Sensors win water savings

A TRIAL conducted earlier this year at Collier Reserve in Western Australia has demonstrated that sensor-controlled irrigation scheduling is feasible and can lead to significant water savings. The trial was conducted by Sports Turf Technology under the watchful eye of Geoff Colgan (parks maintenance supervisor) from the City of South Perth, which manages the site.

Water usage measured with flow meters (converted to mm based on area irrigated)	Jan 10	Feb 10	Mar 10
Net eveporation measured by nearby weather station	110mm	96mm	277mm
Water usage as percentage of evaporation	40%	47%	43%

The equipment used in the trial was the Intelliweb system which is manufactured by MAIT Australia and consisted of four main components:

1: EnviroPro probe installed in the soil root zone – consisted of four sensors at 10-centimetre depths down the profile to 40cm each of which can measure soil moisture, salinity and temperature;

2: Intelliweb Control unit – stores data from the sensors and disables or enables the irrigation controller at the site;

3: modem – relays data between the control unit and a website using the mobile phone network; and

4: website – allows remote viewing of the data collected at the site.

The soil at the site was a deep free-draining sand and the turf type was kikuyu. The Rainman controller at the site was programmed to have a start time (with 40 minutes for each of the stations) for all nights of the week except Friday and Saturday (to avoid possible vandalism of sprinklers). The 40 minutes of irrigation per station delivered a "standard drink" of eight millimetres of irrigation across the site.

This was determined by conducting a catch cup audit of the site. In effect, the maximum irrigation that could be applied to the turf in a week was 40mm (five nights at 8mm per night).

The kikuyu turf in the trial at Collier Reserve, Perth, received a quantity of irrigation that equated to between 40% and 47% of evaporation for the three months of the trial.

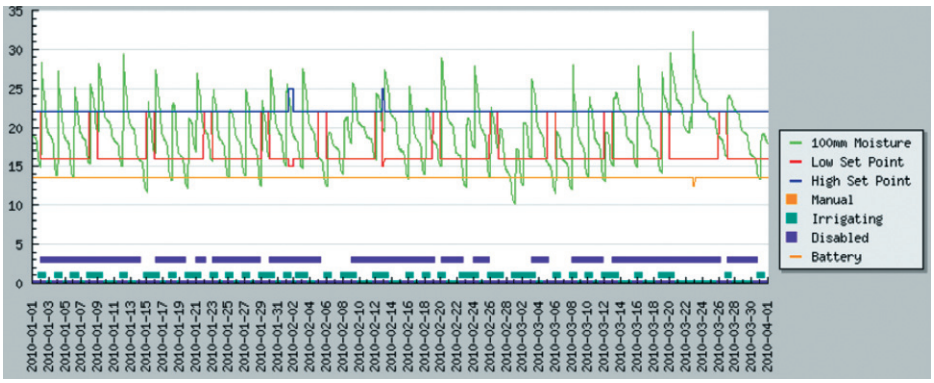
The Intelliweb uses a "high" and a "low" set point to schedule the irrigation events.

Basically, if the soil moisture in the surface 10cm of the turf root zone is above the "high" set point then the irrigation controller is "disabled" and no irrigation will be applied.

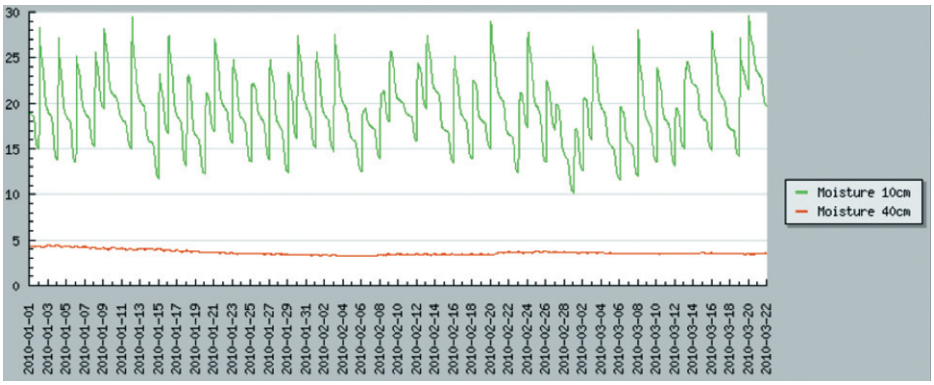
When the soil moisture in the surface 10cm of the turf root zone drops below the "low" set point, the irrigation controller is "enabled" and the next available start time will be allowed to proceed.

When the soil moisture in the surface 10cm of the turf root zone rises above the "high" set point either by an irrigation event or by rainfall, the Intelliweb again disables the irrigation controller.

In effect, the soil moisture in the surface 10cm of the turf root zone oscillates between just above the "high" set point and just below the "low" set point.



In effect, the soil moisture in the top 10cm of the turf root zone oscillates between just above the "high" set point and just below the "low" set point.



The sensor-controlled irrigation scheduling resulted in minimal amounts of water getting down the sand profile to 40cm (no leaching losses).

Findings

The kikuyu turf in the trial received a quantity of irrigation that equated to between 40% and 47% of evaporation for the three months of the trial.

This amount of irrigation was significantly less than predicted based on the research data from the University of Western Australia, where kikuyu turf was found to typically use 56%-81% of evaporation (depending on turf growth rate and climatic conditions).

The sensor-controlled irrigation scheduling resulted in minimal amounts of water getting down the sand profile to 40cm (no leaching losses). This is probably one of the main reason for the water savings. ●