

### Using Soil Moisture Meters to Improve Playing Conditions and Conserve Water

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#### The Problem

Ridgewood Country Club is a historic golf course that strives to produce excellent playing conditions. One of the most challenging aspects of managing the putting greens at Ridgewood is accurately determining how much water is needed each day to keep the turf healthy and the surfaces firm.

#### The Solution

In 2011, Ridgewood adopted the use of portable soil moisture meters. Upon using the meters, the staff quickly realized past irrigation programs – replacing as little as 35 percent of daily ET (i.e., evapotranspiration) loss with the automatic irrigation system – were not precise and applied more water than necessary on many greens but not enough water on others.

Ridgewood uses portable soil moisture meters daily to accurately assess soil moisture status to maintain optimal playing conditions and turf health. Nine moisture readings are taken on each green first thing in the morning. Detailed moisture records are kept and compared to turf performance over various weather conditions. Percent volumetric water content ranges were developed to pinpoint how much water needs to be applied to each green depending on weather forecasts. The table below identifies how much irrigation is applied through the automatic irrigation system based on percent volumetric water content values determined by the portable moisture meters.

Percent Volumetric Water Content	Number of Turns for each Automatic Irrigation Head around Greens
≥ 19.5%	0
16.5-19.4%	1
12.5-16.4%	2
< 12.5%	3

*Table 1 - The number of rotations programmed for each automatic irrigation head is determined by the percent volumetric water content readings taken each morning at Ridgewood Country Club.*

On normal summer days at Ridgewood, the target volumetric water content is 19.5 percent. Often, when extreme summer heat – e.g., greater than 95 degrees Fahrenheit – is expected, an extra 2-4 percent volumetric water content is applied. Greens that are more prone to drying out also receive an extra 2-3 percent volumetric water content when necessary.

### The Results

The putting greens have greatly benefited from the regular use of portable soil moisture meters. Overall, the volumetric water content has become much more consistent from green to green – resulting in better playing quality, surface firmness and ball roll. Also, the amount of water applied annually to greens has been reduced. Ridgewood staff estimates that the use of soil moisture meters conserves approximately 1.8 million gallons of water annually. Hand watering isolated dry spots is still performed regularly. However, because soil volumetric water content is more uniform, labor directed toward hand watering isolated dry spots has



***Figure 1 - By consistently measuring soil moisture in all the putting greens, staff at Ridgewood Country Club have been able to reduce water use and improve playing quality.***

been reduced and more labor now can be allocated to other maintenance tasks.

The most noteworthy challenge of using soil moisture meters was determining the volumetric water content percentages that work best for the greens at Ridgewood. There are many course-specific variables involved in determining the volumetric water content percentages that work best at your course including grass species, soil type, growing environment and climate. There is not a one-size-fits-all program.

The use of portable soil moisture meters at Ridgewood Country Club has been extremely successful. Playing conditions have improved, water use has been reduced and water is being applied more accurately than ever before.