AQUATROLS

Trial Report

Optimizing Water Usage in a Clay Loam Soil via Surfactant Application

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Objective:
The objectives of the trial were to develop a protocol to optimize irrigation scheduling based on evapotranspiration (ET) demand and study the potential of water conservation by injecting surfactants into the irrigation line.

Treatments:

1. Untreated Control
2. InfilTRx at 1753 mL/hectare (24oz/acre) every two weeks
3. ACA 1897 at 877 mL/hectare (12oz/acre) weekly
4. Dispatch at 877 mL/hectare (12oz/acre) weekly

The experiments were conducted at the Center for Turf Irrigation and Landscape Technology (C-TILT), California State Polytechnic University. The plots were laid out in a split-plot design with two factors; irrigation water quality (potable or recycled) was the primary factor and the injection of different surfactants was the secondary factor. Plots were constructed with individual irrigation control. The soil at the site was a clay loam, and Bermuda grass (GN-1) was sodded and maintained at golf course fairway height. Half the plots were irrigated with potable water and half with recycled water.

Irrigation scheduling was based on the evapotranspiration (ET) demand for each month. The plots were irrigated at 100% of the cumulative ET demand for the month of May, 70% of ET demand in the month of June, 30% of ET in the month of July, and finally 10% of ET in August.

Results:

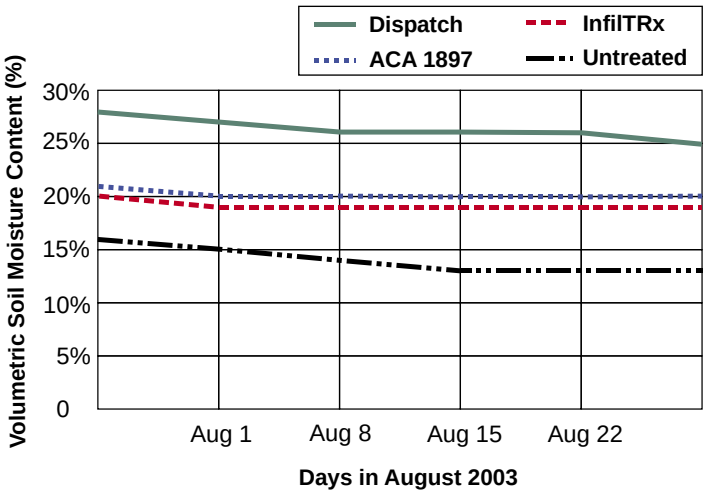

Figure 1 (to right). Changes in volumetric soil moisture content at a 6 inch depth as affected by three different surfactant treatments.

All surfactant treatments helped retain higher levels of soil moisture between irrigation cycles at 6 inches from the soil surface, but Dispatch clearly outperformed all other treatments.

While significant differences in volumetric water content were noted at all levels of ET replacement, treatment effects were more profound under moisture stress. In addition, Dispatch significantly out performed the control, as well as the experimental ACA 1897 and InfilTRx at all ET replacement levels (and thus, from May through August). As the table below denotes, Dispatch increased soil moisture content even when water replacement was cut up to 90%.

The study concluded that when using Dispatch, turf quality of Bermuda grass could be maintained at acceptable quality levels with 70% to 30% of the ET demand when grown on a fine textured soil.

Table 1. Effect of surfactants on volumetric soil moisture content (%) in soils. Data from the 15th of each month was used for the analysis. The means, in each column, followed by the same letter do not significantly differ. (P = 0.05 Duncan's New Multiple Range Test).

Treatments	**Volumetric Soil Moisture Content in Soils (%)**							
	100% ET		**70% ET**		**30% ET**		**10% ET**	
	Potable	Recycled	Potable	Recycled	Potable	Recycled	Potable	Recycled
InfiltTRx	50 b	49 c	30 b	29 c	20 c	27 b	20 b	23 b
Dispatch	**56 a**	**58 a**	**36 a**	**35 a**	**29 a**	**32 a**	**28 a**	**27 a**
ACA 1897	48c	52 b	32 b	32 b	24 b	28 b	21 b	24 b
Untreated	46 c	40 c	28 c	28 c	18 d	22 c	16 c	17 c

What does this mean to a turf manager who is under increasing demand to limit water usage, but still maintain optimal turf quality?

Dispatch maximizes irrigation efficiency and distribution uniformity, even under severely limited water use. It allows water to quickly penetrate through thatch and get into the rootzone where plants can utilize it more effectively. This prevents water lost to run-off and allows for even penetration of applied water through the rootzone. In short, it means you can use *less* water and still provide the same quality turf that you've built your reputation on.

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