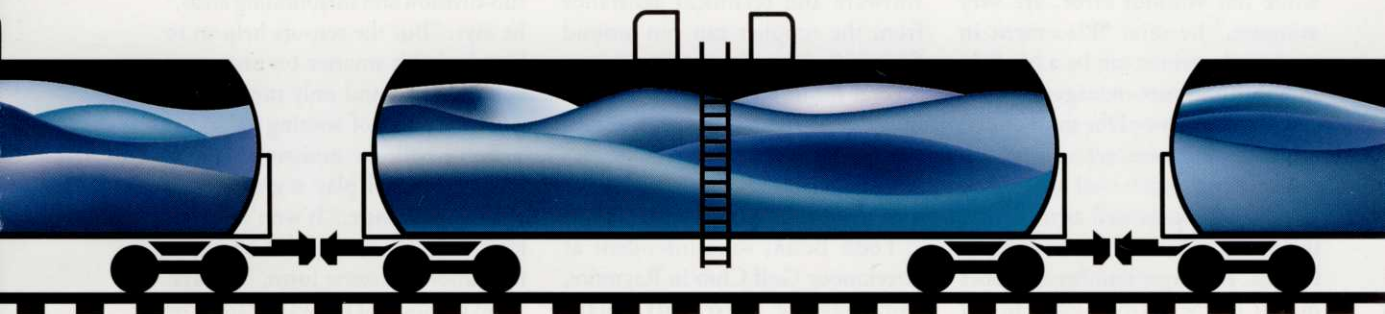


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SMART IRRIGATION

greens, two tees, and one fairway and is getting ready to expand to a couple more greens.

"I look at it as another tool," he says. "Being cognizant of what moisture it takes to grow quality grass changes how the super waters and manages his turf." UGMO charges Bladen a fee to monitor the moisture through their technology and internet. "The readouts from the sensors, while not without error, are very accurate," he says. "Placement in strategic locations can be a big help in water/moisture management."

Accuracy is one of the most crucial elements of a moisture sensing systems. Therefore it is vital to properly install and use, as well as maintain, the sensor's "stems" for maximum benefit. The larger number of probes placed in the earth – generally at between 5 inches and 5 feet in depth – the more comprehensive the pic-

ture becomes for the superintendent. However, placing a large number of probes in the ground is labor intensive and impacts a system's return on investment. In addition, regular inspections, maintenance, as well as the occasional replacement are required to keep the system running smoothly.

A system that includes 18 wireless sensors, three routers and gateways, software and technical assistance from the supplier can run around \$12,000. But if a facility saves several hundred thousand gallons of water or more a year as a result, the savings versus investment and upkeep is quite impressive and quickly noted.

Todd Bohn, superintendent at Creekmoor Golf Club in Raymore, Mo., has the Toro Turf Guard system set up on three greens and it allows him to see what is going

on below the surface. It reports to him when a green reaches a certain moisture level and whether he needs to add water to keep it from wilt-



Bohn

ing. "Water costs for me aren't a huge thing because I have a 118-acre lake that catches all the runoff from a sub-division and surrounding areas," he says. "But the sensors help us to be a little bit smarter on our water consumption and only use it as we need it instead of wasting it."

Bohn believes moisture sensing equipment will play a greater role in the near future. "It won't be that long before we are all under water regulations of some form," he says. "This equipment is a way I can show my watering practices aren't wasteful, and I can track the temperature

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and moisture levels in my greens at the same time.”

Superintendents should make sure their sensors communicate and are free of obstacles – such as trees, houses or mounding – that could inhibit information transmission. Most manufacturers have equipment that, for an added cost, will troubleshoot these problems, Bohn adds.

Michael Swing, CGCS, Visalia Country Club, Visalia, Calif., has a few reservations, such as: How long will the sensors last; how much sensitivity is lost over time; what is the cost of replacement and the labor cost of replacement; how does deep tine aeration affect the sensors; what are the difficulties in troubleshooting failures; will adding sensors add to potential rebates from state and utility companies?

“Most if not all of these questions will be answered by golf courses that

are currently using these devices over a period of time,” he says. “To rely on promotional material is a big risk because much of the information is largely overstated and of no value. Even with a proven product, you still deal with different soil profiles, exposures, traffic patterns, elevation changes, to name a few. Sensors are tools, much like our on-site weather station.”

Cost is a factor as well as placement as it relates to cultural practices, such as aeration. “Some operations will be able to integrate this type of system very easily,” Bladen says. “Others will simply gather the data and still use the old soil probe and seasonal watering cycles they have used for years. This is not a one-size-fits-all



Swing

technology and I have several concerns about removing too much of the human element away from the cultivation of quality golf turf.”

Scott Sewell, CGCS, Emerald Bay Golf Course in Destin, Fla., anticipates purchasing sensors in the near future. “I manage two golf courses that are three miles apart and it would be a great tool on days when I just can’t see everything on both courses,” Sewell says.

“I want to irrigate only when I have to and the sensors would be very instrumental in helping me do that,” he adds. “My courses are on reclaimed water, but it is not unlimited in amount, so I need to use it wisely. Knowing moisture levels throughout the course would help me save water and energy.” SI

John Torsiello is a freelance writer based in Torrington, Conn.

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IRRIGATION ISSUES A SALTY OPTION



Erik Christiansen

Erik Christiansen is a licensed irrigator and president of EC Design Group, an irrigation consulting and water management firm based in West Des Moines, Iowa. A board member for the American Society of Irrigation Consultants, Christiansen can be contacted at erik@ecdesigngroup.com.

For those of you who remember the '80s and early '90s, the first thing a golf course design firm would ask a prospective client was simply, "Do you have the enough land and financial capability to build a golf course?" Today the first question is the above and, "Do you have the quantity and quality of water needed to support a golf course?"

Water certainly has become the most important factor in, not only building new courses, but sustaining existing ones. There are hundreds of courses around the U.S. that 30-plus years ago had an abundance of water – whether that source was groundwater, rivers or lakes – or in some cases potable water, which in some regions has become a public relations challenge.

What happened to all the water? Statistics state the same water that was on the earth billions of years ago still exists today and covers most of the earth. However, only 3 percent is fresh water, and most of that is in the form of ice. Today, less than 1 percent of all water is readily accessible for human use, and less than 0.007 percent is available and suitable for drinking.

In the 20th Century the world's population tripled, but the use of water grew by a multiple of six. It's been said that we could run out of usable water before we run out of oil (my friends in West Texas might argue against that, but I digress). Therefore, we have to act responsibly when using this resource and use it wisely.

Today, governing agencies in many states are restricting water use from the very sources that we generally depend on. Throw in a drought situation, and these sources can be severely limited by those governing them. The first uses typically restricted are light industries, like car washes, but then parks and golf courses enter the fray.

We are certainly in a time when it is important to find alternative water sources to sustain golf for the future. Just a few years ago, effluent water was free; municipalities and water treatment facilities just needed to find a home for this source. Now this water is becoming a tight commodity and in many places can be quite pricey (if accessible). I guess someone discovered a profit center . . .

So what are our options? The only remaining option is to turn to water no one else wants – like brackish water found in wells in certain parts of the country and salt water from the ocean itself. Breakthroughs

in new salt-tolerant turfgrasses for warm season areas, such as Seashore Paspalum (*Paspalum vaginatum*), are enabling us to use water sources that we wouldn't even have considered 10 years ago. It should be noted that these grasses may not be the end all, but they give courses another vital option not previously available.

Because this is more about irrigation, I will leave the soil chemistry to agronomists and concentrate on information about water resource options. Let's start with the worst case scenario – using sea water.

Typical sea water has a salt content of 34,560 ppm. Obviously no turfgrass can handle straight sea water. So what are our options? The first is to blend sea water with fresh water, and you should definitely consult the previously mentioned agronomists to determine if this is practical.

Willie Slingerland with ITT Flowtronex states... "Another option is reverse osmosis, also known as RO. In many coastal areas today, like the Caribbean and desert areas in Egypt, have turned to RO. The greatest positive of RO is that virtually most any quality of water can be turned into an usable drinking and irrigation source. However, this type of treatment comes at a very healthy cost."

Slingerland went on to say that: "Using reverse osmosis involves the initial equipment purchasing cost required to pull from the source, pre-filtration, the RO unit(s) and the cost of the pump system for distribution through the irrigation system. Then, there is the disposal of reject material, operating cost for electricity and maintenance, which can run into the hundreds-of-thousands-of-dollars per year."

"In addition to production and maintenance costs, there are other factors to consider. RO water is very pure; the RO process removes all minerals and metals from the water. When this pure water source comes into contact with metals in pumps, station piping and irrigation fittings, it wants to pull these metals back into the treated water, causing corrosion in an irrigation system. Your pump station also can be exposed to salinity in the air, which can add cost to the typical station."

Reverse osmosis could be a viable solution, but do your homework first and consider all of the costs and side effects attached to the process. Whatever your situation, tap into experts to find a solution that best fits your budget needs, resources and site conditions. ■

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ALL WET

Brittany Schmigel

Correcting the problem of hydrophobic soils, superintendents utilize wetting agents to lower irrigation costs.

While their costs, products and application methods vary, many superintendents agree wetting agents greatly improve hydrophobic soil conditions. And it doesn't hurt that the agents help save water, either. They've become widely popular throughout the industry as supers realize their numerous benefits. GCI interviewed four superintendents who shared which products improve greens, cut costs and help the environment.

Brian Anderson, CGCS, Nema-colin Woodlands Resort in Farmington, Pa., realized he needed wetting agents during an extremely dry season. "No matter how much we would water, we couldn't get it through," he says. "One of my distributors had recommended trying them (wetting agents) and we noticed a difference immediately."

Anderson uses Aquatrols' Revolution (every 30 days on sand-based greens), Primer (every 30 days on

tee boxes and approaches) and injectable Dispatch (every irrigation cycle). "I always say they make water, wetter. That's kind of the way that I see it," says Anderson, who on an annual basis spends \$17,000 on wetting agents for 36 holes and two practice facilities.

Not only do the products improve the course, but the Dispatch cuts down on Anderson's work, too. "Our savings is man power, No. 1," he says. "You can set the

Wetting agents helps move water throughout the soil profile, so golfers can play quicker – even during wet periods.



timer on the pump and as you're watering, put it (Dispatch) out."

Dispatch has worked so well Anderson now utilizes it seven months out of the year. "A lot of people like to use it only during the summer months, but the benefits (when using throughout the year) are two-fold: It gets you through the dryer periods; and it gets you through the wetter periods," he says. "When you have a rainy season, a lot of guys don't like to turn the water on. But I think there's a lot of validity in utilizing Dispatch in April through October. Even if the turf might not be dry, we find that it allows us to open up the cart traffic quicker after a rain event, than if we weren't using it." He says wetting agents helps move water throughout the profile and evacuates it, so golfers can play quicker – even during wet periods.

While others may use wetting agents only during certain seasons, Anderson's unique approach isn't incorrect. Andy Moore, director of marketing and business development for Aquatrols, says water repellency is becoming recognized as a regular, every day problem and is no longer considered an "it shows up now and then" exception.

"People are realizing varying levels of water repellency exist, that's the norm of life. So it makes sense to manage it on an ongoing basis," he says. "Whether it's wall-to-wall or spot treatments, more and more superintendents are using them for water conservation and management. They can see the results and see that they're also water management tools as well." There's often a 30 to 50 percent reduction in irrigation when using wetting agents, especially

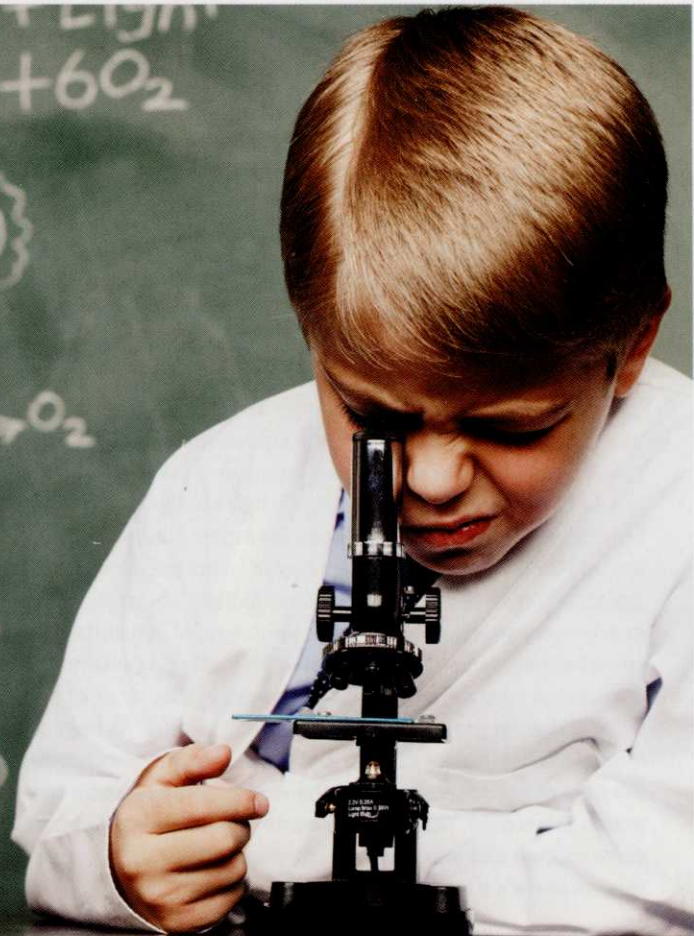


Which turf sample had a wetting agent? Here's a hint, it's not the one on the left.

injection treatments. "It translates back to the cost of water and energy, it adds up," Moore says.

Wetting agents allow Tony Grasso, superintendent at Metropolis Country Club, White Plains, N.Y., to water less. "I save water by not having to syringe during the day," he says. "When I can turn the sprinkler on for seven minutes instead of 10 minutes, that's a 30 percent savings."

Putting on
a white coat
doesn't really
make you an
EXPERT.



SMART IRRIGATION

Grasso treats his fairways, greens and tees from May through October with an injection and treats localized dry spots with pellets. "It's the best way to go," he says. "It's expensive, yes, but in the long run it's not any more expensive than anything else we do." While he declined to specify a brand, Grasso spends \$3,000 per year on wetting agents.

"A good golfer doesn't want to play on a wet turf and there's a fine line between wet turf and healthy turf – so that's what we try to achieve. It's a great tool," says Grasso, who has been a superintendent for 30 years and has had considerable experience using wetting agents. "A lot of different ones have come and gone, but there are a lot of great products on the market. Some are more expensive than others, some work better than others. You got to find which one is best for you," he says. And it seems like he's found what works best for him. "I don't get any puddling or squishiness when I ride around in the morning – that's a plus for golfers," he says. "You want the water where



More superintendents are using wetting agents for water conservation and management.

the roots can use them, not on the top – and you're always trying to get a dry cut, so you're trying to get the water off the surface as best you can. We were also trying to get the insecticides down into the soil... The more we used them (wetting agents), the more uses we found for them."

Moore agrees. "When it comes to really treating the golf course wall-to-wall, the best way is through injection with the irrigation system – this is where fertigation comes into play," he says. "In that way, they're able to treat the entire golf course affordably and enhance water penetration and distribution, with virtually no labor. And that's where you see significant savings on water and energy."

Jim VanHerwynen, CGCS, South Hills Golf and Country Club in Fond du Lac, Wis., began utilizing John Deere's LescoFlo and Aquatrol's injectable Dispatch and Revolution when water would not penetrate his course's heavy clay soil. "We have native push-up greens and the rest of the property is clay soil, so it's either too wet or too dry, that's why we went to wetting agents to balance it out." VanHerwynen uses Revolution (once a month, from April through September) on greens, collars and approaches. He uses injectable Dispatch wall-to-wall (in the spring and fall) and LescoFlo (once a year, in June) on fairways, intermediate roughs, tees, green mounds and driving range tees.

"When the soil got dry, you almost had to saturate it before you could

Soil becomes hydrophobic because of a variety of naturally occurring processes, says Andy Moore, director of marketing and business development for Aquatrols. Plants exude compounds out of their roots and microbes excrete waste products as they chew up organic matter in the soil. These substances, called organic acids, coat the soil with a waxy material. "These compounds can become very water-repellent and can cause these problems," he says. "You get this coating on soil particles that block where water would naturally attach, so that's specifically what the soil wetting agents are addressing. They come in and treat that coating and allow it (the soil) to become wettable." Moore, whose father began Aquatrols in 1955, says it wasn't until the mid-70's that turf managers began to embrace soil wetting agents. "It took time to get people to believe," he says, adding now nearly every superintendent uses some type of soil surfactant. And as superintendents use them, they realize wetting agents not only improve the soil but reap other benefits and savings, too. "A lot of people are using a regular program on their greens," he says. "A huge area of money savings, water savings and environmental stewardship is through the idea of injection – treating the vast majority of water that gets put on the course. That's a big step toward reducing water and energy consumption and market research shows that only 30 percent are doing this, so there's a lot of room for improvement."