



WATER WISE

The World of

Water flies at the North Shore Country Club in Northbrook, Ill.

What will golf course irrigation look like in 2025?

BY LARRY AYLWARD, EDITOR IN CHIEF

While tending turfgrass in parched Southern California for the past decade, longtime golf course superintendent Bruce Williams has realized more than ever how vital it is to manage water properly.

"Water is an extremely precious commodity," says Williams, the director

of golf courses and grounds for the Los Angeles Country Club. "Probably the most-important thing we do on the golf course every day is manage the water."

It is this mindset that more golf course superintendents, whether they hail from arid Arizona or waterlogged Washington, must grasp in the future. If they think the freshwater shortage is serious now, just wait until 2025. If they think their irrigation practices are being

scrutinized now, just wait until 2025.

Unless the world's population acts swiftly, the United Nations predicts that two-thirds of the world's population will live in countries that face serious freshwater shortages in 2025. In America, at least 36 states expect to face water shortages within the next five years, according to a report from the U.S. Government Accountability Office. When one hears such alarming statistics, it's hard to consider where the

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Water^{to} Come

golf industry fits in the equation. Nobody will argue that healthy turfgrass is more important than healthy lives.

That said, golf will still be a viable industry in 2025, and golf courses will still use their share of fresh water. But how much fresh water they use in 2025 will depend more than ever on cost and availability. Golf courses' freshwater use could also diminish if they have more access to effluent water. And superintendents' water-management skills should improve immensely thanks to better technology.

Tomorrow's irrigation

In 2025, Matt Shaffer, superintendent of the Merion (Pa.) Golf Club, expects that authorities will allocate the amount of fresh water that golf courses can use for irrigation.

"It could get to the point where you're actually told how many acres of greens, tees, fairways and roughs you'll be allowed to irrigate," says Shaffer, adding that local water authorities in 2025 might also have the authority to turn off the fresh water flowing to a golf course if that course has used up its allocation.

"I'm sure they'll have some kind of automatic reading device that will be able to tabulate how much water we're taking out of an aquifer," Shaffer adds.

Mark Jarrell, superintendent of the

Palm Beach National Golf and Country Club in Lake Worth, Fla., has probably been through more water restrictions in south Florida the past few years than all Northern superintendents combined. Hence, there's one thing Jarrell knows about the future of golf course irrigation.

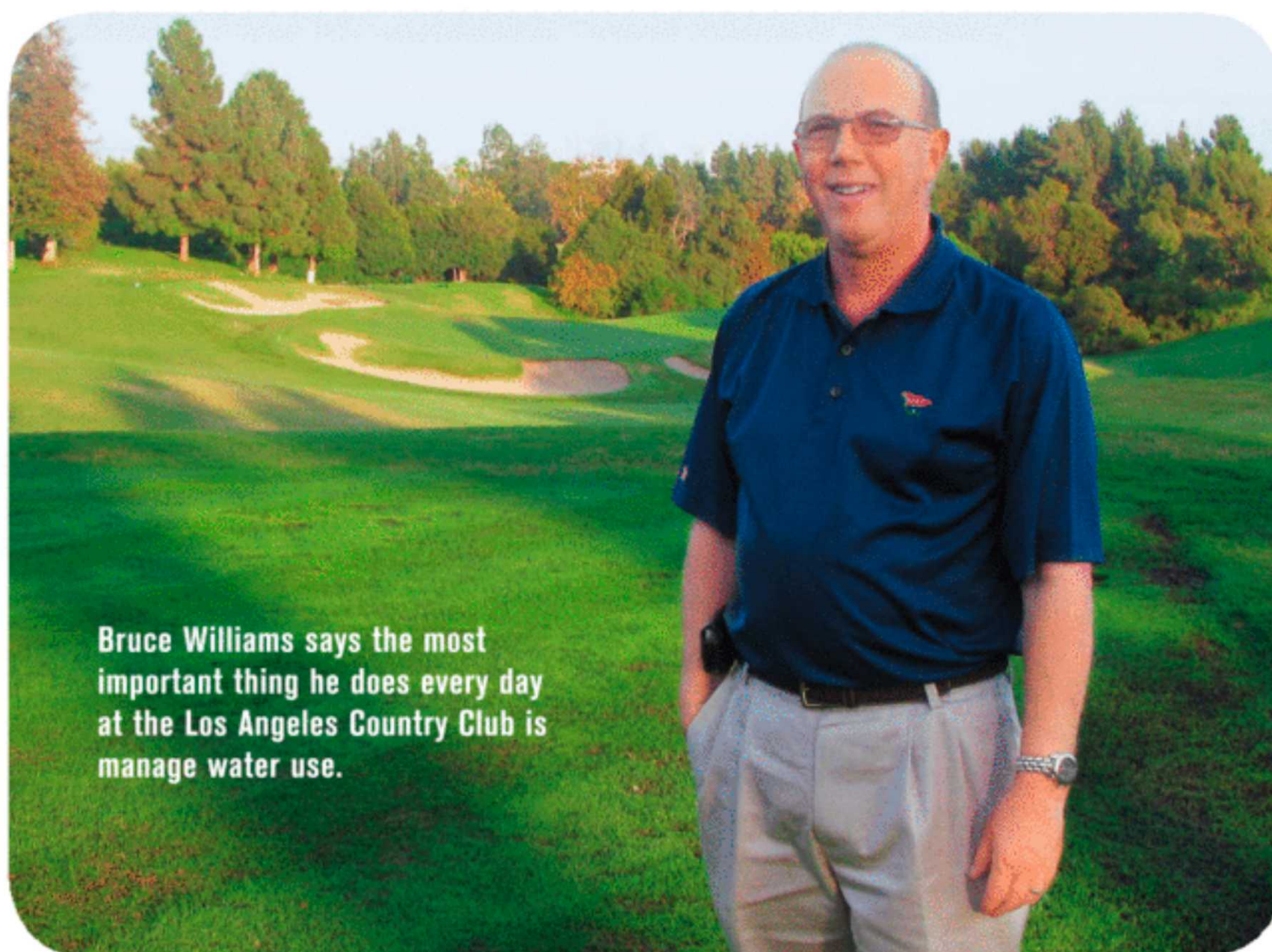
"Everything will be geared toward conservation and doing as much as we can to save as much water as possible," he says.

In 2025, Jarrell and many superintendents agree that freshwater conservation will be spelled E-F-F-L-U-E-N-T.

"I think we'll see nearly 100 percent effluent in Florida by 2025," Jarrell says of golf course irrigation in the state. "While effluent irrigation is a big part of the answer to water reduction, there will have to be more delivery systems."

Williams also expects effluent water use to grow. He says about 33 percent of California courses irrigate with effluent, and he expects that number to rise in coming years if the infrastructure is available for courses to do so.

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Bruce Williams says the most important thing he does every day at the Los Angeles Country Club is manage water use.



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"By the year 2025, I can easily see more than 50 percent of U.S. golf courses being on effluent water," Williams says. "It's very difficult in many states today to get a permit to build a golf course without showing that you're not going to use potable water."

Dan Dinelli, certified superintendent of North Shore Country Club in Northbrook, Ill., agrees that effluent water use will be more common at courses across the country, especially in communities where courses can tap existing sewer lines or are located near water treatment plants. "Effluent water has its maintenance issues," Dinelli says, pointing out it causes salt buildup in soil. "But they're mostly manageable issues."

Dara Park, assistant professor in the department of horticulture at Clemson University, expects golf courses in the South will be required by law to irrigate with effluent in 2025 as long as the in-

frastructure to do so is available. She says superintendents should start preparing now for the future with the help of local university and/or government personnel.

"The most important thing is to get involved," Park says. "Know what's going on in your town and city."

Superintendents also agree that freshwater conservation will be spelled S-E-N-S-O-R-S. Soil sensors are devices that allow superintendents to better understand what's going on below ground and ultimately lead to a reduction in water usage. This relatively new wireless technology could be widespread in 2025, superintendents say.

Shaffer calls wireless sensors the wave of the future.

"Sensors are our CT scans," he says. "They allow us to look into the substrate. We've always had to react to what's on top [of turfgrass] without any knowledge of what's happening underneath. Now sensors will give us the opportunity to peek into that."

Shaffer believes sensors will be mandated for use by 2025. "They will be the only way you can truly manage water," he adds.

The word Dinelli uses to describe sensor technology is "awesome." He is impressed with how sensors can track and grasp temperature moisture and even salinity in soil.

Regarding the latter, sensors could play a huge role in monitoring salt buildup in soil if effluent irrigation does become more widespread, Dinelli points out.

Along with sensors, superintendents are counting on irrigation manufacturers to deliver even better and more refined equipment and products to help save water.

"We have some tremendous companies that are dedicated to managing water on this planet," says Williams, who recalls the days of hooking up to fire hydrants to tap

“The United Nations predicts that two-thirds of the world's population will live in countries that face serious freshwater shortages in 2025.”

water for golf course irrigation. "Today, the engineering that goes into [irrigation technology] really creates the ability for us to apply water effectively and efficiently. I don't anticipate that it will lessen. Competition is keen among the major players."

Dinelli expects more irrigation systems to act as delivery tools for other products, including fertilizer and pesticides.

"Irrigation systems are significant investments, and you can really take advantage of the technologies out there by using them as delivery tools," he says.

Shaffer also expects "great advances" in golf course irrigation, including changes in sprinkler head technology. Shaffer hopes future technology enables him to change the radius of irrigation heads from the controller. "Then you can use the same head for watering perimeters as you do for watering greens, just by changing the radius," he says.

Shaffer also wouldn't be surprised to see irrigation systems that increase heads from 1,500 to 2,500.

"The more heads you have, the more control you have so the less water you use," he says. "But the up-front cost to do that can't be ridiculous."

Park expects more courses will use wetting agents, surfactants and soil



Dan Dinelli is one of several superintendents who is impressed with wireless sensors. Dinelli calls the technology "awesome."

PHOTO LEFT COURTESY: DAN DINELLI; PHOTO RIGHT BY: HOWARD P. NUENBERGER

amendments in the future to conserve water and prevent localized dry spot.

One sure way to get golf courses to use less water today and in the future is to charge more money for it, says North Carolina State Turfgrass Professor Dan Bowman. "Pricing pressures work better than mandates," he adds. "That's what Las Vegas has done to get golf courses and other big water users to reduce their inputs."

In 2025, new golf courses will continue to be designed to use less water and will feature more non-irrigated natural areas. According to the American Society of Golf Course Architects, the incorporation of natural runoff patterns as well as wetlands into the design will help capture and filter potential contaminants, and allow for water to replenish aquifers.

"Experienced golf course architects bring a lot of knowledge to the table about how a golf course can be designed or renovated to use water efficiently and make sure that the water that is used is managed properly," says Bruce Charlton, president and chief design officer of Robert Trent Jones II International, as well as president of the ASGCA. "This goes beyond things like using recycled water and looks at aspects like topographical characteristics, how water flows naturally and grass varieties."

Speaking of grass, the question begs to be answered: Will golf courses be more brown than green in 2025?

Dinelli hopes not. Despite many calls for less irrigated turf to the point of letting it go brown, Dinelli says going brown is not such a good idea, especially in the North. Dinelli understands the idea of letting turfgrass, whether bluegrass or bermudagrass, go dormant with the idea of it coming back. But he says if he lets his bentgrass greens and tees go brown, they could end up dying.

"Personally, I take a lot of pride in



Matt Shaffer, superintendent of Merion Golf Club, expects "great advances" in golf course irrigation technology. Shaffer hopes that future technology enables him to change the radius of irrigation heads from the controller.

growing a healthy plant," Dinelli says. "Now that doesn't mean I over-water or over-fertilize. It's just that a healthy plant offers me sustainable playing conditions."

Dinelli associates brown with turfgrass stress, which means the turfgrass is more prone to disease and weed invasion and doesn't stand up to play very well. In these instances, brown turf is bad, Dinelli says.

"Most of your environmental benefits from turf occur when grass is actively growing," he states. "Turfgrass helps cool the atmosphere. Well, that only happens when it's green and transpiring, not when it's dormant or dead. When the color is brown, the surface gets hot,

so the cooling gets compromised."

Shaffer believes superintendents today and in the future should use less water. He hopes real-time data can help them do so.

A say in the matter

As is today, so shall it be in the future: It's vital that the golf industry has representatives at negotiating tables where freshwater legislation is created. And these tables aren't just set up in Washington; they're in towns across America.

"If you're not sitting at these tables when the rules are made, you're prob-

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ably not going to find yourself in a very good position after the rules and policies are set," Williams says. "We need people in our associations and our industry as well as volunteers to be involved in the decision-making and policy-making."

Those people should come to meetings armed with sound science to prove the golf industry is doing its part to irrigate responsibly, Williams says. They need to point out that golf uses its share of water as part of a viable economic industry. And they need to tout superintendents as irrigation experts who use the most precise equipment in the world to water their golf courses, Williams says.

"The public is often uninformed, and people think golf courses are generally just a water abuser," Williams adds. "But once they're apprised to how [golf courses use water], they realize that we're part of the solution rather than a big part of the problem."

Mark Esoda will attest to that. The certified superintendent for the Atlanta (Ga.) Country Club spearheaded an effort by the Georgia Golf Course Superintendents Association to enact Best Management Practices for irrigation, a move that has benefited the golf industry's image statewide. The Georgia GCSA involved the Georgia Environmental Protection Division (GEPD) in the project, and their relationship has blossomed into one of respect.

Esoda and the Georgia GCSA continue to take their message to the public. Esoda says the Georgia GCSA is telling its story to water councils, environmentalists and the general public. Esoda hopes more chapter associations go on the education and public relations fronts.

"I'm really optimistic that if we walk the talk and stand up for ourselves, we will be well respected in 2025," Esoda says. ■

Lead or Be Left Behind

In the next 15 years, our industry will face enormous pressure to regulate the amount of water used on golf courses. How will you react?

BY CHRISTOPHER S. GRAY SR., CONTRIBUTING EDITOR

I love working at a public golf course. There is no other place on earth you can witness such a diversity of people.

In July, a golfer came to my course, and I can't get him out of my head. The most noticeable feature was his hair, which was a 1980s-style mullet. He was also wearing spandex running shorts with his collared golf shirt. I only wish I had a camera to take a photo of him.

When I saw him practicing on the putting green, I stared at him for a few seconds and then smiled. I thought if he thought his distinctive look made him happy, then so be it. He's not hurting anyone. But the bottom line is the mullet man had found his comfort zone, and he wasn't willing to leave it.

While I can enjoy this type of behavior with fashion statements, I be-

come concerned when it shows up in our industry. I believe that if you think you have hit the perfect place with both your golf course and career and intend to simply continue to do what you have always done, you should retire and find something else to do. You're crazy if you don't think your industry is not changing around you.

This is especially true with water management. If you think you have learned all you can about water management, prepare yourself for a very rude awakening because things will change drastically in the coming years.

Environmentally, the future of golf course irrigation can be summarized with two words: quantity and quality. In the next 15 years, our industry will face enormous governmental pressure fueled by misinformed public opinion and hard-core environmental groups