SCOTLAND'S MACHRIHANISH DUNES FEATURES A STATE-OF-THE-ART IRRIGATION SYSTEM, EVEN THOUGH IT RARELY GETS TURNED ON

At the Very Minimum

BY ANTHONY PIOPPI, CONTRIBUTING EDITOR

AS IRRIGATION SYSTEMS have become more precise and more water efficient, the number of heads per golf course has increased dramatically over the last 15 years to the point where 2,000 separate water-dispersing units on a new layout is not a rarity.

Machrihanish Dunes, located on the extreme southwest coast of Scotland, opened in July with a state-of-the-art irrigation system. Asked how many irrigation heads are nestled into the Scottish soil, and Course Manager Keith Martin has to think for a minute, doing the math in his head.

"I don't know, maybe 200," he says.

No, Martin doesn't have a problem with simple addition; his calculations are correct. Machrihanish Dunes is built on a Site of Special Scientific Interest, the most environmentally sensitive designation of the Scottish National Heritage. As a result, ecologists of the SNH routed the David McLay Kidd-Paul Kimber layout so that tees, fairways and greens avoided rare plants, animals or dunes land found on the site that borders the legendary Machrihanish Golf Club. Irrigation, other than what falls from the sky, is limited to tees, greens and a small portion of the approaches. Not a drop touches fairways or rough. Pesticides can't be used anywhere on the golf course.

Keith Martin

These extremely detailed and strongly enforced parameters also made installing the irrigation system difficult. For instance, instead of going from one point to another on a straight and logical line, Callum Oliphant and his company Applied Irrigation had to avoid sensitive or protected sites, such as the nesting ground of a rare skylark that inhabits that part of the Kintyre Peninsula. Any turf removed, such as during the installation of an irrigation box, had to be replanted in an area of the property deemed by ecologist Carol Crawford to have the same grass species, no matter how small.

Crawford was hired by the owners of Machrihanish Dunes to police all the work to ensure no procedure violated SNH rules. The irrigation pipe was installed with a mole plow that left behind a narrow slit in the ground and barely disturbed turf that healed within days.

Machrihanish receives between 30 inches and 35 inches of rain a year, double what the East Coast of Scotland gets. The turf on the fairways, as it has been for hundreds if not thousands of years, is a blend of creeping bentgrass, ryegrass and red fescue. On the dunes, along with the marram grass, is sheep's fescue. The mix varies as the golf course moves from near the ocean up into what was once agricultural land.

The tees are 40 percent chewings fescue, 40 percent slender creeping red fescue and 20 percent browntop bent. The greens are of a similar makeup with the long-term goal being 70 percent fescue and 30 percent bent. The bent currently only makes up about 5 percent.

During an average week, Martin might not even turn on his irrigation system. When it's dry, he puts down about 3 millimeters of water a week and hand-waters dry spots, which are a common occurrence on the large sand-based greens, many of which are replete with wild undulations and bold knobs. He'll also use the irrigation system to water in fertilizer applications. The oldest greens were seeded in the late summer of 2007 and the youngest ones in the fall of 2008.

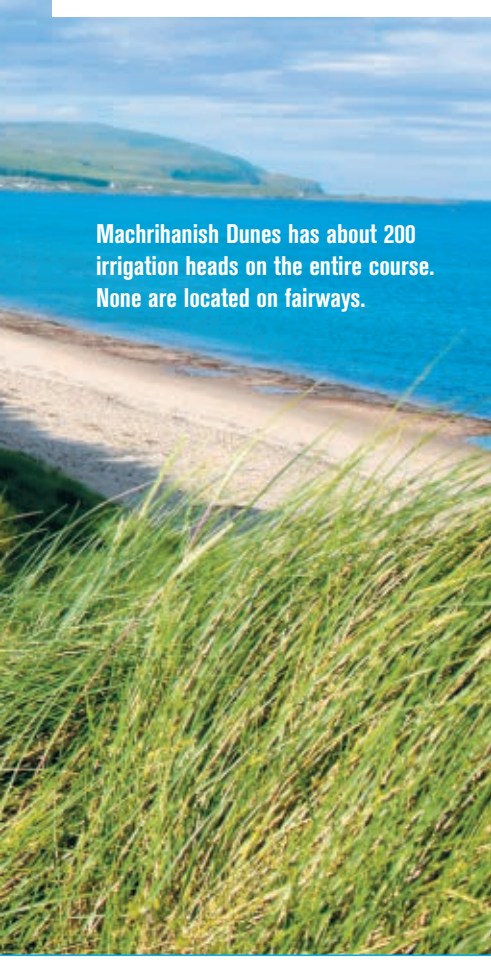
"It's just to keep them alive during dry spells," Martin says of his decision on when to use the irrigation system on the greens. "We use it as a backup if nature doesn't stay on our side."

For seven weeks this past summer, the Kintyre peninsula received little rain, forcing Martin to tap into the course's 40,000-liter holding tank.

"Although [the drought] was hard to get through, it was great because the turf's roots went searching [for water]," Martin says.

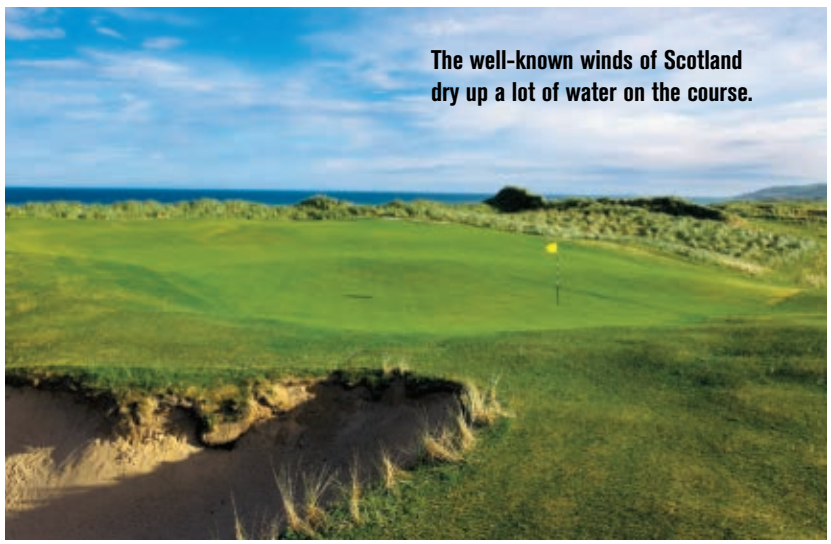
Martin's watering regimen during that time went something like this: "In dry spells, rather than water daily, we'd put down 2 to 3 millimeters in one hit and then just hand-water the rest of the week," he says. "We'd probably water heavily on a Monday, and then let the greens dry out the rest off the week and just hand-water where it's needed. The main thing is we only ever use it when needed."

Continued on page 38



Machrihanish Dunes has about 200 irrigation heads on the entire course. None are located on fairways.

PHOTO COURTESY: SOUTHWORTH DEVELOPMENT



The well-known winds of Scotland dry up a lot of water on the course.

Continued from page 37

Martin, like other superintendents who manage a course that hugs a coastline, has to deal with a normal weather occurrence that hinders uniform watering.

"With the winds in Scotland, the amount of water you lose is ridiculous," he says. "We water at night when it's better to get the water down."

There were interesting demands Oliphant faced while installing the system, as well. "It was quite difficult as where we could go with the mainline, where we could put pipe," Oliphant says. "It made it quite a challenge."

As an example, because of one no-go area near a tee, he had to rout pipe up the backside of a dune so a valve box could be put in, rather than placing it near the tee and out of view.

According to Oliphant, there are four or five irrigation heads for each green with only one having more than that number. There are five to six heads per each teeing complex. Each complex has its own valve so they can be individually regulated.

Not only did Oliphant have to make sure water was getting to the intended areas, he also had to make sure it was not going into protected sections.

"We had to be careful not to water the marram grass and only water the tees," he says.

The same rules apply to the greens. "The main focus is to keep the water on the playing surface," he says, referring to it as an "oasis effect."

Stan Phillips, the area officer for Scottish Natural Heritage, explains the reasoning behind this. "The rest of the vegetation, because of the rare plants that grow there, is subject to natural climatic conditions only," he says.

That means no water and fertilizer.

Martin says the turf is coming along nicely and while the grass may "brown off" at times, it takes a just a little moisture to show it's alive.

"As soon as it gets a drop of moisture, it loves it," he says.

Oliphant returned to Machrihanish Dunes for the grand opening in July, the first time he'd been back since his work was completed.

"We started putting in pipe when there was still cattle in the field," he says. "The transformation is pretty amazing. It's a pretty special site." ■

We Want to Hear From You

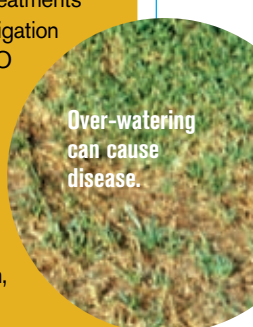
What are you doing on your golf courses to manage water more efficiently? Send an e-mail to *Golfdom's* Larry Aylward at laylward@questex.com. We'll print your responses in an upcoming story.

The GEO Gets to the Point

The Golf Environment Organization (GEO), an international nonprofit organization working to integrate the social, environmental and economic benefits of golf, doesn't beat around the bunkers, so to speak, when it comes to responsible golf course irrigation.

Created out of a partnership project between the European Golf Association, R&A, European Tour and European Commission, the GEO states matter of factly on its Web site (www.golfenvironment.org) that over-watering is a major cause of poor turf management on golf courses.

Efficient irrigation, with the aim to conserve water resources, is also the most economically sensible, the GEO states. "Invasive weeds, disease problems and then reliance on chemical treatments often stem from bad irrigation management," the GEO states. "This can lead to risks of surface or ground water contamination and potentially regulatory infringements. Where water supply is not a problem, drainage often is."



Over-watering can cause disease.

The GEO offers its best management practices for proper golf course irrigation:

- Use a computer-controlled system with valve-in-head design and individual head control.
- Calculate frequency as a factor of soil moisture holding capacity, rooting depth and plant water use.
- Monitor daily use and summarize monthly usage.
- Set targets for yearly improvement in system operation and water usage efficiency.
- Utilize soil moisture sensors to determine when soil conditions are dry enough to require irrigation.

PHOTOS COURTESY: SOUTHWORTH DEVELOPMENT (TOP); SYNGENTA PROFESSIONAL PRODUCTS