

Golf Courses Look to Stay Green—but Using Less Water

With many parts of the country trying to cut back on water use, courses are under pressure to reduce their thirsts



In a state where water resources are under strain, TPC Scottsdale, site of the WM Phoenix Open, keeps its grass green entirely with recycled water. PHOTO: ROB SCHUMACHER/USA TODAY SPORTS

By Joe Passov

In mid-February, when the final round of the PGA Tour's WM Phoenix Open beamed into living rooms on Super Bowl Sunday, high-definition television screens lighted up with vibrant green ribbons of golf-course grass.

The optics were striking—and jarring.

After all, a subdivision just outside Scottsdale, Ariz.,—12 miles from Phoenix—recently made headlines because it had run out of water. Meanwhile, Arizona has been fighting a seven-state battle for dwindling Colorado River resources.

So where is the water coming from to create the lush emerald turf that define so many golf courses?

“Golf spends inordinate amounts of resources to generate this conceptually perfect playing surface,” says Taylor L. Weiss, an assistant professor in the environmental and resource management program at Arizona State University, where he teaches classes that cover water and wastewater technologies. “Even in blazing hot summer, many of these golf courses continue to spend those resources for the small number of people who are willing to play.”

“Think of the Scottish origins of the game, when sheep took care of mowing the grass,” says Dr. Weiss, who is a golfer. “What has gotten us to the point where golf needs this perfectly engineered surface, and in places where it puts tremendously more strain on the local environment? Is it worth it? And locals are certainly questioning it because it’s a visual representation of those same decisions being made in all other aspects of water in their lives.”

Golf advocates justify the consumption based partly on their contention that the sport is a key economic driver in Arizona and elsewhere. But they also argue that the sport’s image as a water waster is unfair.

“We’re battling a public perception of how we use water,” says Gary Brawley, a golf-course architect in Peoria, Ariz. “Some people see golf courses as big water users, but what they don’t understand is that we as an industry are fantastic managers. We are leading the way in efficiency.”

Craig Kessler, director of government affairs for the Southern California Golf Association and chairman of the Coachella Valley Golf and Water Task Force, agrees that golf needs to do more in the conservation of water. However, he flatly disagrees with any notion that golf courses are water wasters. “I don’t mind debating someone who says, ‘you need to do better,’” says Mr. Kessler. “But there is no debate here. Golf is an extraordinarily responsible and effective outdoor irrigator.”

Mr. Kessler and others point to an array of tools and practices that the industry is using to successfully reduce water use, and what’s coming in the near future:

Turf removal

In 2003, the Southern Nevada Water Authority introduced a rebate program in Las Vegas that paid golf courses to yank out acres of turf. Within 10 years, its successful approach spread to California and Arizona.

“Turf removal is the biggest guarantee that you’re going to use less water,” says Mr. Kessler. “If you were irrigating 110 acres and now you’ve got 80 acres, you’ll be using less water by definition, whether you’re efficient or not.”

In 2016, Mr. Brawley removed 40 acres of turf from Willow Creek Golf Course in Arizona, replacing it with a base of decomposed granite, which resembles fine gravel, and low-water-use desert plants. “These were in out-of-play areas where golfers seldom ventured,” says Mr. Brawley. “It didn’t affect the playability of the course, and it saved 150 acre-feet of water a year. It may not sound like a lot, but that was enough to satisfy the water needs of 1,300 people every year.”

When Southern California’s El Niguel Country Club in Laguna Niguel, Calif., got rid of 22 acres of grass in 2015, it saved 12 million gallons of water a year—enough to fill 136 Olympic-size swimming pools, says Mike Huck, a former longtime U.S. Golf Association regional agronomist.



The third hole at Longbow Golf Club in Mesa, Ariz., shows native desert landscaping in sand and decomposed granite framing the grass fairways, reducing the area that needs watering. PHOTO: LONNA TUCKER

Grass replacement

Switching from water-craving turf to less-thirsty, drought-tolerant varieties of grass has gained traction in the past two decades. Research has yielded strains of grasses that require up to 30% less water than the state-of-the-art Bermuda grasses of the previous generation. By the end of this summer, two Phoenix-area golf courses—Alta Mesa Country Club and Arizona Biltmore’s 95-year-old [Adobe](#) course—will have switched to the University of Georgia’s TifTuf Bermuda grass to achieve that saving.

Expected in 2024 are two varieties of Bermuda grass that are being tested at the University of California, Riverside. Early tests have attracted attention because the grasses maintain much of their green color during winter, “the holy grail of desert golf,” says Mr. Kessler. Their use would eliminate the costs associated with planting new grass in the fall when Bermuda grass loses its color. (More on that in a moment.)

Irrigation upgrades

Here’s some low-hanging fruit: Brian Whitlark, USGA Green Section agronomist for the West region, said at the 2022 Southern California Golf and Water Summit that courses could save water by raising the level of the sprinkler heads, changing nozzles for more precise spray and replacing the entire irrigation system about every 30 years. The American Society of Golf Course Architects says that by using individually controlled, valve-in-head sprinklers, courses can use each sprinkler only when necessary for a specific area. By comparison, the older systems have several sprinklers operating from a single remote valve. This wastes

water because all the sprinklers in the system have to be operated at the same time for the same amount of time, even if only one small area of turf needs water.

Overseeding alternatives

In the fall, Bermuda grass stops growing and goes dormant for the winter, turning fairways into a dull straw color. To counter that, courses then overseed the Bermuda grass with ryegrass, which provides the deep green that golfers insist on to justify paying top dollar. In the weeks following the overseed, the ryegrass gets drenched with water to encourage growth.

One solution may be the already-mentioned Bermuda grass that doesn't lose its color. In addition, some courses have begun to limit the overseeding to fairways and tees and letting the roughs go brown. Others just overseed tees and around greens.

Another alternative entails [painting the turf](#). Using turf colorants is an old practice—Tucson National Golf Club in Arizona did it 50 years ago to look better on television for the PGA Tour's Tucson Open—but the practice has new adherents thanks to improved quality.

"The savings on the annual water budgets is 15% to 20% for using colorants," Mr. Huck says. "And they've gotten so good matching the colors to make them look like natural turf." He says one golf-course superintendent in California told him that he had a group of regular customers tell him what a great overseed he had last year. "They didn't have any idea that he had painted, not overseeded," Mr. Huck says.



The Dell Ulrich course in Tucson, Ariz., shows the 'partial overseed' approach to reducing water use, where some areas are green after overseeding with ryegrass and other areas of Bermuda grass are left dormant. PHOTO: LORI KAVANAUGH

Recycled water

In recent years, golf courses in the Southwestern deserts have embraced the use of effluent water from municipal sewage-treatment facilities. Approximately 33% of golf courses in California use reclaimed water for irrigation compared with the national average of 12%. The TPC Scottsdale golf course—the one that hosted the WM Phoenix Open in mid-February—is irrigated entirely by reclaimed water.

“Recycled water is an ideal substitute to using potable water or Colorado River water to irrigate golf courses,” Mr. Huck says. “It’s an alternative use of the water, and we’re able to use it twice. We’re not just throwing it away through evaporation. However, even with the best intentions, it will be a challenge to see its use become widespread. New courses and courses within five miles of a treatment plant can certainly benefit. Beyond that distance, the astronomical cost of extending pipes and the disruption to people’s lives from tearing up major streets can be prohibitive.”

Soil-moisture meter

It used to be that golf-course superintendents would measure soil moisture by hand, guessing how much water was needed. Now, a soil-moisture meter does the job a lot more accurately.

“It’s the greatest tool ever invented because it gives the superintendent a very defined level of watering,” says Mr. Huck. “It’s like having a gas gauge in a gas tank. We’re probably saving another 10% to 20% of water with these moisture meters. Now you can skip an irrigation, because the moisture meter said you’ve got enough moisture left in the soil.”

Wetting agents

[Some 92%](#) of golf-course superintendents now use wetting agents that are designed to promote the spread of water through the soil more easily. It allows more water to be held by the soil without overly wetting the soil, so that the precise amount of moisture necessary is achieved.

The wet winter of 2023 has quieted some alarm bells in the short term. However, golf-course managers say they know they haven’t done enough on conservation.

“All of the steps we’ve taken have led to substantial reductions in the water footprint,” says Mr. Kessler. “If we continue making those investments and continuing that commitment, we can accomplish more in the next 20 years than we have in the past 20 years in terms of reducing the water footprint of the golf industry.”

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