

A NUTRITIONAL BALANCE

Soil tests pinpoint subsurface needs. By T.R. Massey

There are many nebulous factors working in tandem when keeping turfgrass healthy. Water, fertilizer, pesticides and mowing programs are important. But looking out over a verdant stretch on a golf course tells only part of the story of what's happening with the turfgrass growing there. The true tale lies in the soil beneath the surface.

For a healthy turf stand, the soil must be in proper balance, and even more important are the nutrients contained therein. The proper mix of food for turfgrass plants must be in harmony. This is determined through soil and nutrient analysis – an effective tool used by superintendents.

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Laboratories can analyze soil for pH, magnesium, phosphorus and salt levels. Photo: Dakota Analytical

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SOIL MANAGEMENT

(SOIL MANAGEMENT continued from page 34)

Having analyses conducted regularly can mean the difference between a green course and one with dying turf.

Mark Flock, a laboratory manager and agronomist for Brookside Laboratories in New Knoxville, Ohio, attests to the importance of testing soils and nutrients. Brookside is one of the seven labs in America accredited by the U.S. Golf Association that test construction materials for fairways, greens and tees (for those courses built in accordance with USGA specification). They test grounds for about 3,000 golf courses through 260 consultants and 36 universities throughout the world. Brookside also tests soils for municipalities, farmers, athletic facilities and others growing grass.

"We do soil testing for fertility, plant testing, compost testing, water and drainage testing," Flock says. "Through consultants, we keep grass healthy. It's really important to know what you have. Testing helps do that."

The standard is to test tees, greens and fairways – fairways can be split depending on slope

and condition.

"We analyze for pH, magnesium, phosphorous, salt and other things that give you a really good picture of what is going on," Flock says. "In dry periods, it helps you head off any issues before they happen."

Brookside also can test for fungicides, insecticides or herbicides to see if they're in proper balance. The lab supplies packages containing screen tests that show what's applied to turf isn't running off into the streams on or near the golf course.

Soil tests are based on the regions of the world from which they originate.

"It comes down to the type of grass and weather," Flock says. "There are lots of salt issues in the South and West. Water dictates issues. Drier regions are being forced to use effluent water, and water dictates chemical status of soil. You have to stay on top of it. Having someone taking soil, water and turf samples to see if the grass is healthy, those are three you can't do without. You have to know what's in everything after that, such as adding compost or manure. These are things consultants know. They won't use

Soil tests generally take 48 hours or less, so superintendents can receive feedback quickly. Photo: Dakota Analytical





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.

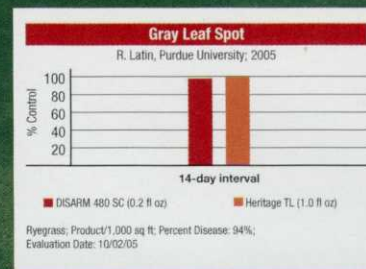
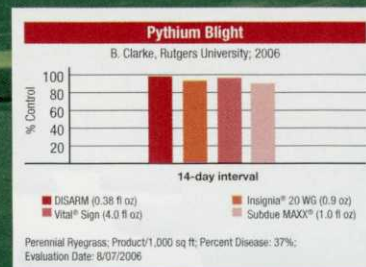
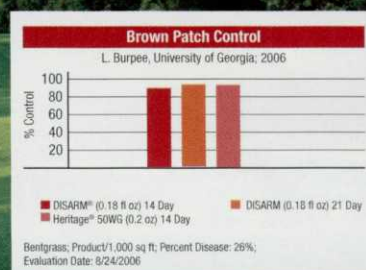
For Stiles, the analysis isn't an expensive line item in his budget.

"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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