A holistic approach to irrigation

In the first part of a two-part article, Adrian Mortram from Robin Hume Associates argues the case for a holistic approach to turfgrass irrigation with a nod to greenkeeping methods from the past.

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Setting at the dining table with my father and a group of dear friends, there was also a young man who had won a scholarship from BIGGA to attend BTME by writing an essay on why he wanted to be at the show.

The conversation was eclectic, fast and furious, but almost all was about grass, and for the alternate meaning. Irrigation and the effective and efficient usage of water is a huge subject. Your irrigation system is probably the biggest single investment your golf club will ever make and it must be used to its very best.

This two part article will look at what we, as greenkeepers and course managers, did in the past and how we can use these traditional skills and add new techniques so we are capable of advancing in the future to make the best use of our most precious resource - water.

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Greenkeepers of the past would look for signs of imminent drought by observing footprinting, the depth of dew on the turf caused by the stress of foot traffic, often observed as the sun begins to dip in the sky, or the subtle changes in colour of the bent rich sward indicating water stress or wilting.

Older tools for changing the rootzone increasing the root biomass of the turf.

More recently there has been considerable improvement in the use and efficiency of setting agents and their use extended not only as a benefit for hydrophilic turf but to encompass and encourage the uptake of moisture from dew. Aerating and harvesting run-off from hard standing areas, car parks and roofs? Aeration - both surface and sub-surface - plays a huge part in the effective management and use of water resources. Surface aeration, whether verticutting or scarifying helps remove excess water absorbing organic matter in the surface of the sward and sub-surface aeration, by whatever method, allows oxygen and water to penetrate into the rootzone increasing the root biomass of the turf.

This encourages a deeper rooting sward and a greater soil reservoir capacity. These are all tried and well tested methods to improve the efficiency of water management in the rootzone.

Looking for a yield from their turf, turf managers are not asking for a yield from their turf, only sustainable balanced growth, as the next man when it is still early spring in the UK with little or no growth? Turf managers are not looking for a yield from their turf, only sustainable balanced growth, so water and nutrients should be kept to as low a level as possible.

A knowledge of soil structure and the movement of soil water also has a considerable impact on the efficient use of water. During
this winter most soils/rootzones will have been waterlogged, when all the available air within the soil/rootzone, the pore spaces, is saturated with water.

As water drains away under the influence of gravity, the soil/rootzone reaches field capacity, when the pore spaces are fully charged with air and the capillary pathways fully charged with water.

This may be considered the initial point from which irrigation is calculated, though irrigation should not be calculated to bring the soil/rootzone back to field capacity.

If this was the case, any natural precipitation would ensure the soil/rootzone would become waterlogged and the free natural soil/rootzone would become waterlogged. If this was the case, any natural precipitation would be lost through run-off.

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Let us also look at the factors which cause grasses to lose water, the factors which affect evapotranspiration. They are solar radiation (the amount of light or sunshine), temperature, wind and humidity. Most of these are difficult if not impossible to control, at least economically. However they can be assessed and these assessments can be used to calculate different rates of irrigation for differing situations.

Simply put, a plateau green in an exposed position on a links course will dry out quicker than a sheltered green situated within the dunes. But even this scenario is not simple, as the former will be cooler than the latter when temperature rather than wind may be in control.

A modern weather station may be considered the best.

In the second article, I hope to explore some of the issues raised and discuss the use of modern technology in an attempt to solve some of the problems. Many of the answers are in the use of modern technology, but not all, and an all-round approach as always should be considered the best.
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If this was the case, any natural precipitation would ensure the soil/rootzone would become waterlogged and the free natural precipitation would be lost through drainage, and wasted.

Irrigation must take into account a calculation for the available water capacity. Available water capacity is the difference in the amount of water capacity and allowable depletion. Available water capacity can be used to calculate different rates of irrigation for differing situations.

Simply put, a plateau green on a links course will dry out quicker than a sheltered green situated within the dunes. But even this scenario is not simple, as the former will be cooler than the latter when temperature rather than wind may be in control.

A modern weather station may be considered the best. A modern weather station may assist, but will not give the complete answer. Soil moisture sensing equipment will help to assess sensitive areas.

Referring back to this article’s introduction, I mentioned that we were sat around the dinner table when much of this conversation took place.

There present sat an old friend with considerable experience of installing and maintaining irrigation control systems, his comment was on many return visits to golf clubs the controllers have remained unaltered from their original setting.

We have the technology, so why is it not being used? Is education lacking? Well for the past several years BTME has put on workshops looking at the management of water on the golf course and this year there was a workshop looking at grasses, soil and fertilisers.

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