Exploring Turfgrass Salt Tolerance

Continued pressure on water resources in the northeast as a result of population growth and development demands creative approaches to potable water use. In the desert southwest, almost 40% of all golf courses use reclaimed or recycled water. Several communities in Florida have begun constructing reverse osmosis (RO) plants to harvest sea water, in fact some golf courses have their own RO plants. If the turfgrass industry is going to embrace recycled, reclaimed or salty water (as it should) there needs to be improvements in turfgrass salt tolerance.

Researchers at Colorado State University have been investigating salt tolerance in turfgrasses from many different angles. For example, for several years they have searched for alternative turfgrasses, such as Inland Saltgrass, and development is underway. Most recently the researchers have begun investigating salt tolerance in bluegrasses, mainly Kentucky (KBG) and Texas (TBG) bluegrasses.

The results demonstrated a broad range of salt tolerance among the species and hybrids that would allow for successful breeding. Interestingly, it was concluded through a variety of tests and statistical analysis that the aggressive, compact types of KBG, such as Limousine, were more salt tolerant than a common type, such as Kenblue. However, even the most salt tolerant BG type was significantly less salt tolerant than most tall fescue species.

A significant research factor was identified that could further enhance the search for increased salt tolerance. The researchers identified a significant influence of temperature on expressed salt tolerance that future experiments could more thoroughly address.

It is unlikely the bluegrasses will replace other more salt tolerant turfgrasses in their present form. Yet, for areas that demand high turf quality with only modest salt water problems, this research suggests it is possible with the aggressive, compact KBG-types.

From: Suplick-Ploense, M.R., Y.L. Qian, and J.C. Reid. 2002. Relative salt tolerance of Kentucky bluegrass, Texas bluegrass and their hybrids. Crop Sci. 42:2025-2030.

Turfgrass Can Reduce Phosphorus Loading

National concern for water quality resulted in the Clean Water Act of 1973. Over the last three decades that concern has resulted in significant regulation and a persistent search for sources of pollution. The result has been significantly higher water quality.

Agriculture has been a focus of specific groundwater issues relative to pesticide and nutrient leaching. However, recent focus has been on the nutrient loading of surface water from land application of manure, most notably from concentrated animal feeding operations (CAFO's) typical of large scale operations. Simply, there is not enough land to absorb the nitrogen (N) and phosphorus (P) from applied manure.

Researchers at Texas A&M University, in cooperation with turfgrass research Professor Richard White, investigated how sod production following land application of manure can export N and P from the watershed and serve to reduce overall nutrient loading. While the research was conducted on Bermudagrass, buffalograss and Texas bluegrass, some important conclusions can be drawn.

When compared to harvesting hay from fields treated with manure, removing the sod layer that includes the soil removes almost tenfold more P and N. Interestingly, there was no difference in the amount of N or P removal when additional inorganic N was added. Therefore, it was suggested that additional inorganic N that allowed for more rapid crop production would thereby increase N and P removal from the farm and subsequent watershed.

At a time when animal-based agricultural operations are increasing in scale, manure management has emerged as an important environmental concern. Encouraging sod production at these facilities can capitalize on the benefits of turfgrass. Additionally, sod is a high value crop that when installed to bare soil further increases the filtering capacity of the land. The filtering capacity of turf will preserve and protect water quality in environments with high percentages of impervious (paved) surfaces.

From: Vietor, D.M., E.N. Griffith, R.H. White, T.L. Provin, J.P. Muir, and J.C. Reid. 2002. Export of manure phosphorus and nitrogen in turfgrass sod. J. of Environ. Qual. 31:1731-1738.

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Scanning the Journals

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