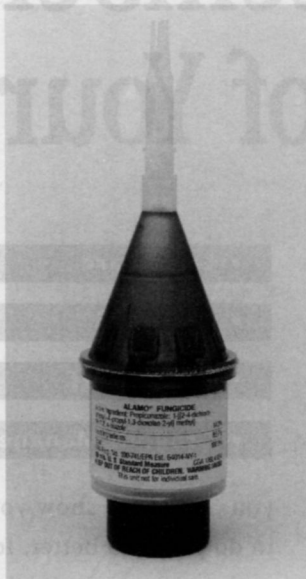
The Alamo capsule is made of clear plastic, and the bluish-colored fungicide is easy to see.

A plastic bag is included for disposing of empty capsules.

The company reports that Alamo is most effective when used as a preventive. As a post-emergence treatment, it will prolong the life of trees with as much as 20 percent crown loss.

Apply Alamo after a rainfall, when the tree is in leaf.

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



This engine features easy- service outboard starter

Ryobi commercial trimmers feature the company's advanced 4-cycle engines. The new engine features an outboard starter that's easy to service.

The engine is used on the 2065r and 2085r commercial-grade trimmers, available for consumer purchase in 1995.

Both models cut an 18-inch path, have solid drive shaft and heavy duty clutch for longer life, and a padded shoulder strap.

The 2085r comes with an eight-inch brush blade and an isolated bicycle handle bar with the throttle on the handle.

The 2085r is \$299; the 2065r is \$269.

Circle No. 194 on Reader Inquiry Card

Insect growth regulator stops ornamental pests

Precision is a new insect growth regulator for use in landscape ornamentals, container grown ornamentals, non-bearing fruit and nut trees in nurseries.

Precision is a product of Ciba Turf & Ornamental Products.

Precision affects insects' life cycles during transitional phases when they normally change from egg to larva, larva to pupa, and crawler to settled scale.

Precision does not harm beneficial insects, says Ciba.

Precision is formulated as a wettable powder, and is packaged in one-ounce water-soluble pouches.

Circle No. 195 on Reader inquiry Card

Engine super-cleans air, runs cooler and quieter

Tecumseh Products Company's Enduro 16OHV is a recoil start, 16 hp engine with power to spare, designed especially for commercial mowers.

The overhead valve engine gets up to 25 percent better fuel efficiency than engines with L-head designs, says the company. Horsepower per cubic inch is increased, and service life extended.

A pressurized oil pump lubrication system with a 55-oz. capacity lubricates all bearing surfaces for cooler running.

The Kleen-Aire filtration system filters air before it enters the air cleaner.

Circle No. 196 on Reader Inquiry Card

Remote control sweeper holds 5.2 cu. yds.

Smithco's Sweep Star 600 is a pull-behind turf sweeper with electronic remote control. The control box located near the driver's seat starts and stops the 20-hp engine, engages and disengages the sweeping system, activates the tailgate and dumps the hopper, without leaving the vehicle.

The dust-suppression system uses fine-textured, washable, polyester filters on the top and rear panels of the hopper, to remove 90 percent of the dust and dirt from the air discharge. The sweeping system uses a full-floating, 60-inch wide, single reel to pick up trash and debris as small as pine needles, cigarette butts and bottle caps.

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Drip irrigation can handle changes in water pressure

Equaline tubing, pressure compensating and infused with Root-Guard, is the newest subsurface drip irrigation product from Geoflow, Inc.

Equaline is fully pressure compensating from 10-to-45 psi with output uniformity unaffected by changes in water pressure or slopes.

Root-Guard comes with a 10-year guarantee against root intrusion, thanks to a patented process that infuses Treflan into each Equaline emitter at the time it's made.

Treflan is a chemically degradable, non-systemic herbicide that does not dissolve in water.

Circle No. 193 on Reader Inquiry Card

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New & Best-Selling Books

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Turf Managers' Handbook

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437 pages **LSM-BK-110**.....\$39.95

Controlling Turfgrass Pests

by Shurtleff, Fermanian & Randell
449 pages **LSM-BK-220**.....\$56.95

Turf Management Handbook

by Howard Sprague
255 pages **LSM-BK-620**.....\$26.60

Turfgrass: Science and Culture

by James Beard
658 pages **LSM-BK-630**.....\$62.95

Turf Irrigation Manual

by James Watkins
364 pages **LSM-BK-640**.....\$32.95

1993 Turf and Ornamental

Chemicals Reference
930 pages **LSM-BK-645**.....\$110.00

Compendium of Turfgrass Diseases

by Richard Smiley, Peter Demoeeden & Bruce Clarke
128 pages **LSM-BK-650**.....\$30.00

Landscape Management's Pocket Seed Guide

36 pages **LSM-BK-655**.....\$10.00

Trees & Shrubs

Insects that Feed on Trees and Shrubs

by Warren Johnson & Howard Lyon
560 pages **LSM-BK-690**.....\$52.50

The Shrub Identification Book

by George Symonds
379 pages **LSM-BK-720**.....\$19.50

The Tree Identification Book

by George Symonds
272 pages **LSM-BK-750**.....\$17.95

Diseases and Pests of Ornamental Plants

by Pascal Pirone
566 pages **LSM-BK-410**.....\$58.00

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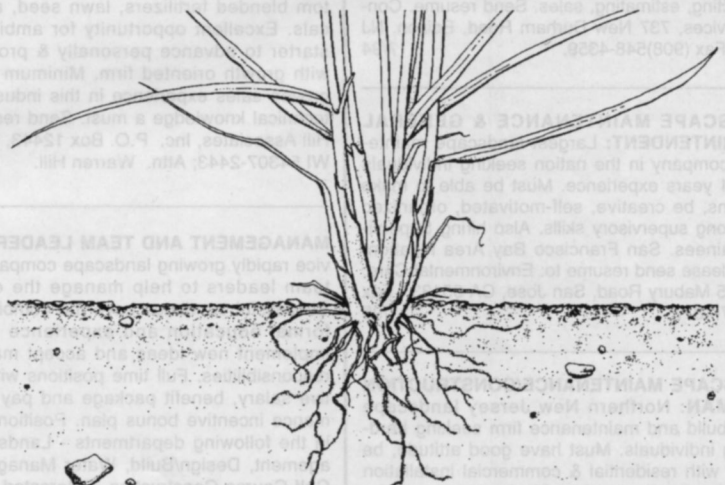
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ADVERTISER INDEX

| | | |
|-----|------------------------|-------|
| 101 | Andersons | 41 |
| 102 | BASF | Cv3 |
| 103 | Echo | 13 |
| 104 | Grasshopper | 11 |
| 105 | Hiniker | 36 |
| 106 | John Deere | 28-29 |
| 107 | John Deere..... | 28-29 |
| 108 | Lesco. | 31 |
| 109 | Lesco. | 31 |
| 110 | Lofts..... | Cv4 |
| | Miles (Insert) | 17-24 |
| 112 | Mill Creek..... | 45 |
| 113 | Ohio Turfgrass..... | 43 |
| 114 | Parker Sweeper..... | 45 |
| 115 | Pickseed | 35 |
| 119 | Tee 2 Green..... | Cv2 |
| 116 | Toro (Commercial)..... | 5 |
| 117 | Toro (Proline)..... | 39 |
| 118 | Walker Mfg..... | 27 |

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

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

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1. BUSINESS & INDUSTRY

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

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

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

B. Contractors/Service Companies/Consultants:

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

C. Suppliers:

- 11 0205 Sod growers
12 Other supplier (specify) _____

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

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

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