

# 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

**BTME is arguably the best turf management event existing anywhere in the world. It is a time to seek out the new, look back to the past, meet old friends and start new friendships. In modern parlance it is the perfect place for networking.**

Sitting 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 not 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.

Every drop of water counts, even after the most severe winter in decades for both rainfall and flooding.

Subterranean aquifers should now be replenished but hydrologically it would appear there is a finite amount of water which can fall as precipitation, does this winter deluge mean drought in the near future? If so, should we not in the long term be harnessing this

precipitation when it is available? Should we not be considering water farming in some degree whether it is by trapping excess drainage or harvesting run-off from hard standing areas, car parks and roofs?

Average rainfall figures quoted in the media can be misleading and cloud our judgement. Even though in some areas rainfall has been average for the time of year, in others for instance the north east of Scotland, it has been below average.

Yes, the pattern of rainfall seems to be changing with heavier falls of rain in greater deluges in shorter periods of time. Irrigation data was originally based on agricultural crops when a drought was assessed when the soil moisture deficit reached 30mm, equivalent to a ten day period without rainfall.



Greenkeepers of the past would look for signs of imminent drought by observing footprinting, the delicate depressions in the turf caused by the stress of foot traffic, often observed as the sun began 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 hole cup exposed the root core for inspection giving hidden clues as to the depth of rooting and the water availability in the rootzone; daily switching of the early morning dew could provide up to 1mm of free water, almost one third of the daily requirement.

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.

More recently there has been considerable improvement in the use and efficiency of wetting agents and their use extended not only as a benefit for hydrophobic turf but to encompass and encourage the uptake of moisture from dewy turf. Research and breeding of drought resistance in turf cultivars has gained prominence, as has the

selection of cultivars with better natural colour.

Over feeding and excessive water regimes can lead to a more dominant vivid green colour, but what is colour? Is the colour of the sward to be dominated by the shades of colour on our television screens, or are the natural muted colours of our finer grasses in the UK to be the norm?

Do I see the same shade of green 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 precipitation would be lost through drainage, and wasted.

Irrigation must take into account a calculation for the available water and allowable depletion. Available water is a factor of the depth of root development and the available water capacity.

The available water capacity is the difference in the amount of water in the soil/rootzone at field capacity and the amount contained at permanent wilting point. A knowledge of infiltration rate is also

beneficial as this is a measure of the rate at which a soil/rootzone absorbs water, if the application rate from an irrigation sprinkler system is greater than the infiltration rate of the soil/rootzone, then run-off will occur. Infiltration rate is relatively easy to measure, by using a double ring infiltrometer, and the rate of infiltration can be affected by such variables as compaction and slope (contour).

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

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.

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 new technology, but not all, and an all-round approach as always should be considered the best.

#### about the author



#### About the author

Adrian Mortram is Managing Director of Robin Hume Associates (RHA) who are golf course and sportsturf irrigation consultants based in the UK. Adrian has undertaken numerous education sessions for BIGGA both at regional and national level and his company RHA offer a range of services from irrigation audits through to detailed irrigation design, plans and specifications. For more information please visit: [www.irrigationconsultants.co.uk](http://www.irrigationconsultants.co.uk), or email [adrian.mortram@irrigationconsultants.co.uk](mailto:adrian.mortram@irrigationconsultants.co.uk)





## AMINO-SORB

The Sports Turf Stress Buster



Amino-Sorb contains high levels of specially selected, pure quality Amino Acids and official UK field trials conducted by Groundsmen have proved that, when used as part of a maintenance programme, it will:

- Significantly reduce yellowing of turf when tank-mixed with the leading plant growth regulator
- Greatly increase root mass and the ability to recover from stress caused by water logging or drought
- Boost photosynthesis and increase production of natural enzymes

Amino-Sorb is ideal for use in Low N input fertiliser programmes.

For more information contact Vitax Amenity on 01530 51006, email to [sales@vitax.co.uk](mailto:sales@vitax.co.uk) or visit our website at [www.vitaxamenity.co.uk](http://www.vitaxamenity.co.uk)

\*Amino Sorb is a registered trademark of Bioiberica

