

# What's In YOUR Water?

*Author's Note: This is the first in a series of articles discussing water quality.*

*After a couple of years of digging into the technology of water treatment and its effects on turf, I have to say that the chemistry of irrigation water is one of the least understood aspects of the overall challenge of maintaining a high-quality turf. Unlike the industrial and municipal markets where I lived for 25 years, the turf industry has been slow to develop meaningful tools for the turf manager to use in dealing with the issues related to poor water quality. Collectively, we have seen a number of indices and recommendations for control limits that do not make much sense to the average guy trying to grow grass. Most of the information comes from people trying to sell something and is often viewed skeptically.*

Within the industry, much of the emphasis is placed on fertility and disease-control programs, new configurations of “iron,” and relatively little attention is paid to water-quality issues. This is unfortunate because the need to understand water chemistry grows in importance as we face a host of various environmental concerns and economic considerations connected to poor water quality.

If we irrigate at a rate of 1,000,000 gallons per season, we are putting out over 8 million pounds of water! We put out 350 times more pounds of water than we do nitrogen! We ought to know what's in that water!

The fact is that the **chemistry** of the water DOES impact on the physical properties of our turf. Another fact is that we cannot select a single set of guidelines for “acceptable” water quality and apply them to every golf course in the country! An understanding of how the given components making up the water analysis react with each other is essential in determining how the water may or may not affect the quality of the turf. In addition, soil analysis and specific course conditions must be worked into the assessment in order for it to be truly valid.


The interrelationships between pH, alkalinity, calcium, magnesium and sodium are complex. The values of each relative to the total dissolved solids (TDS) present must be considered in selecting control limits for a given water quality. Guidelines should be considered guidelines, not values that are carved in stone for every water quality. There are several indices developed over the years that help determine the potential negative impact poor water quality may have on turf. A few notables are:

- SAR—Sodium Adsorption Ratio
- adj.SAR—Adjusted Sodium Adsorption Ratio
- pHc—Calculated pH
- RSC—Residual Sodium Carbonate
- Ca:Mg—Calcium:Magnesium Ratio

These are formulations that can be confusing and often misleading. Nevertheless, they attempt to take the critical factors into consideration while determining the worthiness of a given irrigation water. This confusion is complicated by the water analysis reports that are often presented with mixed terms such as ECw and TDS and some values in ppm while others are in meq/l.

It's not simple, but judging the quality of water has in some cases been oversimplified. A complete understanding of all the potential interactions will lead to a proper assessment.

The point is this: You put more water on your turf than anything else! Know your numbers and what the impact of those numbers may be.

Next time, we'll go over a few of the guidelines and the interrelationships they attempt to quantify. 

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