University of Guelph update

Water Management Technology: Incorporating New and Old

Maybe it was too many late nights spent studying, but whenever I hear about new technology being promoted I always think of Ron Popiel’s voice, “Set it and forget it!”

Unfortunately the best new technologies get misused and then get dismissed because they are either promoted in this way, or the consumer over estimates the ability of the technology to replace good agronomic knowledge. This is probably most prevalent in irrigation technologies and the purpose of this article is to encourage you to get the most out of new technologies while remembering and conserving the most tried and true methods of water management, your soil probe.

Watering to ET

DEFINITION: Evapotranspiration (ET) is the combined potential water loss from a crop. The ET number that is usually determined comes from a central weather station that measures factors such as sunlight, temperature and wind speed to determine the amount of water loss from a typical stand. Each crop will have an ET crop coefficient, which also factors in the plants ability to conserve water. Watering to ET is typically defining the amount of water that needs to be applied by using the data from the weather station. You apply less water on cool cloudy days and more on hot sunny days.

ADVANTAGES: Typically watering to ET will reduce the amount of water you use if you compare it to watering based on a calendar. If you were watering every three days and you have three cloudy days you should apply less water. Often your central University of Guelph update

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may be...
controller will calculate this and make the adjustment automatically so you do not have to adjust the program manually. It also gives you records of weather conditions that can then be used at a later time to justify increases or decreases in water use, justifying water budgets.

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**MISUSE:** Often when shifting to an ET system managers increase their frequency, and water more often to replace the water that was lost “that day”. This can lead to short roots and increased thatch levels. Another common mistake is that we forget that ET is calculated based on light levels and temperatures from a central weather system. Golf courses have a multitude of microclimates that include high variability in light, temperature and wind, the three factors that affect the calculated ET. In addition, soil type can affect the amount of water available for plant growth.

**SOLUTION:** Use ET as a tool but remember to make sure you calibrate it to your micro-climates and you remember to use your soil probe to make sure you are watering to depth and to your roots. One area of your course may need to be watered weekly at 60% ET while another may need to be watered at 80% every 4 days. These adjustments can also change as sun angles change throughout the year.

**Water To Soil Moisture**

**DEFINITION:** Many devices sold today measure volumetric water content (VWC). This can be done a number of ways but the most common uses a form of Time Domain Reflectometry (TDR).

**ADVANTAGES:** The advantage of these is you can bury them in the soil and get continuous soil moisture readings letting you know the soil moisture without going out to an area. In addition the hand held devices allow you to send out anybody to record numbers and you can make decisions on those numbers at a later time.

**MISUSE:** The most common misuse of these instruments is the assumption that the absolute value that the instrument reads is important. In actuality the type of soil, the salinity of the water in the soil and a number of other factors may play a role in the number that you get from these instruments. Also the probes generally integrate the moisture over the length of the probe so you cannot see where the water is (although vertically mounted probes are becoming more available).

**SOLUTION:** For each soil type or area of the course you need to make sense of that number by calibrating it to your experience and expertise. Turfgrass managers should take their soil probe and their soil moisture meter out together and see how they relate. Once you have calibrated the instrument to your expertise then it becomes a valuable tool. The advantage of this is you also get a good idea of where your roots are in relation to the depth of water in the soil.

New technologies are always entering the market and they usually can help the turfgrass manager conserve water and better manage turf. The key is the manager must continue to make the most out of the technology and never “Set it and forget it”.

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