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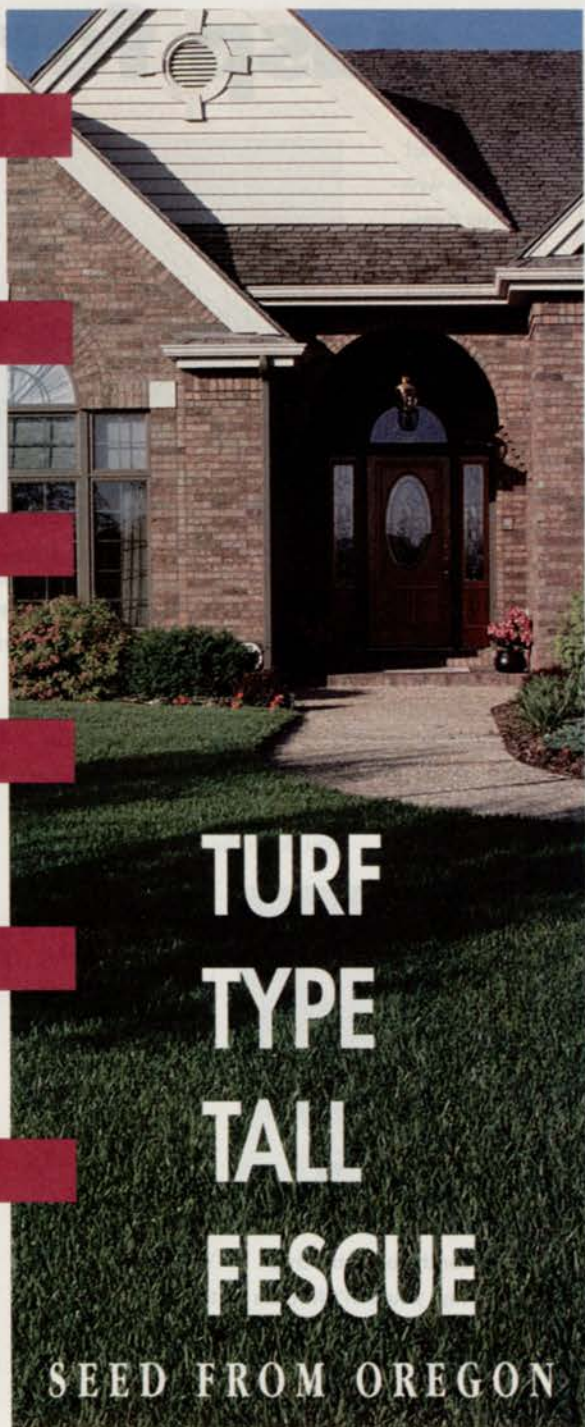
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# Transplanted trees gasp for oxygen

**A**rborist Dr. Carl Whitcomb wonders how transplanted trees ever survive being uprooted and replanted.

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

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

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

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



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

## Get energized

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

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

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

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

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

## Phosphorus a fantasy

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

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

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

## Use the application window

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

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

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

## Soils, nutrients key

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

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



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

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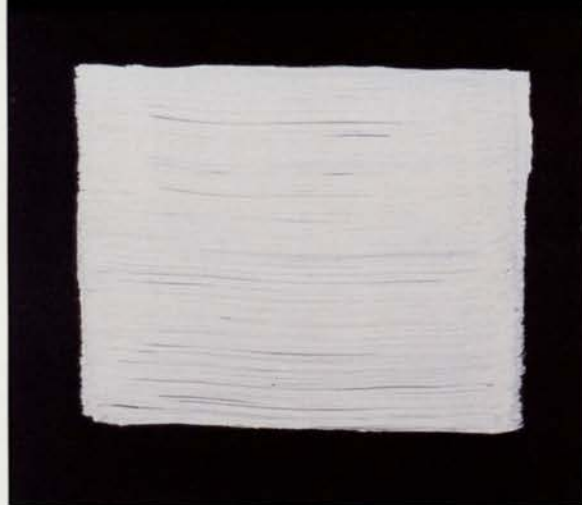


*Initial Application*



*After Moderate Simulate*

## **Flowable Generic Chlorothalonil Fungicide**



*Initial Application*



*After Moderate Simulate*

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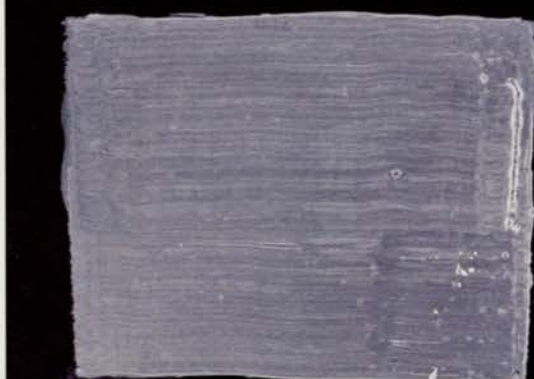
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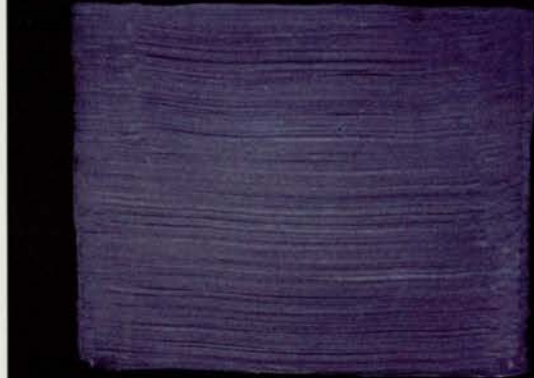
*d Rainfall/Irrigation*



*After Heavy Simulated Rainfall/Irrigation*



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**I**t's been another great summer of dealing with "contingencies," those things beyond our control that we all face at one time or another.

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

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

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

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

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

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

says turf has to be grown at three inches.

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

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

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

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

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

► Bob Dale, supervisor of grounds for the

## You can deal with what comes along



*Terry McIver*

**TERRY McIVER**  
Managing Editor

### GOLF/GROUNDS

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Heat stress easy to aggravate

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Making fairways greens-like

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Groundsman waits for normal

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GCSAA plans 21st century PR

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Pine needles as a ground cover

PAGE 16 G ▶

Siphons a cure for wet fairways

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

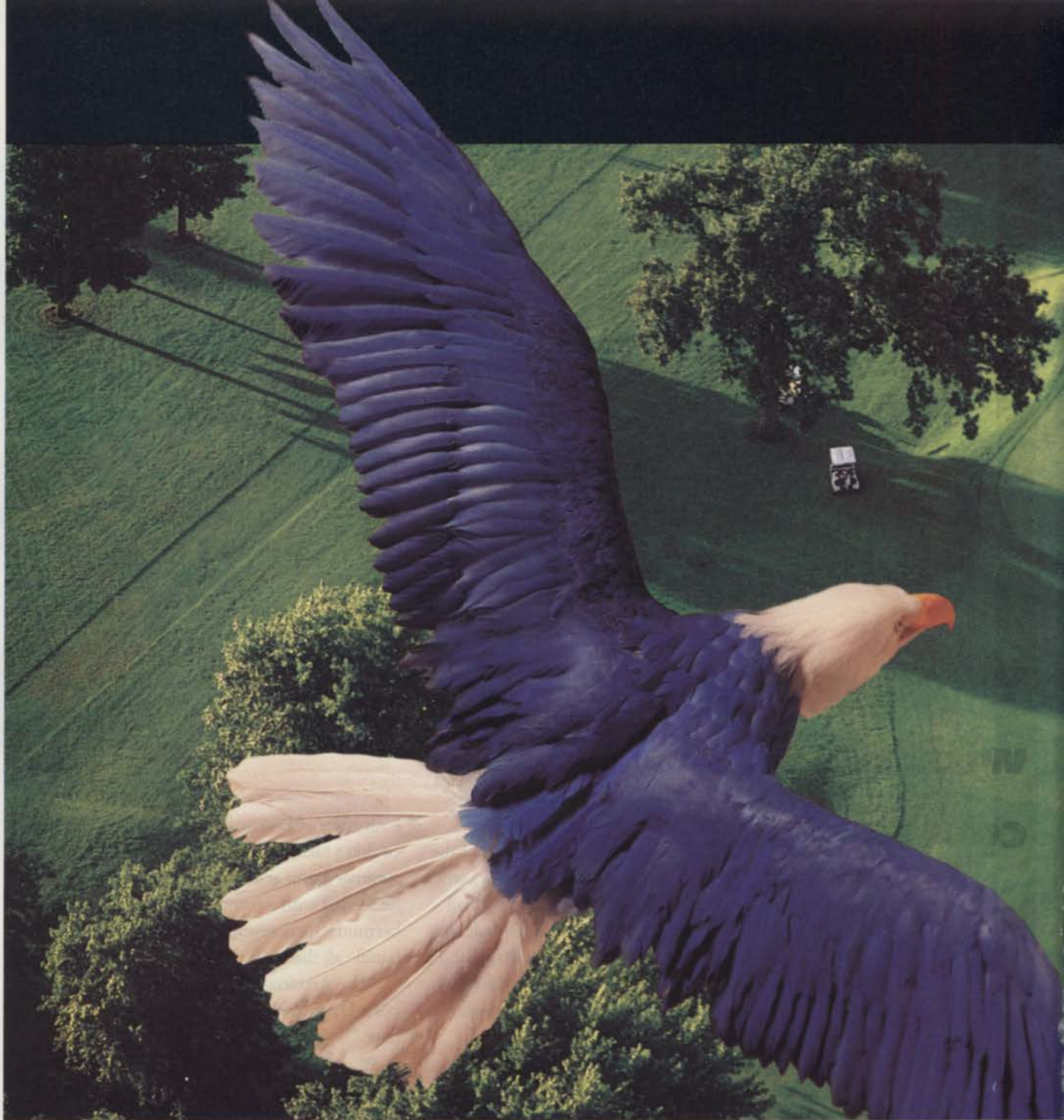
"The Arizona common filled in quickly," reports Dale, "and the field was in play five weeks later."

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

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

Get 'em used to government control while they're young! **LM**

**Comments? Write Terry at 7500 Old Oak, Cleveland, OH 44136; phone him at (216) 891-2709, fax him at (216) 891-2675 or e-mail him at 75553.502@compuserve.com.**



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TO-160

2/96

# Heat stress

## EASY TO AGGRAVATE!

by TERRY McIVER / Managing Editor

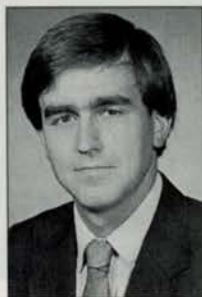
**B**y now, we probably have an idea of what the rest of the summer will bring, weather-wise. If it's as hot as it was in 1995, remember that one turf stress compounds others.

### Trouble down below

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

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

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



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

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

### Watch greens specs

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

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

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

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

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



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

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

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

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

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

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

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

### Aerify early

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

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

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

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

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

Spiking is one type of cultivation

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

#### Up the cut

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

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

#### Follow windows

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

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

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



**Chalifour: No greens rollers in high heat.**

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

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

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

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

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

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

## Fungicides & aeration: a one-two punch

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

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

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

#### Combine control methods

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

Albaugh adjusts irrigation as conditions warrant.

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

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

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

Cabarrus greens were first built from

hard, native soil.

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

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

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

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

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

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

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

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

cont. on page 20G



**Davis: Greens were breaking tines.**



**Albaugh: Keeps N high, K low.**

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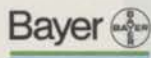
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▲ **Larry Schlippert:**  
Keep accessories clean  
and dry for golfers.

# Cultural work makes fairways greens-like

by DEBBIE CLAYTON

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

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

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

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

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

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

Relatively flat greens mean more usable space for pin placement and easier maintenance. Whereas greens are 100 percent Pennncross bentgrass, fairways, tees and approaches have a combination of Emerald and Penneagle bent. Schlippert cuts greens at ¼-inch, other bentgrass areas at ⅜-inch, and the bluegrass/rye/fescue roughs between 2 and 4 inches. The course has relatively few trees in some areas, so the deep rough makes a good penalty and helps keep weeds to a minimum. Deep roughs also reduce soil temperatures and water needs.

A single spring pre-emergence applica-

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

## Aggressive on Poa

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

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





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

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

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

The downside to using PGRs is that dis-

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

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

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

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

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

## Common problem, new solution

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

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

### No happy 'medium'

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

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

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



**Brandon Koehnke oversees one full-time worker, four seasonal full-timers and 11 part-time seasonal workers. Jacobs Field turf is 18 feet below street level, which helps keep turf temperatures in the mid-40s from March on.**

## A groundsman's dilemma: Waiting for 'normal'

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

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

In between it all was the baseball strike of 1994.

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

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

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

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

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

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

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

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

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

### Breaks and headaches

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

"When the team is away, we mow

every two or three days and verticut the field."

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

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

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

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

—Terry McIver





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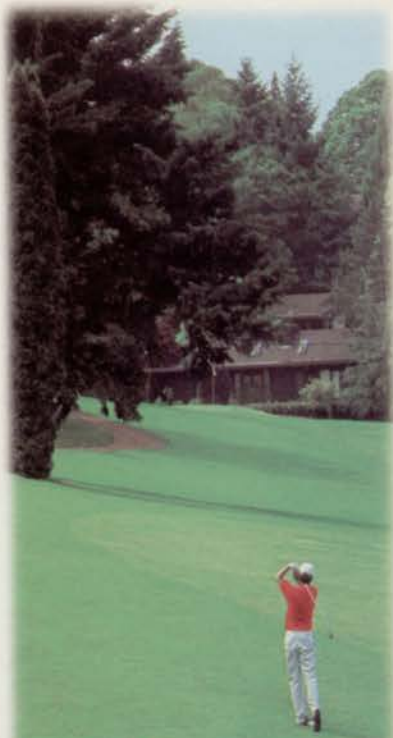
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# When bad publicity becomes a memory...

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

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

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

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

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

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

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

GCSAA has given the EPA a pesticide

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

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

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

#### Get children interested

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

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

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

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



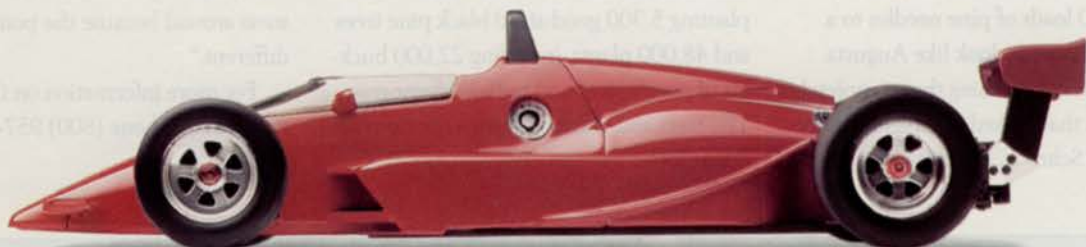
Grigg: GCSAA wants to work with EPA for 'reasonable goals'.

—Terry McIver

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# On 'pines' and needles

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

by LESLEE JAQUETTE

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

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

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

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

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

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

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

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

## Cost & maintenance

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

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

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

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



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

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# Siphons

## WORK ON POORLY-SLOPED FAIRWAYS

by LESLEE JAQUETTE

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

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

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

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

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

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

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

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

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

"The pipe from the basins doesn't have

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

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

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

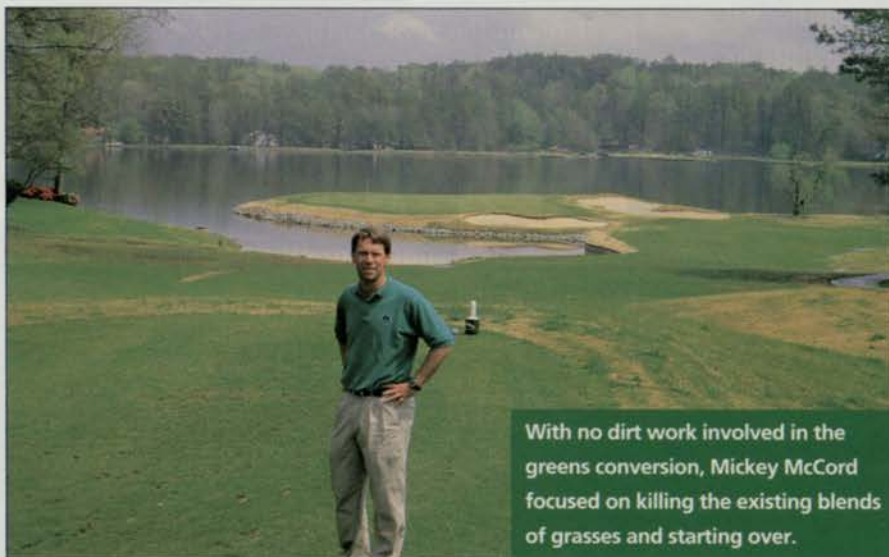
### \$2000 per green

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

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

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

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





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

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

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

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

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

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

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

"If a grass offers resistance in summer,

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

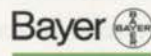
As it turns out, both the Dominant and Crenshaw have proved to be excellent choices for Carolina Trace. The Crenshaw grew so well, says McCord, that 14 greens needed only seven weeks to fully grow in. The remaining four suffered a lag due to shade problems. **LM**

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*The foundation of good disease management.*





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

*cont. from page 5G*

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

Eagle is one of the new technologies that

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

"It fits well into our rotation and into our

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

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

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

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

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

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"Once I got on a regular and consistent program, the benefits were obvious. The Floratine approach of foliar treatments and soil conditioning is a direct route for success."

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

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

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

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

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

about 75 percent common bermudagrass and 25 percent hybrid bermuda.

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

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

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

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

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

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

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

## Mowing or PGRs: which saves money?

by DON WILSON and BILL KNOOP, Ph.D.

# Making better turfgrass

by TERRY MCIVER / Managing Editor

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

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

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

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

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

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

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

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

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

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

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

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



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

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

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

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

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

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

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

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

controls."

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

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

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

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

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

"The Georgia Green In-



**Latimer:**  
*Landscape features influence pest and disease activity.*

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

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

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

says Murphy.

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

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

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



**Murphy:**  
*Adaptability to climate reduces turf stress.*

# Events

## AUGUST

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

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

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

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

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

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

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

**21-24: ALCA Certified**

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

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

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

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

**29: IPM Workshop, "Rec-**

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

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

## SEPTEMBER

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

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

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

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

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

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

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

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

**LM**

# Info center

VIDEOS AND LITERATURE FOR THE GREEN INDUSTRY

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

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

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

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

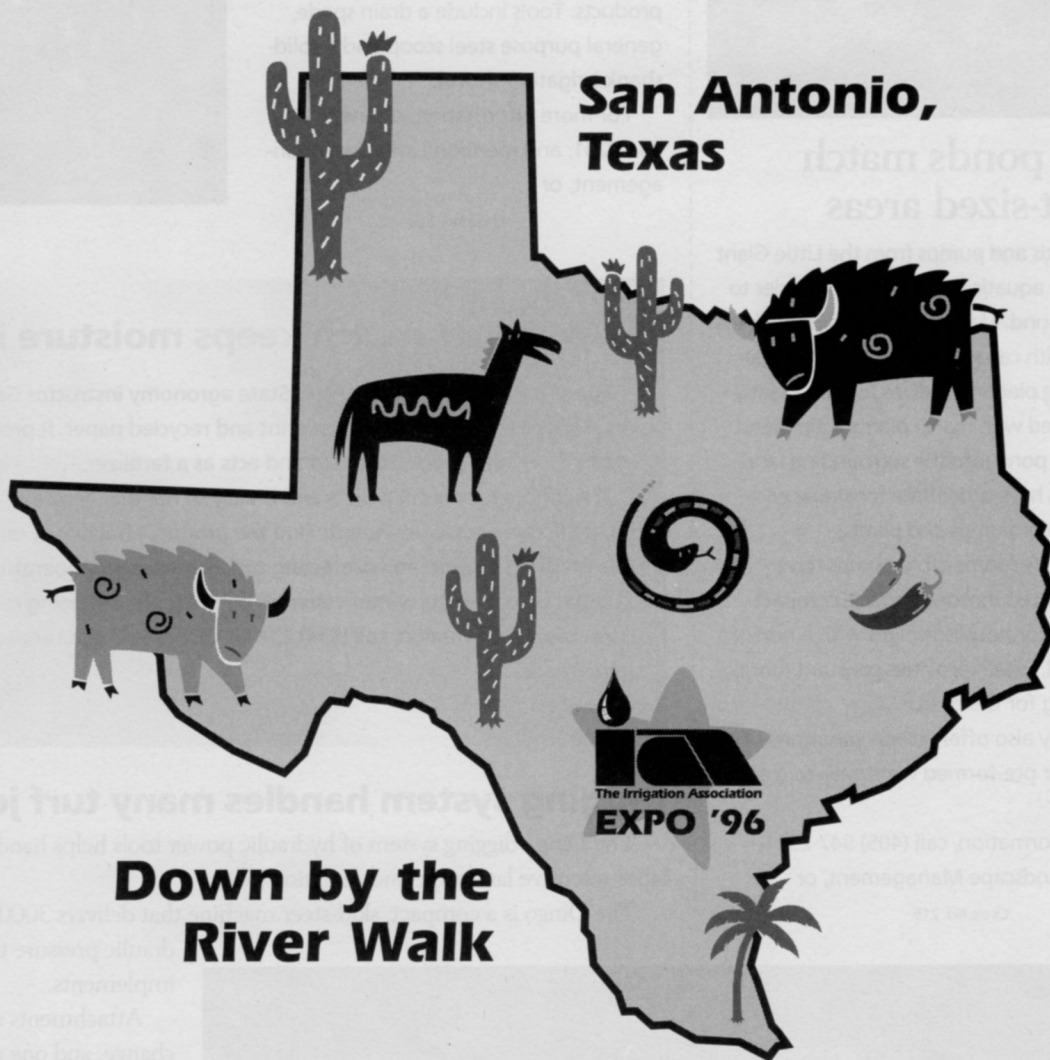
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Structron Corporation, a leading manufacturer of extra-strength, construction-quality, fiberglass-handled tools for lawn and garden uses, has released its new "Tools of the Future" catalog.

The catalog details key specifications and features of the company's eight new tools, including its Superhandle line of products. Tools include a drain spade, general purpose steel scoop and a solid-shank irrigation shovel.

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