

# Winds blow favorably for weather stations

By Peter Blais

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 evapotranspiration (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,

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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."

Added Kurt Thompson, Buckner's national sales manager for golf: "We use the premise that these guys (superintendents) are professional turf managers in tune with the needs of their grass. Besides, it's dangerous to use empirical data alone. Our superintendents use the weather station as a reference tool."

Weather stations are limited in that they measure conditions at a single spot. Manufacturers recommend placing them in an area

that is typical of most of the course.

"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.

"Weather stations are very useful, but they are not perfect," said Tim Deutscher, superintendent at Tijeras Creek Golf Club in Rancho Santa Margarita, Calif.

The 18-hole public course installed a weather station when it opened last October. The course's computer divides the course into 17 distinct areas and uses the ET rate and Deutscher's expertise to determine watering rates for each location. New technology will soon expand that to 80 specific areas.

Despite the limitations, weather stations "are definitely worth the investment," Deutscher said. "They can help save a tremendous amount of water."

"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. Technological advances, such as solar-powered batteries and telephone modems, 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."

## GOLF COURSE NEWS

### Exclusive Survey

	Buckner Inc. 4381 N. Brawley Ave. Fresno, Calif. 93722 Dave Truttmann 800-328-4470 Circle #201	Rain Bird Sales, Inc. 145 N. Grand Ave. Glendora, Calif. 91740 Mike Catalano 818-963-9311 Circle # 202	Thompson Mfg. Co. 5075 Edison Ave. Chino, Calif. 91710 Mike Bravo 714-591-4851 Circle #203	Toro Irrigation Div. 5825 Jasmine St. Riverside, Calif. 92504 Jon Williams 714-785-3392 Circle #204
	<b>Buckner 39760 COPS</b>	<b>Rain Bird WS-100, WS-200</b>	<b>Thompson 012</b>	<b>Toro NW8001- AC &amp; SP</b>
<b>Methodology — Temperature</b>	Yes	Yes	Yes	Yes
<b>Humidity</b>	Yes	Yes	Yes	Yes
<b>Wind velocity</b>	Yes	Yes	Yes	Yes
<b>Wind direction</b>	No	Yes	Yes	Yes
<b>Solar radiation</b>	Yes	Yes	Yes	Yes
<b>Rainfall</b>	Yes	Yes	Yes	Yes
<b>Other</b>			<b>Rain intensity</b>	
<b>Does the station store data?</b>	Yes	Yes	Yes	Yes
<b>How long does it store data?</b>	30 days	9 days	Indefinitely	4 days
<b>Does station interface with irrigation control system?</b>	Yes	Yes	Yes	Yes
<b>Will station automatically adjust irrigation?</b>	No	Yes	Yes	Yes
<b>Station's power source</b>	Electric w/battery back-up	Electric, solar, battery	Electric, solar, battery	Electric, solar
<b>How is information relayed?</b>	Wire, radio, phone	Wire, phone	Wire, radio, phone	Wire
<b>Maximum distance from station to controller</b>	Wire-10,000 ft.; radio 2 mi.; phone-unlimited	Wire-20,000 ft.; phone-unlimited	Wire-4,000 ft.	Wire-2 mi.
<b>Can station interface with non-irrigation controls?</b>	Yes	Yes	Yes	Yes
<b>Price range</b>	\$4,000-6,000	N/A	N/A	\$4,500-10,000