from 1997 to 2006. There, he was able to let his greens grow a little longer and roll them.

"That let us get the speeds we were looking for," he says.

Based on that experience, he pushed for a roller since he started at Warren.

"I was proactive," he says. "I started to aerify and bring in rollers and demo them for members and management. We finally went out and bought a roller. The ones that hook to greensmowers don't appear to be that effective to me, so we bought a separate one that operates as a separate piece."

The rolling creates the proper surface on the green and helps cover the holes created by aerification, Petersen says. His rolling program will start this year with a frequency of three times a week.

"That causes dramatic changes," he says. "I'm looking for nine to 11 Stimpmeter speeds, eight to 10 for everyday use."

But the real secret to improving greens is an aerification program, Petersen says. Aerifiying the push-up greens at Warren, which are without drainage, has resulted in dramatic changes, and they've become more manageable.

"We started aerification once a month last year," he says. "We're verticutting and power raking, too. They hadn't aerified anything for three years. There was a 3.5-inch thatch layer. We've reduced it some, a quarter of an inch of thatch already, maybe a half-inch, but it's going to take a while to get rid of this."

Aerification is where it's at for Jay Wagner, CGCS, at Cherokee Ridge Country Club in Union Grove, Ala.

"It used to be standard to do it two or three times a year, and now we do it monthly, March to October, maybe more," Wagner says. "We make quarter-inch holes but don't pull plugs. Then, we run a roller behind it. You don't notice it."

This new practice is making the course at Cherokee Ridge look better, and new technology is helping, Wagner says.

"There are better aerifiers with better tines now," he says. "We have four new ones."

When Petersen began aerifying regularly at Warren, there was a noticeable difference immediately, he says.

"The turf responded like I was giving it first aid," he says. "I'm using shatter tines and needle tines. I'm verticutting on a regular basis and topdressing. We do something once a month."

More aerifying instead of less can give turf the space it needs to breathe and grow. During the summer, aerifying opens up the turf and gets air into it.

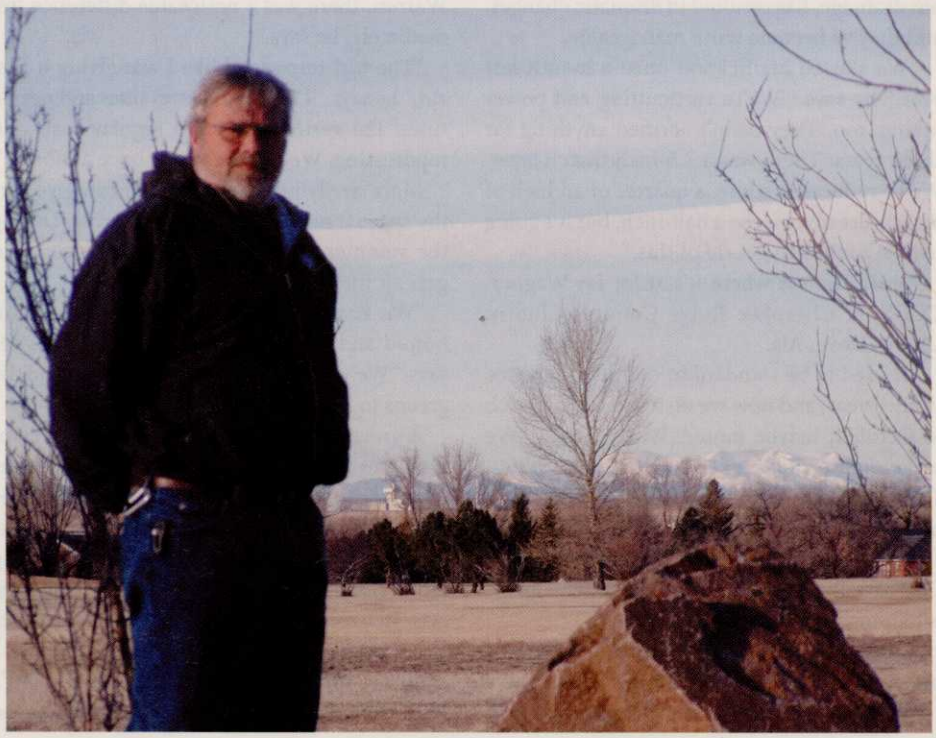
"We have bentgrass, and it gets hot and humid and the grass doesn't like it," Wagner says. "We've also installed some fans around the greens to keep the air circulating."

A greens and bunkers renovation was completed in 2002 at the private Cherokee Ridge, which built in 1992. Two years ago, Wagner began his aggressive aerification practice. In the spring and fall, he'll core. He's also topdressing more, timing that around the big aerifying projects. Between big projects, he uses needle tines to keep organic material from building up.

"It has improved turf quality," he says. "It's stabilized. It can get pretty sick looking at the

At Poppy Ridge Golf Course (opposite page), superintendent Todd Cook changed his fertility program and is using many more foliar applications with sulfates because it helps firm up surfaces and control silvery thread moss. Photo: Poppy Ridge Golf Course

At the Warren Golf Club, superintendent Dan Petersen is looking for Stimpmeter reading between eight and 10 for everyday use. Rolling the greens helps achieve this.



Dan Petersen increased the frequency he aerifies the push-up greens at Warren Golf Club to once a month to help reduce a 3.5-inch thatch layer.

end of the long summers that we tend to have. It was beneficial last summer when we had the hottest summer anyone could remember."

Petersen wants to take his aerification projects a step further. A drill-and-fill machine is on order.

"The Air Force tries to renovate five courses a year," he says. "If I use a drill-and-fill machine twice a year, I could save them a renovation. I'd change the soil composition. I used one at Ramstein and made dramatic changes. It really gets that sand down there."

Petersen is considering a deep-tine aerification this year, too.

"I'd like to, but it's harder to get the sand down in the hole," he says. "The drill-and-fill is better. That's the direction I'm going. I found a contractor to do the deep tining pretty cheap, and I'd like to do it twice a year, but you can't do it in September because the holes won't heal. There's not a lot of healing time after that in this area of the country."

PRECISE WATERING

In addition to punching holes in the turf, Petersen has to worry about his water supplies.

"It's completely opposite of Ramstein," he says. "In Germany, the course was like a cookie-cutter in the middle of a forest. It rained and was cloudy all the time. We averaged seven inches of rain a week. Here, I don't get seven inches a year. It's been a learning experience. If my irrigation failed in Germany, Mom Nature watered. If it fails here, I'm out hand-watering."

Brian Sullivan, CGCS, is in charge of maintaining the Bel-Air Country Club's golf course in Los Angeles, another place where water is a premium. The easiest thing to do is install a good irrigation system, he says, noting that not everyone can afford a $2.5 million system. But if one can, it's the way to go.

"It's been in the ground two years," he says. "Our distribution uniformity is as good as you can get in the industry. We have enough heads that we can separate greens, tees, fairways and roughs."

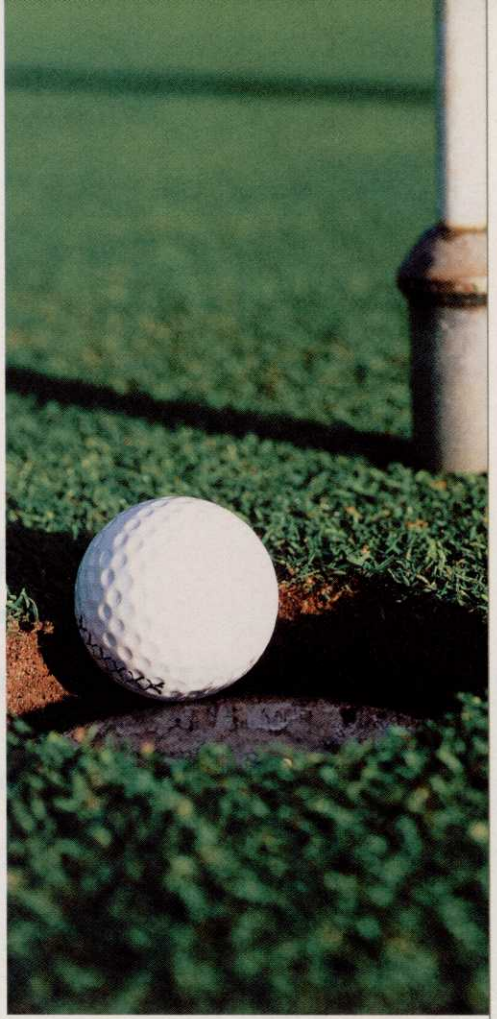
Sullivan has 3,000 irrigation heads at his disposal that allow him to target water to a specific area of the golf course and give it the proper amount of water. That way, one saves water, he says.

"If you're not overirrigating, you eliminate a good deal of wet and dry situations," he says. "So you have healthier plants without overirrigating."

Superintendents working with irrigation systems that are 20 years or older might have distribution uniformity rated in the low 60s, Sullivan says.

"In a 10-minute irrigation cycle, you'd have to run water 14 minutes to be effective," he says. "If I put in a component that's 90 percent, that's 1.1. That head could function with 30 percent less water. Now I've properly irrigated."

Because there's no off-season in Southern California, it was difficult for members to be without a golf course for four months.



> "The Air Force tries to renovate five courses a year. If I use a drill-and-fill machine twice a year, I could save them a renovation."
> - DAN PETERSEN

"It's never easy," Sullivan says. "The amount of heads we have, near 3,000, it was four to six months, impactwise. But our membership is happy it's installed."

Most years, Sullivan doesn't have to worry about a drought. But this year, starting last fall, he's had only one inch of rain. Normally, one doesn't have to irrigate a whole lot December through April.

"This year, we're entirely dependent on the irrigation system, so it's something that was really necessary," he says.

At first, Sullivan thought the efficiency of his new system would save him money. It's not uncommon for courses in the area to spend a quarter of a million dollars a year on water, he says.

"If you're conserving 30 percent you're saving money," he says. "We are 15 to 20 percent more efficient. Of course, the price of water has gone up in the past two years, so I'm not sure exactly how much I'm saving."

Water is a subset of a larger movement that Sullivan's been aware of the past few years, and that's environmentally sound maintenance practices.

"If you're not on that bandwagon, you're behind," he says. "I've got it down to the recycling of cardboard. Our membership expects it."

Every superintendent must embrace the fundamentals of water usage and other practices in integrated pest management, Sullivan says.

"Within the confines of that, we are stewards of the property," he says. "You have to be environmentally conscious."

FOLIAR FEEDING

Todd Cook, golf course superintendent of Poppy Ridge Golf Course in Livermore, Calif., says he's always mindful of the amount of chemicals he uses. During the past few years, he has changed his fertility programs.

"We use a lot more foliar applications with sulfates because it helped us firm up our surfaces and helped with silvery thread moss control," he says. "We're using programs developed by a consultant to get rid of moss and firm up putting surfaces at the same time."

Before the past season, Cook mainly was using granular applications once a month but felt it wasn't giving him the best bang for his buck.

"The foliar application actually is less than granular," says Cook, a 12-year veteran who grew in Poppy Ridge. "The raw materials are less, and labor is probably a wash. Now, we're putting on foliar applications every two weeks. Our greens have really improved. They're a lot firmer and faster and more consistent."

Opened in 1996 and designed by Rees Jones, Poppy Ridge is a sister course to Poppy Hills and owned by the Northern California Golf Association. It hosts some of the NCGA championships. But the one drawback to having firmer, faster greens is the loss of pin placements during competition.

"We have a couple of greens that are really undulating, so we've lost a couple of pin positions," Cook says, noting the trade-off is worth it. "Only when the greens were brand new were the greens any better. This summer, we're going to raise the mowing heights so we can keep the speed at a reasonable level. We have to work around the spots and not use them on our heaviest play days." **GCI**

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At Salishan Spa & Golf Resort, Ryan Bancroft and his maintenance crew started fairway topdressing in 2000 on five holes and since have expanded the practice considerably. Photo: Salishan Spa & Golf Resort

GAINING ACCEPTANCE

SUPERINTENDENTS WEIGH THE **PROS AND CONS** OF FAIRWAY TOPDRESSING

BY MICHAEL COLEMAN

Topdressing fairways is gaining acceptance among more golf course superintendents these days, but not everyone is jumping on the bandwagon. With more pros and cons than the San Quentin Pro-Am, topdressing fairways has become a frequently discussed topic among superintendents. While accepted for years as a needed practice for greens, topdressing is becoming more popular on fairways with some superintendents.

At Saratoga National Golf Club in Saratoga Springs, N.Y., golf course superintendent Joe Lucas started a topdressing program for fairways last fall, after extensive research about the practice and materials.

"We're built on a very heavy clay soil," Lucas says. "During the wet time of the year, the playing surface is soggy."

Lucas talked with USGA agronomists and turf consultants and decided topdressing would improve the fairways at the public course. The pros and cons stack up for Lucas like they do for many superintendents. Reasons for topdressing fairways include:

- Quicker-drying turf;
- Enhanced turf appearance;
- Improved playability;
- Firmer turf; and
- A reduction of earthworm castings.

On the flip side, there are multiple negatives to consider:

- Labor cost;
- Material cost and storage;
- The need to raise irrigation heads;
- Scheduling hassles;
- A higher risk of disease; and
- Root problems.

DRAINAGE CONSIDERATIONS

Although New York isn't like the Pacific Northwest where rainfall is measured by the foot each year, precipitation can be significant in the Empire State. Lucas, who has been at Saratoga National since construction in 2000, says the course drains well but more sand helps dry the playing surface much more quickly.

Tony Girardi, CGCS, at Rockrimmon Country Club in Stamford, Conn., decided against topdressing fairways because drainage was the real problem. During 13 years at Rockrimmon, Girardi also has seen layering problems appear on greens because of topdressing. Layering can lead to problems if the roots stop growing through the layers. He didn't like the idea of dealing with that potential problem on fairways.

"You're going to raise fairways and crown them," he says. "At this point, it's not really clear what impact topdressing will have on surrounding areas and the transition zones in the rough."

Rather than building up sand to improve percolation and water removal, Girardi suggests honing in on the real source of excess water – ineffective drainage. Girardi believes many courses aren't looking at the entire picture of what's happening in the fairways when they begin topdressing programs.

"You're actually masking an issue you have with drainage," he says.

Still, many other experienced superintendents tell Girardi they're having success topdressing fairways.

Drainage was Bob Senseman's first target, too. Senseman, a certified golf course superintendent at Oswego Lake Country Club in Oregon, has made four applications since October of 2006. Fairway topdressing has been going on for years at Oswego Lake.

"The program is most effective when you take care of the trouble spots with drainage," he says. "We're changing the program to one similar to putting greens in which we're doing lighter but more frequent applications of sand."

Consistency and firmness are types of playing conditions golfers at Saratoga National expect, and topdressing fairways and roughs helps Lucas meet those expectations.

"Happier golfers make for more revenue because they don't have to keep carts on the paths," he says.

The additional cart revenue is expected to help counter the $35,000 of materials cost for four or five applications annually, although Lucas isn't sure how many the crew will be able to actually complete throughout the season.

"It's a tough process to complete because something's always coming up," he says.

CHOOSING THE MATERIAL

Many superintendents don't have the money or time to topdress fairways. However, if they decide to topdress them, they need to make sure the material they use isn't going to worsen turfgrass conditions, says Jason Henderson, assistant professor of turfgrass and soil science at the University of Connecticut.

Obviously, worsening turfgrass conditions isn't one of the goals of topdressing fairways, so superintendents should have any materials they're considering using tested by an accredited laboratory for an independent recommendation. The cost of topdressing is too high to just jump in and use material from the nearest quarry.

Lucas talked to many people before decid-

Before applying topdressing to fairways, Ryan Bancroft's crew uses a core harvester with a modified conveyor that picks up cores and transfers them to another vehicle. Photo: Salishan Spa & Golf Resort

ing which sand he would use. He took samples from all the suppliers in the area, and Brookside Laboratories examined them for particle size, infiltration and other characteristics.

"It probably took me two years of sampling before finding something I was comfortable with and that came at a good price," he says.

Lucas spent about $9,000 for 634 tons of straight sand.

"It's a learning game," he says. "I'm just trying to figure it out for myself."

It took a while for Lucas to decide what to use because of long-term effects.

"I don't want to throw something out there that five to eight years down road could be hindering me," he says.

Negative outcomes are a possibility because the practice is so new in most areas, Henderson says. Once sand begins to settle into the turf after several applications, one starts to see changes in the infiltration rates and moisture levels.

Henderson is working on a study at the University of Connecticut that examines how various topdressing sands react with soil. His study includes USGA-spec sand, fine sand and course sand. He hopes to learn more about how each type of sand interacts with soil and what results might be seen in practical applications.

"The big challenge – the unknown right now – is once you've built up this layer of sand on top of this finely textured soil, how's it going to change how that soil reacts to various soil moisture conditions?" he says.

CONCERNS

The uncertainty of the long-term effects of topdressing fairways worries some superintendents. Not everyone is comfortable with some of the risks posed by it. For example, during a storm, normal surface runoff occurs at a high rate. But with sand present after topdressing, water goes through the permeable sand to the root zone. Depending on the depth of topdressing, the soil might remain saturated, especially after a heavy rain. If a big rain is followed with extreme heat, it's a potentially lethal combination.

"You can literally cook the roots," Henderson says.

The possibility of extreme conditions causing havoc increases with a regular topdressing program. Higher soil temperatures are detrimental in wet conditions – harsher than ambient air temperatures on the health of the turf.

"Do you essentially create the perfect storm scenario in which you get higher infiltration rates, but increase risk in terms of disease susceptibility and a lot of potential for direct injury kill?" Henderson wonders.

Henderson's concern is echoed by those in the field, such as Senseman, who recognize the potential danger.

"You put down a lot of sand, and you can fry things in a big hurry," says Senseman, whose budget for fairway topdressing materials is $30,000 a year, which costs about $15 a ton.

Another considerable drawback that becomes apparent as time progresses is the need to raise irrigation heads. Several superintendents that are topdressing expressed their concern about that problem. Unfortunately, that's one of the prices to be paid for the benefits of topdressing.

FULL STEAM AHEAD

While the negatives of topdressing can be daunting, some course managers begin to see the benefits slowly and continue to ramp up their programs. Ryan Bancroft, golf course superintendent of the course at Salishan Spa & Golf Resort in Gleneden Beach, Ore., has a staff of nine full-time employees and 10 part-time employees. Bancroft and his crew started topdressing in 2000 on five holes and then started applying heavier applications twice a year in addition to

The pros and cons of fairway topdressing

PROS

- Quicker-drying turf
- Enhanced turf appearance
- Improved playability
- Firmer turf
- A reduction of earthworm castings

CONS

- Cost of labor
- Material cost and storage
- The need to raise irrigation heads
- Scheduling hassles
- A higher risk of disease
- Root problems

Topdressing treatments are applied across multiple fairways to compare effectiveness of different topdressing frequencies. Photo: University of Connecticut

one light application. His topdressing materials budget for the year is $55,000, and there's not much acreage neglected by his crew.

"We throw sand everywhere," Bancroft says. "It's on the fronts, it's on the greens, the tees, fairways and some of the high-traffic rough areas."

Bancroft favors topdressing to help percolate water and prevent thatch layers in the turf. The main reason he topdresses the fairways is because of drainage. The course receives 80 to 100 inches of rain annually. He's hoping to get close to six inches under the surface to improve drainage and stretch the prime season.

At Salishan, nine holes close so the crew can aerify and then topdress. The process allows the crew to work a regular day, which reduces overtime and fatigue. It also allows nine holes to remain open each day and keep revenue flowing.

Ingenuity kicked in to help speed up things for Bancroft. His crew uses a core harvester with a modified conveyer that picks up the cores and transfers them over the bed where they fall into a transfer vehicle. When that vehicle is full, an empty vehicle takes its place to keep up the pace. The process reduces the time required almost in half.

"I'm actually going to try a once-a-month application this year," Bancroft says, adding that he's planning for two moderate applications and four or five light applications. "We're just going to put a lighter amount down so it doesn't affect the golfers as much."

Senseman's crew is taking a similar approach – more frequent light applications.

"We have a program in which we're just sanding two to three fairways a day," Senseman says. "It takes us a week, and we wait three to four weeks and start over again."

While the drawbacks can be significant – some might not surface until the practice matures throughout the years – some superintendents stand by topdressing fairways as a sure way to improve conditions for demanding customers.

"The standard expectations for the golf course are continually being elevated," Senseman says. "Any kind of light-frequent topdressing you can afford to do is only going to improve the condition of the golf course." **GCI**

Michael Coleman is a freelance writer based in Kansas City. He can be reached at mike.coleman@comcast.net.

At Oswego Lake Country Club, Bob Senseman and his crew have made four fairway topdressing applications since October 2006. Photo: Oswego Lake Country Club

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New bentgrass sod was installed around an oak tree on the fairway of the 14th hole, which now offers members multiple shot options off each tee. Photo: Flossmoor Country Club

BACK TO ITS ROOTS

FLOSSMOOR RECAPTURES ITS CLASSIC PAST BY RESTORING ITS GOLF COURSE

BY MARK LESLIE

Etched in the history books with indelible connections to venerable golf icons Bobby Jones and Chick Evans, 105-year-old Flossmoor Country Club is in the midst of a remodeling project that's expected to return it to its heyday.

Before 1962, Flossmoor hosted major events including five Western Opens, five Western Amateur Championships, two USGA National Amateur Championships and one PGA Championship. Members want to rekindle that glory and prepare the course for the future without tearing it up, says green chairman Mark Egge.

To meet that objective, the club engaged Holland, Mich.-based golf course architect Raymond Hearn, an expert in classical golf course architecture who has restored a number of courses built during what's known as the Golden Era of golf course design.

"None of the members were interested in getting a modern marvel," says club president Nick Zagotta. "They're happy to retain the classic character of the golf course. That's one of the reasons this plan was approved overwhelmingly – because we went back to our roots instead of trying to become something we're not.

"We're in one of the oldest suburbs in Chicago, one of the oldest golf courses in Chicago and one of the greatest properties in metro Chicago," he adds. "We wanted to embrace that."

Connecting to Flossmoor's history through this project, it was fitting that: