Winds blow favorably for weather stations

By Peter Blass

Faced with water shortages and rising water costs, superintendents are increasingly turning to weather stations as integral parts of their water management programs.

The weather station collects and records data on temperature, wind speed and direction, solar radiation, relative humidity and rainfall. It uses that information to determine an evaporative transpiration (ET) rate — the amount of water lost due to plant usage and evaporation from the soil.

Using the ET figure, plus personal knowledge about his own course, a superintendent can more accurately determine how much water to put on his turf daily.

"Just about all new courses are putting them in. They are becoming so important that many government agencies are requiring them before issuing golf course building permits. They want to see something better than just human judgment," said Roger Gordon, president of Gordon's Irrigation Consulting, which has helped install systems at Pebble Beach, Spyglass, Poppy Hills and Spanish Bay on the Monterey (Calif.) Peninsula, PGA West in Palm Springs, Calif., Cherry Hills in Denver, Desert Inn in Las Vegas, Nev., and many other famous courses throughout the world.

Weather stations range in price from approximately $5,000 to $15,000. Most are being installed on new courses, although they can be retrofitted to accommodate existing irrigation systems.

"An extra $5,000 or $10,000 is no big deal when you’re paying $1 million or more for a new irrigation system. It can be a little harder sell to a greens committee at an older course with an existing system," said Ray Davies, superintendent at Virginia Country Club.

"I wish I did," he answered when asked if his course had one.

"The information can be collected directly from the station on a daily basis or, as is increasingly the case, it can be tied into the course’s computerized central irrigation control system. The weather station can automatically determine how much water needs to be replaced. But superintendents generally use the information as a guideline rather than a final number.

"Superintendents are reluctant to turn total control of their watering over to a machine," Gordon said. "They should monitor the system until they make sure it is operating correctly. They should make their daily rounds and look for overly wet and dry areas. Then make their corrections accordingly.

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"The ideal spot is in the middle of a par-4 fairway. But that’s hard to do," Gordon said. "Even if a fairly typical site can be found, the station still measures the ET rate in that single location. And as any superintendent will tell you, there can be many microclimates within a single course.

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"Weather stations are limited in that they are requiring them before issuing golf course building permits," said Gordon. "They help minimize water use, no question," concurred Kenneth Solomon, director of the Center for Irrigation Technology at California State University at Fresno. "Superintendents tend to over-water since too little water can mean their jobs. But over-watering can cause many problems related to disease and fertilizer leaching."

Government agencies and television stations were the only ones that could afford weather stations before the mid-1980s, according to Rod McWhirter, golf manager with Rain Bird. They came into vogue on golf courses in the mid-1980s, about the time computer-controlled irrigation systems started coming on line and water shortages began hitting the headlines, he added.

"Some of the early models worked poorly. I remember one of the first ones we installed," Gordon recalled. "It was in sandy soil and we had to replace 4.4 inches of water the first week. There is no place in the world that needs to replace that much water in a single week. The last three or four years we haven’t seen anything like that." "The newer models are much more reliable and affordable, McWhirter agreed. "With new technology, such as solar-powered batteries and telephone transceivers, allow stations to be placed farther from the central control station. Speed and storage capacity have been increased."

Still, technology has not overcome the need for routine maintenance.

"Failure to maintain them is the biggest problem we see with weather stations," said Jon Williams, golf project manager with Toro. "When someone reports a problem, the first question we ask is, 'When was it maintained last?'"

"We see courses spend thousands of dollars for equipment, but forget to do some simple things. Some of the sensors have to be replaced every six months. Leaves and bird droppings can mess up the sensors. It takes about 15 minutes every three months. That’s a small investment to maintain an expensive piece of equipment."