

Assessing the Usefulness of Physical Water Conditioning Products to Improve Turfgrass Quality and Reduce Irrigation Water Use

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Objectives:

1. To assess the effect of three water conditioning systems on perennial ryegrass establishment, overall turfgrass performance, and root distribution under potable and saline irrigation.
2. To study the impact of water conditioning units on salinity build-up in the rootzone.

Start Date: 2005

Project Duration: two years

Total Funding: \$6,000

Physical water conditioning units such as AquaPhyd, Carefree, Fre-Flo, Magnawet, and Zeta Core have been used in the golf course industry because of manufacturers' claims that they improve turf quality and reduce compaction, the effect of salts on soil physical and chemical characteristics and on plant growth, and reduce the amount of irrigation water necessary for adequate turfgrass growth and quality. These products are gaining popularity, particularly in the Southwest, despite the lack of scientific evidence to support the manufacturers' claims.

A study conducted at New Mexico State University in spring and summer of 2007 investigated the effect of physical conditioning systems on the establishment, color, and quality, and chemical rootzone composition of a perennial ryegrass stand irrigated with either saline or potable water. The soil at the site is a Torriorthent, a sandy entisol typical of arid regions.

Treatments consisted of 2 levels of irrigation water quality and 5 conditioning products. During establishment, irrigation was applied daily with either potable water (TDS 397 ppm, SAR 1.55, pH 8) or saline water (TDS 3,110 ppm, SAR 8.94, pH 7.5). Conditioning treatments included two catalytic water conditioners (trade names Zetacore and FreFlo), a magnetic water conditioner (trade name Magnawet), a hydro-electrical conditioner (trade name Aqua-PhyD), and a control treatment. The area was established with 'IG2' perennial ryegrass.

Data collection included turfgrass establishment (measured by digital image analysis), visual assessment of turfgrass quality and color, and salinity build-up in



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The water conditioning units had no effect on the establishment of perennial ryegrass and only saline water delayed establishment significantly. When turf quality data were averaged for water qualities, plots irrigated with Aqua-PhyD and Freflo rated significantly better than plots irrigated with untreated or magnetically treated water at the end of the establishment period (July 20).

There was an obvious and expected difference in soil salinity between plots irrigated with potable water and those irrigated with saline water. All the treatments that received saline water showed higher levels of salts compared to treatments receiving potable water. However, water conditioning had no significant effect on the chemical composition of the rootzone.

Research will be continued through 2008 to evaluate the longer-term impact of these conditioning units on quality and rootzone salinity. It remains to be determined if water conditioning improves

rootzone chemistry when salinity levels are high enough to reduce turfgrass quality.

Summary Points

- Studies are underway at New Mexico State University to assess physical water conditioning products under potable and saline irrigation.
- Products tested had no effect on the establishment of a perennial ryegrass stand.
- At the end of the establishment period, Freflo- and Aqua-PhyD-treated plots rated higher in quality and color than control plots. Zetacore-treated plots rated higher in color than control plots.
- Physical water conditioning had no effect on the chemical composition of either saline- or potable-irrigated rootzones.
- Further research is needed to evaluate the long-term impact of these conditioning units on quality and rootzone salinity.