



Soil tests can reveal how many nutrients can be absorbed by the plant. And aside from existing conditions, organic material matters when building a green (below). It's important to make sure you get what you paid for and to have a neutral pH. Photos: Dakota Analytical



materials that cause issues."

It's also important to have a consultant who knows the area in which he's working.

"You don't want a consultant from Maine in Southern California," he says. "You have to understand fertilizers in the area and what the superintendents there have to work with."

#### A HEALTHY BALANCE

Soil tests generally take 48 hours or less, so superintendents can receive feedback quickly. That's imperative for Gill Stiles, superintendent at Santa Rosa (Calif.) Golf and Country Club.

"The analysis tells us the makeup of the soil," Stiles says. "Soil nutrient testing is done two or three times a year. That way, we get a take on nutrient availability, how much nutrients are in there and the pH."

Stiles pays particularly close attention to cation exchange capacity.

"Cation exchange capacity tells us how much of these nutrients can be absorbed by the plant," he says.

The nutrient absorption capacity of the turfgrass is another consideration.

"You have to have the nutrients in the soil and in the proper pH range for the plant to take up

the nutrients, and the cation exchange capacity monitors the soil to make sure you can do that," Stiles says. "All those things, if balanced properly, will make a healthy plant."

Stiles tests the same six greens each time to establish a baseline. That way, he can gauge the effectiveness of his nutrient program.

"We tend to be low on calcium, so we check the same area to see if our program is improving the situation or not," he says. "Our ultimate goal is to have the proper mixture."

There are times when Stiles receives analysis results and applies straight calcium on the greens to keep things balanced.

"We have a nutrient program we put on the course for the year, and we derive it from the soil tests," he says. "We adjust it and find products that meet those needs."

Stiles uses analysis to pinpoint his program.

"You can throw all kinds of stuff at the soil, but if things are out of whack, the plant can't take up nutrients," he says. "Just throwing fertilizer at a problem doesn't always fix it. It depends on what you need. Some nutrients are mobile in the soil and have to be replaced regularly. Others aren't so mobile and are available longer."

Stiles also must align his micronutrients and macronutrients properly. Nitrogen, phosphorous and potassium – the macros – need to be present. Micronutrients such as iron, copper, zinc, and many others must be present as well.

"It's very much a balancing act," he says.

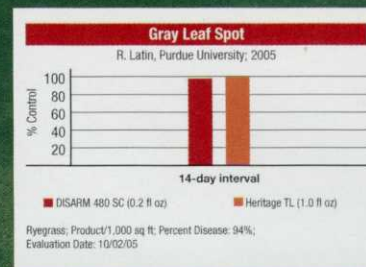
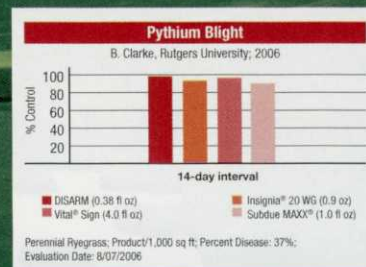
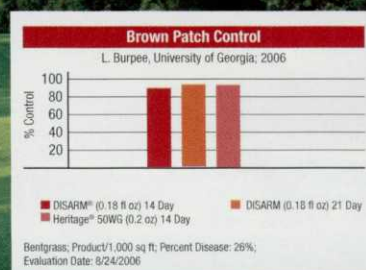
For Stiles, the analysis isn't an expensive line item in his budget.

"It depends on how extensive you want it to be," he says. "Several tests can be done, and ev-

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ery lab has its own price for its various tests.”

**IT'S A PH THING**

Mark Lilleberg, superintendent at Eaglemont Golf Course in Mount Vernon, Wash., doesn't test soil as often as Stiles. Instead, he tests every other year.

“It depends on when they want to give it to me free,” he says jokingly. “That's usually every other year.”

Lilleberg tests the same six greens, two fairways and several tees and averages the readings.

“I can't afford to do the whole deal,” he says. “Usually salesmen, the main suppliers of my fertilizer – micronutrients and macronutrients – do it for me. There are two labs, and I've used the one here in the Northwest.”

But Lilleberg isn't suggesting analysis is unimportant.

“I've never had a huge problem, so I'm not really troubleshooting,” he says. “But I like to get a rough idea of my copper, iron and calcium levels on the greens, in coordination with the pH. Mainly, it's a pH thing, but then you can look at your other nutrients and say, ‘How can I fix that?’”

It usually takes Lilleberg one growing season to make any considerable changes.

“You can't change your pH overnight and expect to have great things happen,” he says.

**ORGANIC MATERIAL MATTERS**

Aside from using soil analysis for maintaining quality turfgrass, it's also imperative to know the quality of the materials used when building a course, says Steve Christian, national account manager for East Grand Forks, Minn.-based Dakota Analytical, one of the seven USGA accredited labs.

For example, if a green is built to spec according to USGA recommendations and it's topped with straight sand for a while, the green's characteristics and needs change.

“Organic material matters – it's important to have a neutral pH,” Christian says. “It's buyer beware. You need to make sure you're getting the quality materials that you want in your course for the dollars you paid.”

Dakota Analytical can test for almost anything a client needs.

“We can look at core samples; do a physical workup; check organic content in the top, middle and bottom of the root zone; and do a full nutrient analysis,” Christian says. “Then you can tell them if they're using the wrong sand or not. For organic content in greens, you should have between 4 and 6 percent in the top of the root zone, and you should see how thick the thatch is. We help solve those problems.”

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## SOIL MANAGEMENT

Some grasses need fine sand, but fine sand is generally a problem, says Steve Christian of Dakota Analytical. Photo: Dakota Analytical

Most of the time, the problem Christian sees with samples is that too fine a grain of topdressing is used.

“Some grasses need fine sand, but in general that’s a problem,” he says. “You have to know what they’re growing things on. It’s very important to know the quality of the organic matter you’re using in topdressing. With drought conditions throughout the country, guys keep pouring on sand, and there’s no soil structure left. They put more water and fertilizer on. Good organics can help you hold water, a controlled hold, so now you’re building a soil structure in the root zone.” **GCI**



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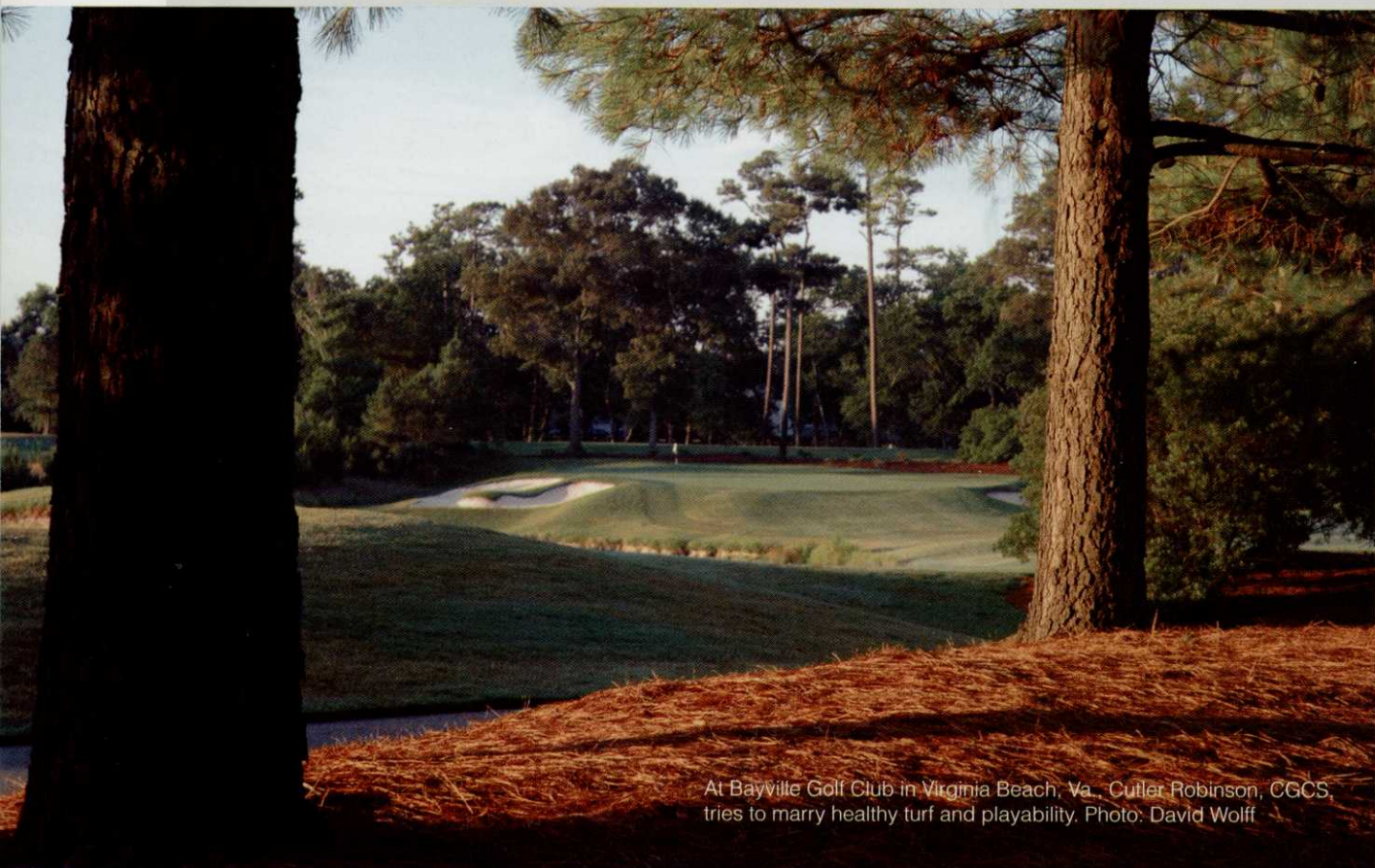
Expectations, weather and turf health determine the amount of chemical inputs

**G**olfer expectations and the weather. Arguably more than anything else, these two factors determine how superintendents prepare and maintain golf courses. And, depending on where you live, this has a great affect on the amount of chemicals used – fungicides, plant growth regulators and fertilizer, to name a few.

Regardless if the course is in the Pacific Northwest or along the Eastern Seaboard, superintendents agree the key to achieving the best possible conditions is establishing and maintaining healthy turf. Their methods might differ, but the goal is the same.

The use of chemicals such as fungicides is entirely based on the weather, says Darin Bevard, a U.S. Golf Association senior agronomist for the Mid-Atlantic region.

“In 2005, our region experienced a hot, wet summer,” Bevard says. “Most superinten-



At Bayville Golf Club in Virginia Beach, Va., Cutler Robinson, CGCS, tries to marry healthy turf and playability. Photo: David Wolff





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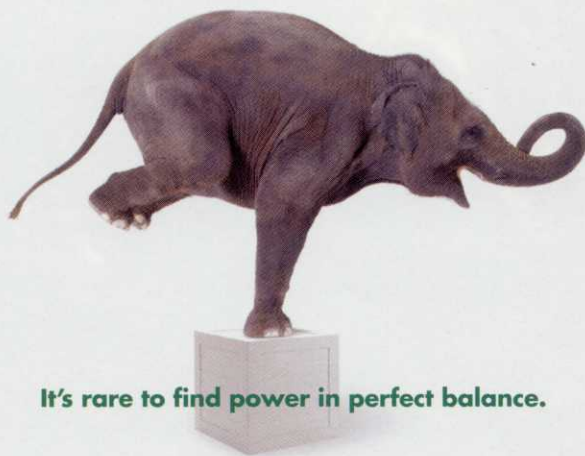
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## TURFGRASS MANAGEMENT

dents exceeded their chemical budgets. Last year was better, but costs increased because of price increases for these products. However, cost aside, superintendents generally will use as much fungicide as it takes to meet golfer expectations for course conditions."

### INCREASED FERTILIZATION

Kris Givens remembers when the approach to fertility programs for greens was "lean and mean" several years ago. Not so anymore for the superintendent of Whitford Country Club in Exton, Pa.

"Anthracnose is a bad disease in our area, and we have to control it," Givens says. "So part of our program is fertilizing at a higher rate than we used in 2000 and 2001."

The 18-hole private course has bentgrass/*Poa annua* greens and tees and bentgrass fairways. Givens uses EarthWorks 5-4-5 natural organic fertilizer. In the spring, early summer and fall, he applies one-half to one pound per 1,000 square feet and spoon-feeds at a rate of one-tenth of a pound weekly in the summer to maintain color and avoid flushes of growth.

To maintain healthy turf, Givens' fungicide program includes monthly applications of a Signature/Daconil mix or a Signature/26GT mix from March through November. In the summer, it can get hot and humid, so Givens usually sprays something every two weeks to help him manage disease. Golfers don't even notice, he says.

"We rotate Banner Maxx and Rubigan among other SI fungicides and apply Primo plant growth regulator every two weeks to maintain green speed," he says. "We have a good fertilizer program with a strong rotation, and we're hitting everything from dollar spot to summer patch to pythium. We really haven't had any issues. In the summer, we have to pay attention and be smart. If the weather changes, we might have to raise the height of cut on the greens and back off on double-cutting."

### CHANGE IN SCENERY

When Chris Kirchner left Highlands Falls (N.C.) Country Club to become superintendent of Heritage Hill Golf Club in Shepherdsville, Ky., he experienced more than a geographical change. Nestled in the Great Smoky Mountains, the Highlands Falls course is at an elevation of more than

At Heritage Hill Golf Club, Chris Kirchner rotates 10 to 15 different fungicides on greens to prevent tolerance build-up. Photo: David Wolff

