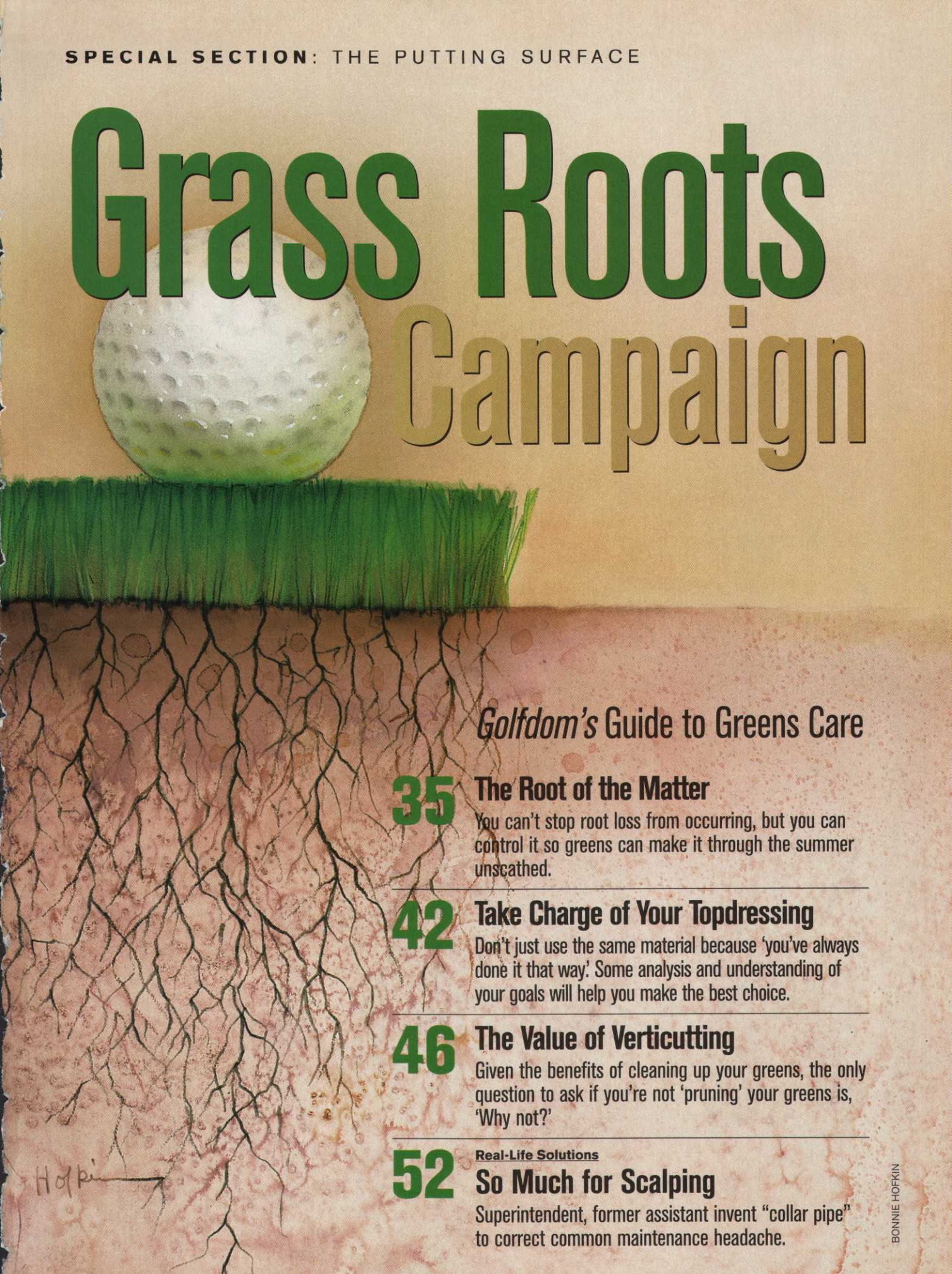
Grass Roots Campaign



Golfdom's Guide to Greens Care

BONNIE HOFKIN

The Root of the Matter

You can't stop root loss from occurring, but you can control it so greens can make it through the summer unscathed

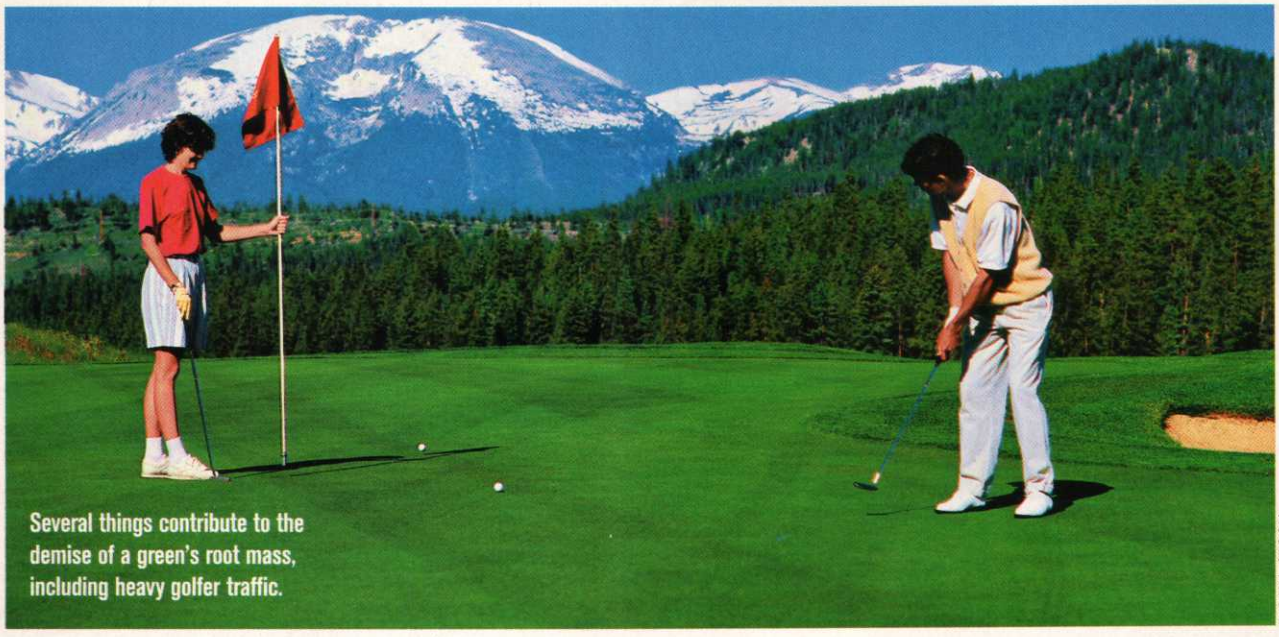
By Larry Aylward
Editor

What do you get when you combine small greens, heavy golfer traffic, searing heat, high humidity and no air movement? The ultimate turf stress.

That kind of intense stress can damage a green's root mass severely. And a green without root mass is kind of like an automobile without an engine: Both won't work without the other.

It's no scientific secret that root mass changes with the seasons in many regions. A green's greatest root mass is found in April and May. The smallest root mass is measured from August through October. But the loss of root mass in greens from the stress of summer on golf courses in the Midwest, Northeast, South and throughout the transition zone can be startling.

"Root mass can decline dramatically during the summer months," says Mark Mahady, president of Mark M. Mahady & Associates, a turfgrass consulting firm in Carmel Valley, Calif. Mahady states that research conducted by Fred Yelverton, a turfgrass professor at North Carolina State University, shows that creeping



Several things contribute to the demise of a green's root mass, including heavy golfer traffic.

DIGITAL STOCK

bentgrass root mass may decline up to 76 percent from May through September."

It doesn't matter if a course's greens are large or small, bentgrass or *Poa annua* or have a cool breeze blowing through them or not. If the course is located in an area where temperatures soar into the 80s and 90s and the humidity is stifling — which are normal summer conditions in many regions — the course's greens will experience root loss.

Stress comes naturally to turf from the increase in temperature, Mahady says. For instance, research conducted by Bingru Huang, while an assistant professor at Kansas State University (presently at Rutgers University), showed that photosynthesis declines in creeping bentgrass as temperatures increase above 68 degrees Fahrenheit.

The temperature is also hotter — from 5 degrees F to 9 degrees F — on the turf's canopy.

What's a superintendent to do? Simple. He or she needs to monitor the root mass on the course's greens during the summer months. Superintendents can't stop root loss in greens from occurring, but they can control it so their greens make it through the summer unscathed.

To preserve root mass, Mahady says bentgrass and *Poa annua* greens need to be maintained gently from August through October. Most importantly, that means raising the mowing heights. Mowing greens too close in the summer for the sake of keeping them fast will cause root mass to diminish even more, Mahady stresses. Raising the height of cut not only helps preserve root mass, it also helps suppress disease because the plant is more vigorous.

"It's the same with you and me," Mahady says. "If we take better care of ourselves — we don't smoke, we eat properly and we exercise — we're going to get through those times when we have bad colds. It's the same concept with turf."

But the height-of-cut issue is a tricky one for some superintendents, especially ones at high-end clubs where golfers want fast greens consistently. Some superintendents say raising the height of cut in mid-summer is easier said than done.

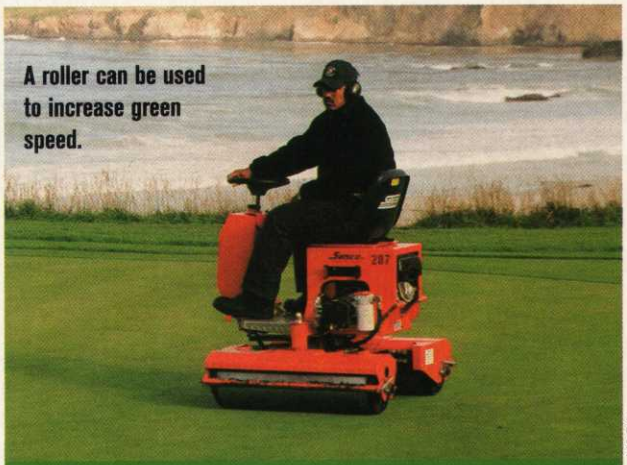
Jon Jennings, certified superintendent of the Chicago Golf Club in Wheaton, Ill., agrees with Mahady's philosophy, but says he would hear complaints from members if he adhered to it.

"It would be nice to mow at a higher height and reduce some of the stress," Jennings says. "But that's not realistic here."

John Burns, certified superintendent of The Gauntlet at Curtis Park in Fredricksburg, Va., doesn't prefer to raise the height of cut on his course's greens, but he will if it means protecting them. "The golfers don't really like it much, but sometimes you have to do what you have to do," Burns says.

On a good summer day, The Gauntlet might do 200 rounds. Burns realizes that stress from the traffic combined with the heat humidity could equal trouble for the course's greens.

"If we have a few greens that are stressed, we'll walk mow them at a higher cutting height from June through August," he says.



A roller can be used to increase green speed.

USGA

Puttin' Down Roots

Mark Mahady, president of Mark M. Mahady & Associates, a turfgrass consulting firm in Carmel Valley, Calif., says that research has shown that reducing height of cut from five-thirtyseconds of an inch to one-eighth inch during August, September and October reduces root mass by 25 percent and photosynthesis by 30 percent to 40 percent, while respiration continues to deplete carbohydrates.

Mahady suggests the following to help root mass:

- Be particularly kind to your greens from August through October. Maintain mowing heights of five thirty-seconds of an inch during periods of extreme stress.
- Use kelp-based biostimulants or a regularly scheduled basis prior to the onset of summer stress (April to June) and throughout the summer season (July through September) to improve root biomass, root vigor and overall surface quality.
- Skip one mowing per week, if possible, and use a greens roller to increase green speed without reducing height of cut.

While some newer bentgrasses can withstand the stress of close mowing heights, the Gauntlet's Pennlinks greens can't, Burns says. Still, even though newer varieties feature more heat tolerance, they still need to be maintained gently during the summer heat, Mahady stresses.

"I can't emphasize enough how important it is to raise your mowing heights once you get into August," Mahady says, noting that superintendents can still roll greens to keep them fast.

Mahady realizes that some superintendents will take flak from members for having slower greens. He says they need to try to educate their courses' owners, green committees and members that what they're doing to preserve root mass in the summer is in the best interest of the turf. There are cultural practices that should be performed and those that shouldn't be performed to maintain healthy roots.

A big "should not" is double cutting greens unless there's a tournament being played, Mahady says. Superintendents should also refrain from heavy sand topdressing and large-tine aeration.

"If you need to vent the greens, use quarter-inch hollow tines

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during August and September," Mahady says. "Open them up, pick up the plugs and roll them out.

Burns agrees with Mahady. He'll double cut greens, but only if the course is staging a tournament such as the member-guest. He will topdress greens every few weeks, but very lightly.

"You have to be careful about any cultural practices you're doing," Burns says. "I know people scream about cutting heights, but grass putts a lot better than dirt."

Mahady is also a proponent of kelp-based biostimulants to increase root mass. But it's important that biostimulant programs are implemented before the start of summer so root mass can accumulate. Mahady says greens should be treated with biostimulants every two weeks from April through October. Biostimulants won't stop roots from diminishing, but the extra growth they spur can slow the process.

A superintendent must begin in the spring to maintain healthy roots in the summer, Burns says. To achieve that, Burns and his crew perform two aerations — one coring and one deep tine — in late March. "We do one quarter-inch coring and blow the cores off, and then we do a half-inch deep tine about 10 inches to 12 inches down," he says.

During the summer, Burns will also spike his greens to open them up and keep air and water flowing sufficiently to the roots.

Did You Know?

- Young plants generally produce the most roots.
- Moisture extremes (too dry or wet) discourage rooting.
- Soil pH outside the range of 5 to 8 may limit root growth
- Cool-season grasses are much more sensitive to mowing heights than warm-season grasses and tend to be severely restricted as the mowing height is decreased.

Best Golf Course Management Practices by L.B. McCarty

Burns also uses wetting agents to keep moisture in the soil. He says the key is for greens to go into the summer with as much root mass as possible. Then any loss isn't as crucial.

"If you lose 75 percent of 2 inches, you've lost a lot," he says. "If you lose 75 percent of 4 inches, you're doing a little better."

While superintendents should strive to build root mass in the greens, they should all strive to keep them as dry as possible in the spring to prepare them for summer's onslaught. "You want to pre-stress them by drying them out," Burns says.

Some superintendents can get away with not coddling their course's greens. In the heat of the summer, Jennings continues to mow the Chicago Golf Club's greens at .115 inch so

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they roll at 10 feet or higher consistently. He and his crew also double cut the greens two or three times weekly and roll them three or four times a week. Jennings also doesn't back off from topdressing and verticutting or brushing every other week.

How is Jennings able to do that? Carefully. But Jennings admits the Chicago Golf Club is different than other courses in some important aspects that relate to cultural practices.

> "I know people scream about cutting heights, but grass putts a lot better than dirt."
>
> **JOHN BURNS**
> CERTIFIED SUPERINTENDENT
> THE GAUNTLET AT CURTIS PARK

For example, the greens are big, averaging about 7,400 square feet. The course also only averages about 7,000 round a year. Large greens and lack of traffic minimize stress. It also helps that the greens are in open areas where air movement is at a premium. Oh yeah, they drain well, too.

"We have such a good growing medium on the greens that we don't see a significant decline in root growth, although there is some during the hotter parts of the summer," Jennings says.

The Chicago Golf Club's greens are also about 70 percent *Poa annua*, which doesn't have as deep a root system as bentgrass. Hence, Jennings, who cuts cups at the course, is constantly monitoring root growth during the summer.

"We're trying to provide the best playing conditions possible," Jennings says. "But with *Poa* being a more sensitive plant than bentgrass, you have to be careful. There's a fine line between dry and dead."

One thing Jennings does in the summer is implement a thorough syringing program to keep greens cool. Syringing is vital to cool the turf and sustain root mass. Mahady says turf canopy temperatures can be reduced several degrees by proper syringing and increasing height of cut during the hot months.

"You're really not trying to get water down into the root zone," Burns says. "You just want to cool off the turf's canopy."

Bentgrass greens don't require as much syringing as *Poa* greens because they're more drought-hardy and have more root mass. Hence, Jennings says he and his crew must syringe longer into the day in the summer, sometimes until 7 p.m.

Mahady stresses that water quality is a huge issue when it comes to syringing. "It's dangerous to syringe with poor quality water," he says. "You don't want to put on fine layers of salt." ■

Take Charge of Your Topdressing

Don't just use the same material because 'you've always done it that way.' Some analysis and understanding of your goals will help you make the best choice

By Frank H. Andorka Jr.
Managing Editor

Andrew McNitt, assistant professor of soil science at Penn State University, often cringes at the responses when he asks superintendents about their topdressing materials.

"In some cases, what you'll hear back is that they're topdressing with the material because that's what they've *always* done at the course," McNitt says. "That's exactly the wrong way to choose a topdressing material. It requires more thought than that."

Topdressing greens has evolved over the years. Superintendents used to consider it sufficient to topdress heavily once or twice a year to break up the thatch layer. Now, most superintendents are moving toward light, frequent topdressing programs to aid with drainage, amend the soil and smooth the putting green surface.

More frequent topdressing, however, means superintendents must be more discerning about the material they use. A wrong choice can lead to the creation of a perched water table, which could harm the root system and threaten the health of the greens. If superintendents take the time to analyze their soils and establish clear goals, they'll be much happier with the results.

A light, frequent topdressing prevents superintendents from beating up mower reels too badly.

PHOTOS COURTESY OF BIG CANYON COUNTRY CLUB

Check your soil

Superintendents need to decide what they want to accomplish before they start topdressing programs, McNitt says. Common reasons for instituting the practice usually fall into three categories: smoothing the putting surface, amending the soil to improve drainage or diluting a thatch layer.

David Gourlay, general manager, director of golf and certified superintendent of Colbert Hills Golf Course in Manhattan, Kan., says superintendents should have the soil tested to determine what kind of material to use. "You want your topdressing material to complement or supplement what's already there," he says.

This is crucial because superintendents can end up creating drainage and root-zone problems that will require more work to alleviate if the materials aren't complementary, says Rick Fiscus, superintendent at West-Chase Golf Club in Brownsburg, Ind.

"Small discrepancies will end up causing prob-

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Take Charge of Your Topdressing

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lems," Fiscus says. "You can end up ruining drainage and leaving puddles on your greens. You don't want to use anything that's going to inhibit porosity or percolation rates."

A proper soil sample includes the top 4 inches of the soil and should be sent to a qualified laboratory for analysis, McNitt says.

Jeff Beardsley, superintendent at Big Canyon Country Club in Newport Beach, Calif., says he tests the greens' soil every year to make sure he's still achieving his goals.

"We haven't had to change our topdressing material since 1998 because we take great care to make sure what we're doing is still working," says Beardsley, whose topdressing goal is to improve his greens' drainage. "I wouldn't know that, however, if I wasn't testing."

Test your sand

It's not just the soil that needs to be tested, however, Gourlay says. Superintendents should also send their potential topdressing material to a lab.

"There's no such thing as straight sand," Gourlay says. "All sands have some level of silt and clay, and that can affect the way they react to soil conditions."

Fiscus says when he arrived at West-Chase, the grow-in superintendent had stopped using the sand with which he'd built the greens as topdressing. After having the original sand tested and discovering it more compatible, Fiscus changed it back.

"Everyone has their local dealers who can give them good deals on a nearly perfect match," Fiscus says. "But it's not exactly the same, and you might run into compatibility issues."

McNitt says superintendents shouldn't use a topdressing sand merely because they used it to build the green, however. "What if you have lousy sand to start with?" he asks.

Gourlay says superintendents must not focus on particle size exclusively. The shape, infiltration rates and air-space considerations are equally important.

"You can have two sands that are the same size, but one might be flat and the other round," Gourlay says. "The round sand will offer the proper amount of pore space so air and water can get to the plant roots, but the flat sand will create a barrier."

Sand vs. soil

One of the more heated debates about topdressing is whether it should include organic material. McNitt says he supports topdressing with straight sand on a light, frequent basis. He believes most superintendents are moving in that direction.

"Turf deposits tons of organic matter per acre per year," McNitt says. "If one of your reasons for topdressing is to manage thatch, why add organic matter in the topdressing?"

For a light frequent topdressing program, McNitt says it's probably advantageous to have no particles greater than 1 millimeter (mm), and that having them no bigger than .75 mm is typically even better, he says.

Some Essential Topdressing Facts

According to Patrick O'Brien, director of the USGA Green Section's Southeast Region, here are some facts about sand topdressing:

- When organic matter reaches 3 percent to 4 percent by weight of the soil profile, that's when superintendents start to see secondary problems like disease infestation and drainage problems. That's why sufficient sand topdressing is necessary to maintain USGA specifications in the root zone.
- The USGA defines a light topdressing as .5 cubic feet per 1,000 square feet per application. A medium topdressing is 2 cubic feet per 1,000 square feet, and a heavy topdressing is 4 cubic feet per 1,000 square feet.
- Superintendents should apply 40 cubic feet to 50 cubic feet of sand per 1,000 square feet per year to keep USGA-specification greens with the proper sand ratio in the root zone.
- Forty cubic feet to 50 cubic feet per 1,000 square feet per year equals 4,000 pounds to 5,000 pounds of sand over the same year, or about .6 inches of sand per year.
- Nonoverseeded Tifdwarf bermudagrasses only require 35 cubic feet to 40 cubic feet of per 1,000 square feet of sand per year, while overseeded bermudagrasses require more than 50 cubic feet per 1,000 square feet of sand per year.

– Frank H. Andorka Jr., Managing Editor

On the other side of the debate is Gourlay, who says adding organic matter can help keep greens healthy.

"I'm not saying you should go out there with a mix that's heavily tilted toward organic matter, but having a little bit helps," Gourlay says. "You have to give beneficial organisms a medium to grow in. Otherwise, your root zone will suffer."

Gourlay also says adding soil to the topdressing mix helps prevent isolated dry spots and pH problems in greens. He wouldn't, however, put more than an 85 percent/15 percent mixture on his greens.

He adds that the percent ratio is dependent primarily on the frequency of application.

In the end, no matter how much analysis superintendents do to create the perfect topdressing mixture for their courses' greens, it's still enough of an art that they shouldn't be afraid to explore different options, Gourlay says.

"You're not going to find a perfect topdressing solution from someone else," Gourlay says. "You can't be afraid to experiment to find a solution that works best for you." ■

The Value of Verticutting

Given the benefits of cleaning up your greens, the only question to ask if you're not 'pruning' them is, 'Why not?'

By Frank H. Andorka Jr.
Managing Editor

Jason DeMartino, superintendent at Audubon Country Club in Naples, Fla., gives his golfers an explanation he hopes they can relate to when they ask him why he verticuts his greens.

"I've found that if I tell them I'm pruning the greens the way they would prune trees — to make the plant grow stronger and more healthy — they understand it immediately," DeMartino says. "It's much better than trying to overload them with the scientific explanation for it."

Assistant superintendent Kevin Neils verticuts a green at Audubon Country Club in Naples, Fla.

PHOTOS COURTESY OF AUDUBON COUNTRY CLUB

Verticutting, or the process of removing some of the vertical growth that occurs around a grass plant, provides several potential benefits for the turf. It can:

- force the remaining turf to stand up straight and smooth the putting surface for better ball roll;
- increase green speed;
- open the turf canopy to allow in more sunlight;
- makes topdressing easier to work into the soil; and
- allows the plant to put more energy into growing upright shoots instead of lateral shoots.

But verticutting isn't something that can be done haphazardly. Superintendents should account for weather patterns, grass varieties and region of the country when deciding how often and how aggressively to verticut. If superintendents have any doubts about what they're planning to do, experts say they should check with their peers who are experienced verticutters. This careful preparation will help them get the most benefit from the practice.

How it works

Normally, when superintendents mow greens, the blades cut the turf horizontally, taking off the top of the crown to reduce its height. Verticutting blades, which can be fitted on most triplex mowers, rotate in the opposite direction. The goal is to

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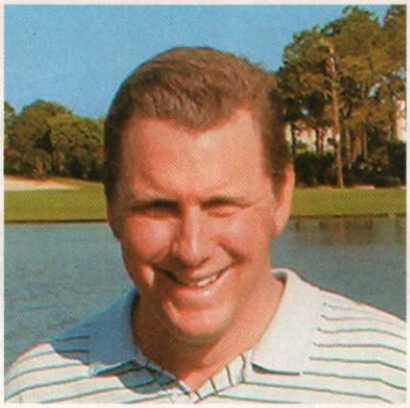
reduce the number of stolons on leaf blades that grow laterally, says Ron Wright, certified superintendent at The Country Club of Mobile (Ala.).

"Every time a plant grows new shoots, it takes energy," Wright says. "If you cut off some of the lateral plant growth, it forces the plant to use that energy elsewhere. The plant will use the excess energy to grow upward, creating a more upright and dense stand of turf."

Tighter turf also increases green speed without lowering mowing heights, says Cory Blair, certified superintendent at Rarity Bay Golf & Country Club in Vonore, Tenn. He says it also allows the ball to roll more smoothly.

DeMartino says he combines a verticutting program with plant growth regulators to keep his greens consistent from one hole to the next. He says verticutting also increases water penetration and air movement — two essential ingredients to healthy turf.



Superintendent Jason DeMartino says his members understand the verticutting process more easily if he describes it as "pruning" the turf to promote strong growth.

Be careful

Superintendents who verticut on a regular basis warn their colleagues that an indiscriminate program can do more harm than good.

"Anytime you're mechanically damaging the plant, whether by regular mowing or verticutting, you're opening the crown of the plant," says Russ Heller, certified superintendent of Franklin Park Golf Course in Boston. "That gives diseases and other pests opportunities to harm the turf."

Heller says superintendents should also be careful to watch the weather when deciding whether to verticut or not. If the weather is too hot (in the case of Franklin Park, Heller says that's June, July and August), verticutting can stress the turf so much it can severely damage it.

DeMartino says superintendents should wait to verticut until the dew burns off to avoid turning their greens into muddy messes. "You don't want to verticut wet turf — it will get ugly."

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The Value of Verticutting

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Not only is verticutting dependent on the region, it's also dependent on the grass variety, Wright says. For example, when Wright had TifDwarf bermudagrass greens at The Country Club, he would verticut every other week (and topdress on the weeks in between) because the turf grows so aggressively. Now that he's moved to an ultradwarf bermudagrass, he doesn't verticut as often because the turf recovers more slowly from the procedure.

"If you verticut an ultradwarf, you can still see the scars three weeks later," Wright says. "That's not acceptable at most courses."

Wright says superintendents in the South, where ultradwarfs are more prevalent, are moving away from aggressive verticutting.

Blair says he also changed his verticutting practices when he switched from Crenshaw bentgrass to PennCross bentgrass. Superintendents have to verticut Crenshaw more aggressively because it's such a tight turf that topdressing can't get down into the soil profile. With PennCross, raising the green speed is more the issue, Blair says.

"Before you start verticutting, you have to understand your variety completely," Blair says. "You don't want to create a program that won't do what you want it to."

As with so many other cultural practices superintendents employ, there's no one verticutting program that will work for everyone, Blair says.

"If you're in doubt, turn to your local extension agents or other superintendents in your area to see what they're doing," Blair says. "It's such a region-dependent practice that your best guides through the process are your peers." ■

Tips and Tricks

Here is some general advice from superintendents for effective verticutting:

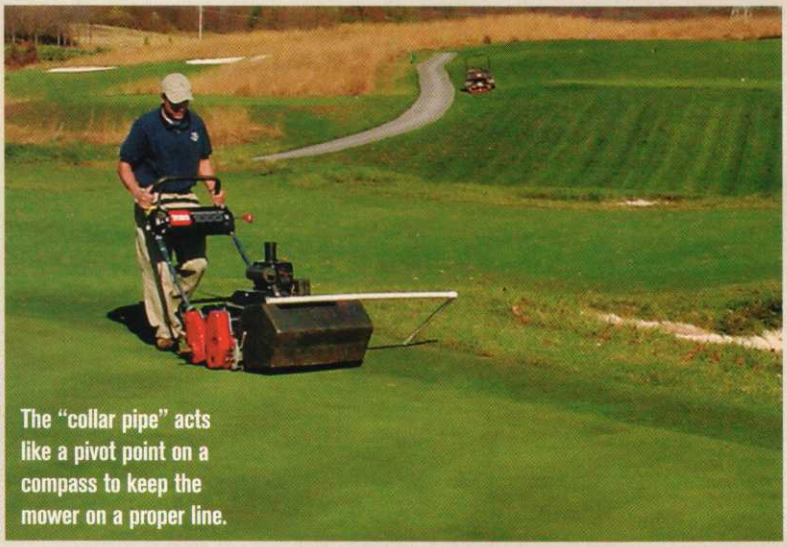
- Focus on periods of time when the grass is growing aggressively because verticutting when the turf isn't growing strongly could lead to the most damage.
- Set your verticutting blades to a uniform depth of cut to avoid scalping.
- Don't think that verticutting is a substitute for aerification because you'll never remove enough of the soil profile to make a difference.
- Topdress lightly afterward to smooth the greens, and brush or water the sand in afterward.
- Test your program on the practice putting green before taking it out on to the course because it will give golfers the heads up that you're trying something new.
- Alert your pro shop about what you're doing and why. Most of the complaints about the procedure are going to be lobbied there first, and you want to have the pro to have a ready explanation.

– Frank H. Andorka Jr., Managing Editor

So Much for Scalping

Superintendent, former assistant invent "collar pipe" to correct common maintenance headache

BY MARK LESLIE



COURTESY OF FOUR STREAMS GOLF CLUB

The "collar pipe" acts like a pivot point on a compass to keep the mower on a proper line.

Problem

Scalped greens damage grass, arouse angry comments from golfers and create myriad headaches for superintendents.

Solution

Create a "collar pipe" that guides the mower around the edge of the green like a guide on a table saw. The device has eliminated scalping at Four Streams Golf Club, according to the superintendent.

With visions of table-saw guides dancing in their heads, certified superintendent Ray Viera and his former assistant Rob Larsen brainstormed their way to eliminating scalping and "moving greens" at Four Streams Golf Club in Beallsville, Md.

"All superintendents have scalped collars, and we have completely eliminated that," Viera says.

Choosing a walk-behind greens mower that would be dedicated to the cleanup cut on all the greens, Viera and Larsen, who now works for LESCO, drilled a series of holes on top of the clippings basket and attached what they call the collar pipe.

The thinking that they needed something that would stick out like a guide on a table saw fostered the idea. The L-shaped collar pipe has a 90-degree joint, so that it hangs out 30 inches from the roller on the mower and points to the outside edge of the collar.

As long as the downward pipe is lined up with the outside of the collar, Viera says a green can't be scalped. "It eliminates narrowing of collars and any other cutting problems associated with an operator who does not do the same pass each time," he adds.

The collar pipe, which can pivot and reverse directions, makes a perfect circle, Viera says, adding: "It's like the pivot point on a compass. As long as you have the pipe lined up, you can't stray from that orbit. Sometimes you see a triangular cut of grass in the cleanup, but we never have that here anymore."

Noting that operators normally "free-hand" the cleanup cuts so that they're never the same, Viera says another key besides the dedicated mower is a dedicated person on that mower.

"This type of innovation enables us to design the bunkers and other features closer to the putting surface," says Steve Smyers, the architect of Four Streams. "This allows these features to fit more in context with one another and also allows for the development of greater strategy and risk-reward."

Asked how they got the idea, Viera replies, "Out of necessity."

Perhaps the old saying — "necessity is the mother of invention" — is true. ■

Leslie is a freelance writer from Monmouth, Maine.