

# A Giant Leap Forward

How soil moisture meters are changing the game of putting green irrigation.

BY RANDY GATLIN

**M**oisture management is one of the most important aspects of bringing creeping bentgrass putting greens through a southern summer. Too much moisture encourages maladies such as leaf and root diseases, softness, more susceptibility to mechanical damage, algae, etc. Too little moisture brings on wilt, higher canopy temperatures, and potential for more localized dry spot. At The Shoals (Muscle Shoals, Alabama), we strive for the optimum level of moisture each day to give the bentgrass the best chance to thrive despite soil and air temperatures that are often hostile.

In 2010, we obtained a Field Scout 300 TDR Soil Moisture probe from Spectrum Technologies. Almost immediately we began learning nuances about the putting greens, their performance, and the irrigation system distribution. This article will discuss some discoveries we made using the Field Scout on a daily basis and reveal how we use the Field Scout plus a GPS receiver as a diagnostic tool.

## DAILY USE

**A Clear Language:** The first discovery we made was the ability to speak far more precisely in terms of soil moisture. Clear communication requires that information is sent accurately from the sender to the receiver. Unfortunately, terms like “a little wet” or “really dry” are prone to be misinterpreted between the sender and receiver. When “a little dry” becomes a volumetric water content (VWC) of 11% using the Field Scout, the communication is much more clear.

### Informal Audit of Irrigation

**Coverage:** While the Field Scout can be used to conduct detailed irrigation audits, daily use rapidly uncovers how existing irrigation affects both wet and dry areas. This is powerful information to know when scheduling irrigation run times.



*Golf Course Superintendent Randy Gatlin uses the Field Scout moisture probe on a daily basis to more precisely measure soil moisture on the putting greens at The Robert Trent Jones Trail at The Shoals.*



Expressed in percentage volumetric water content, the Field Scout moisture probe is easy to use and to read the results.



A GPS receiver can be integrated with the Field Scout moisture probe to produce accurate maps of putting greens and spatial variability across a putting green.

**Estimate of Daily Moisture Loss via Evapotranspiration:** Through morning and afternoon monitoring with the Field Scout, we can quickly determine how much moisture was lost during the day. When we take the weather forecast into account, each morning we have a pretty good idea if morning soil moisture is in the optimum range or if we will experience problems with wilt in the afternoon. Additionally, we have become much better at knowing how a given irrigation cycle affects soil moisture.

**Early Detection of Wilt Symptoms:** The Field Scout is a much better detector of turf stress than our eyes. When wilt visibly occurs, the grass is already under significant stress, particularly when temperatures exceed 90 degrees. If we know that, for example, at our site wilt begins to visually appear at 10-12% VWC and we detect a reading of 14% in the morning, more water needs to be added immediately to safely carry the greens throughout the day.

**Management of Extremes / Crisis Management:** With the Field Scout, we instantly know if we are having issues with the greens being too wet after rainfall or too dry from insufficient irrigation. A recent crisis with our pump station drove this point home. The pump station went down one hot day this summer. We quickly assessed how much moisture was in the putting greens and estimated how long they could go without water before serious damage would arise.

**More Confidence:** At the end of the day every superintendent wants to know how effective the watering program for that day or week has been. At The Shoals, the irrigation water applications are now far more objective and less subjective. We leave at the end of the day with much more confidence about the moisture status in the putting greens and what must be done with the irrigation system that night.

### DIAGNOSTIC OPPORTUNITIES

On the Robert Trent Jones Trail, we are very much in the business of golf. The more precise the application of water is in relation to the water needs

of the plant, the less labor-intensive hand watering will need to be done. Using technology to make our operation more efficient and cost effective is always desirable.

We all know that no irrigation system is 100 percent uniform and that uniformity is going to vary from putting green to putting green for a variety of reasons. Conducting a traditional audit is time consuming and has some limitations with a relatively small number of data points. However, we have discovered that we can attach a GPS receiver to our Field Scout and use the data to conduct a much more precise audit of what is actually in the rootzone following irrigation.

At The Shoals, we purchased a subscription to the [SpecMaps Web Based Mapping Utility](#) available from Spectrum Technologies. With this software, we can create a powerful audit of each green and learn more about the coverage. More important, the software allows us to enter sprinkler head locations and the radius of throw for each head. Following the audit, the information is presented in a variety of formats, including a visual picture of the spatial variability of soil moisture in a given putting green.

Although we have not audited all our green sites at this time, we have found the maps to be quite useful. We are in the process of making nozzle adjustments as needed to improve the uniformity of distribution. Anything we can do up front to improve sprinkler coverage is going to save us down the road by way of less hand watering and less turf stress. Most important, we can re-audit a green and confirm how well the adjustments have performed.

## CONCLUSION

The moisture probe has become an indispensable tool in our putting green moisture management program. Game-changing tools like this do not come along every day. Over time, I am sure we will learn new tips and nuances from other superintendents who use these moisture probes. In the meantime, take advantage of this opportunity by taking your putting green water management program to the next level.



*How dry is it? Finally, affordable soil-moisture probes are available to precisely answer the question.*

*RANDY GATLIN, golf course superintendent, has been perfecting the art of putting green irrigation since The Robert Trent Jones Trail at The Shoals opened in 2004.*