



## Every Drop Counts

By Adrian Mortram

The summer of 2006 has undoubtedly had shades of 30 years ago, 1976, with high temperatures, clear blue cloudless skies and constant gentle breezes. As I have little memory of those halcyon days long gone by my father points out to me that automatic irrigation then was in its infancy, far less of a science. Water bowsers, known locally as gully wagons were hired from the highways department to drench the greens, automatic irrigation consisted of movable rotary sprinklers attached to a skid, which were constantly either moved or turned off by each successive passing four ball. Only the wealthiest and most prestigious clubs had fully automated pop-up systems but although the control systems were state of the art then, they would be rudimentary now. I am reminded of a recent television programme on the Apollo 13 mission, when all the technology available then could now be handled by a simple modern laptop.

Turf was certainly parched save for the relative greenness of the deep rooting dandelions and the clearly delineated lines above the herringbone drainage systems. The interference that the deeper rooting plays a major part in the sustainability of the sward, and resistance to drought. Deep aeration, where appropriate, is a vital tool

to combat drought measures and relieve inevitable compaction, not only to encourage a deeper root system and greater root biomass but also to improve infiltration and encourage more desirable grasses. Back in the 'dark ages' even though water bowsers discharged large quantities of water over the greens, most was wasted, as run-off promptly shed the valuable life giving water to the swales, hollows and invariably provided lush approaches to most greens.

The discussions then were as now, the choice of irrigating 'little and often' or a more 'sustained and heavier application less frequently'. Both methods are successful but for differing situations and neither can be condemned in the right environment. With predominantly soil based greens of a more traditional construction a heavier application may be the norm, and it may be necessary to apply water to six greens only on a rota system irrigating once in three nights. However infiltration rates must be assessed to prevent run off. On sand based greens of a more modern construction lighter rates of application may be required but more frequently to aid infiltration in both cases it may be advantageous to programme the irrigation system to apply a single pass of the sprinkler heads to dampen the surface of the turf before the required application is given, a dampened sward being more receptive to a later more vigorous application.

When discussing application rates and run times with both greenkeepers and turfcare professionals at both STRI courses

and BTME workshops, timing and rate of application is often confused. 'How much water do you apply', 'Oh, 10 minutes per station'. What does that mean in balancing evapo-transpiration rate and application rate? Very little, as sprinkler run times must be matched to application rate in millimetres and this can vary considerably, dependent upon pressure, nozzle size and spacing, among other factors.

Many, if not most irrigation systems are understandably not up to modern standards. Your irrigation system is often out of sight, out of mind until it is required to perform. Rather like suddenly having to run to catch a train and seeing it leave somewhere in the distance as you arrived sweating and breathless, not as fit as you thought you were.

Managing current systems and minimising water usage does not always involve selling the family silver:

- Like Thames Water, leakages within the system can be a problem, a weeping solenoid, a faulty ball valve on a tank, low head drainage at the sprinkler heads can all lose water.
- Sprinkler heads installed several years ago may have sunk, or the surrounding ground risen with continued top dressings over many years, causing the spray jets to be deflected thus creating poor and inefficient coverage.
- Loss of pressure at the pump station can result in poor head to head contact and inefficient application rates.
- Sprinkler arcs may be excessive and by reducing the arc setting and adjusting



the timings, water conservation measures can be achieved.

- The use of wetting agents or even the incorporation of water retaining polymers to aid infiltration and reduce evaporation.

However, although it is possible to wise up on the management of currently installed automated irrigation systems, fundamental changes may be needed in the future. Water will become more expensive and with more regulation will become more restricted. Water is the new political football. On the continent in Denmark for instance, some golf courses are restricted to 5000m<sup>3</sup> per year. On most golf courses this is sufficient only for an 18 hole green and tees system. So what are the future alternatives:

- A well integrated and professionally designed irrigation system with matched performance sprinkler heads can save between 10% - 20% of your current water needs.
- Water farming, collecting and cleaning surface water and run off from roofs, car parks and roadways has to be seriously considered where appropriate.
- Abstraction by 'V' notches on ditches and when in spate streams/rivers, or wells/boreholes, and subsequent winter storage in reservoirs and lagoons has to be considered. Evidence is demonstrating that it is not the quantity of rainfall that is varying but the frequency and intensity; more like monsoon conditions.
- More research and exploration into potential use of alternative sources of water, grey water or treated effluent and even the potential of desalinated water, but perhaps,
- A fundamental rethink of design, management and maintenance strategies with the abolition of water guzzling grasses and use of more environmentally sustainable root zones and grass species.

There was good source of articles in the Drought issue of Greenkeeper International July 2006 outlining further practical measures. As I have said previously, water is a political football so let us not forget that those commentators who are against our frivolous use of water on golf courses and sports pitches will always present statistics to suit their cause. Rainfall figures for example will always be produced from the south east; average figures will



be presented over the past five, 10 or 20 years whichever furthers their cause best. Few commentators ever mention the encroachment of urbanisation on green belt with modern household aids and en suite bathrooms or that two thirds (60%) of potable water is used by industry and only 0.1% used for golf course irrigation. To put golf course irrigation into perspective:

- An acre-inch of farmed water will provide 22,000 gallons [100m<sup>3</sup>] or alternatively 25mm over a hectare 250m<sup>3</sup>.
- Two hundred and fifty [250] modern, four bed roomed houses flushing the toilet 10 times a day will use as much water

in a year as an 18 hole greens and tees system on an average golf course.

Yes, there are problems with water usage and it will probably get worse. Undoubtedly golf course usage will need to be monitored, systems updated and refined, but management systems and knowledge of water movement in the plant and root zone also needs greater understanding.

*Adrian Mortram regularly presents a one-day seminar on irrigation at STRI training courses at Bingley and will be presented a two-day workshop entitled 'Using water wisely – Every Drop Counts' at this year's BTME.*

