

Soil sensor manufacturers say their technology will help superintendents better understand what's going on below the ground.

Makes Sens-ors

New technology gives information to help superintendents make better water-management decisions

BY ANTHONY PIOPPi, CONTRIBUTING EDITOR

Water is the big issue for many golf courses, what with the belief among superintendents that one day there might not be enough of it for irrigation. But not according to Robert Criste, vice president of sales for Golflinx, a manufacturer of soil sensors.

"It's not a water shortage issue; it's a water management issue," Criste says, echoing the words of the other two companies — Advanced Soil Technology and The

Toro Co. — that also produce soil sensors for the golf industry.

Criste insists there is enough water, no matter what part of the country, if the water is used correctly.

To that end, the three companies have entered the golf soil-sensor market in the last three years with devices they say will allow superintendents to better understand what's going on below ground and ultimately lead to a reduction in water usage and pesticides as plant health increases. Joining Golflinx, an Australian company

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and manufacturer of soil sensors for the agriculture industry, is Advanced Soil Technology based in King of Prussia, Pa., and Minneapolis-based Toro, which purchased Turf Guard wireless technology in December. Turf Guard will remain based in California.

While the industry might be small and in its infancy, it is not without acrimony — AST has sued Toro for theft of intellectual property and patent infringement, to which Toro responded by denying the accusations and countersuing.

The technology works this way: sensors, about 1-foot long, are placed somewhere between 2 inches to 4 inches underground on various areas of the golf course to measure soil

moisture, temperature and salinity at a variety of levels.

The information is relayed back to a base unit via repeaters mounted on irrigation control boxes, allowing the superintendent to monitor each unit and the three categories of information it is sending back.

Since each sensor has multiple nodes, there is a multitude of information. The AST and Toro models are wireless and battery-powered and, therefore, can be repositioned. The Golflix model is wired into an irrigation pedestal and AC-powered.

Perhaps fewer than 100 courses around the country use sensor technology, but the superintendents at those courses say the information they are

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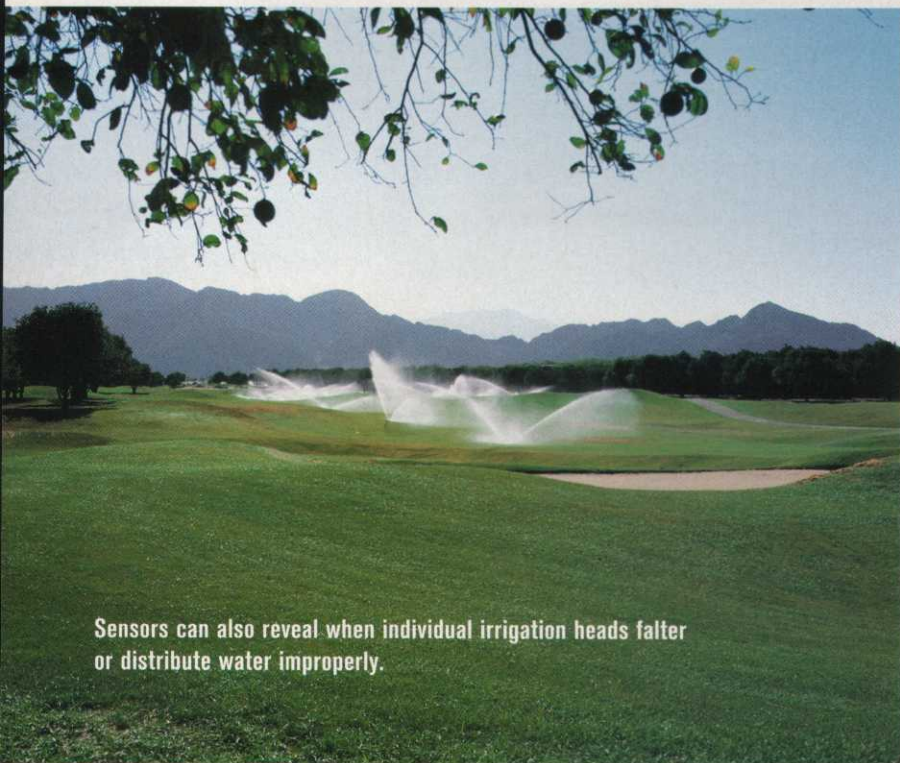
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Soil sensors can also be used on problem tees. As on greens, soil sensors can benefit microclimates where shade might influence irrigation.

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Sensors can also reveal when individual irrigation heads falter or distribute water improperly.

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getting has led to substantial water savings and healthier turf.

David Major, the certified superintendent at Shady Canyon Golf Club in Irvine, Calif., has been using soil sensors for almost three years, acting as a test site for Turf Guard products (now Toro). The Tom Fazio-design, which sees more than 30,000 rounds a year, is built on poorly draining soil and is irrigated with effluent water.

"That's our biggest challenge in Southern California — reclaimed water and tight soil," Major says.

He has probes, 90 in all, placed in greens, tees and landing areas as well as a few unexpected locations. Major uses one probe to monitor the soil around a newly planted palm tree, and another floats in a holding pond to monitor water quality.

At the six-course Desert Mountain Golf Club near Scottsdale, Ariz., director

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Shawn Emerson, watching while Dr. James Beard examines a plug of turf, says sensors have enabled him to reduce water usage by up to 15 percent.

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of agronomy Shawn Emerson has AST sensors in place on his Geronimo Course. Since installing them, he says he has cut down on his water usage by 10 percent to 15 percent. Much of the savings has come from his reduction in water used for flushing of greens.

According to Emerson, because of the poor quality of his effluent, flushing greens to keep salts and other impurities from building up is vitally important for healthy turf.

Prior to the sensors, Emerson made sure to err on the side of too much water rather than too little when flushing his greens. The sensors, he says, not only allow him to monitor the accumulation of salt and let him know when to flush greens, but also let him know when the salt level has been reduced enough for him to stop the process.

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PHOTO BY: STUART BUCK

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"What I believe these things do is give you information that lets you make better decisions," Emerson says.

He has 24 sensors in use at Geronimo. The diameter of each sensor is smaller than a golf hole, so Emerson moves them around using a cup cutter.

The biggest surprise Emerson says he found once the sensors were in place is how much the soil conditions of his greens evolved depending on the season.

"What I believe these things do is give you information that lets you make better decisions. ... They don't replace observation, but they give me a heads up to look for things."

SHAWN EMERSON,
DIRECTOR OF AGRONOMY,
DESERT MOUNTAIN GOLF CLUB

"It changed dramatically during the year as the sun angles and shade angles changed," Emerson says.

Walt Norley, president and CEO of AST, said this is a prime example of what sensors do — provide superintendents with knowledge they would not otherwise have.

"It's information technology," he says.

Norley points out that most courses with poor-quality effluent water flush on planned cycles without knowing how much of the impurities have built up. Because water quality vacillates, sensors let the superintendent know

when it is time or, just as important, not time to flush greens.

The technology is not just for arid areas. Manufacturers say sensors can detect if pesticides and soil surfactants are present. And in areas of the country where rain is plentiful, soil sensors can prevent superintendents from irrigating when turf contains the correct amount of moisture.

"It gives me really good information on infiltration rates and leeching," Major says.

Because the sensors do not shut off, they will also reveal when individual irrigation heads are working improperly, putting out too much or not enough water.

David Angier, marketing manager of golf irrigation for Toro, says many courses start with a three-hole package of sensors, which is recommended by all three manufacturers as a good place to begin. Once superintendents become familiar with the technology and as their maintenance budgets permit, they can add more sensors in different areas.

The majority of the courses that have purchased the sensors are high-end and have bought three- or six-hole packages. A three-hole package, including installation, costs between \$15,000 and \$20,000 depending on the manufacturer.

Sensors are most commonly used in problem greens, tees and, for layouts that host tournaments, landing areas. The manufacturers say their sensors are compatible with any irrigation system.

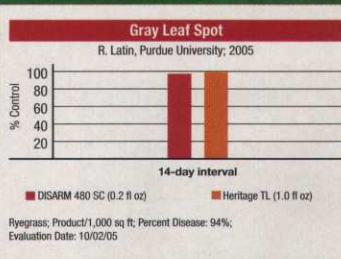
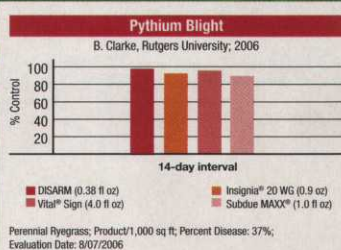
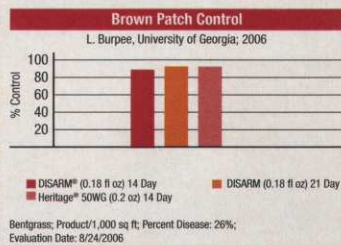
Manufacturers do warn that the sensors must be protected from aeration spikes, which would destroy the units upon contact.

As Emerson sees it, sensors are another weapon in his turf-maintenance program.

"They don't replace observation," he says, "but they give me a heads up to look for things." ■

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