

Quantification of Denitrifying Genes and Leachate Quality of Turfgrass Irrigated with Tailored Membrane Effluent

Rachelle Herrin, James Cochran, Junko Munakata-Marr
 Colorado School of Mines, Golden, CO

Research Goals

This project investigates the viability of using tailored reclaimed wastewater to irrigate turfgrass. The ultimate goal is to minimize nutrient leaching, preserve soil quality and microbial communities, and maintain or improve turfgrass growth and appearance by use of tailored water versus potable water and surface-applied fertilizer.

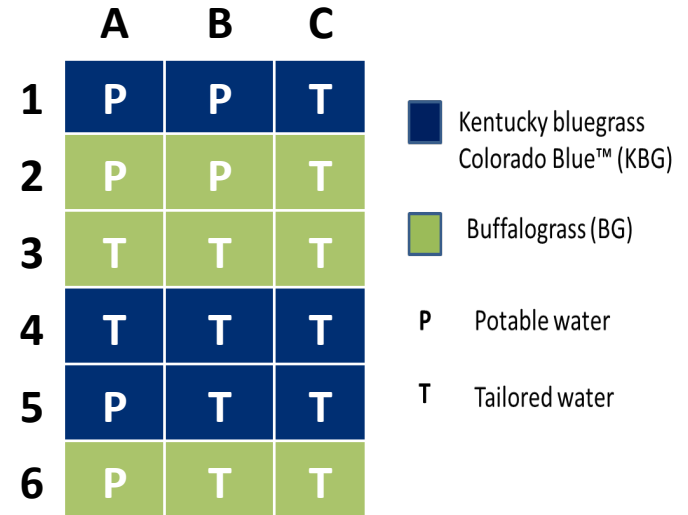


Figure 1. Diagram of turfgrass plot

Results

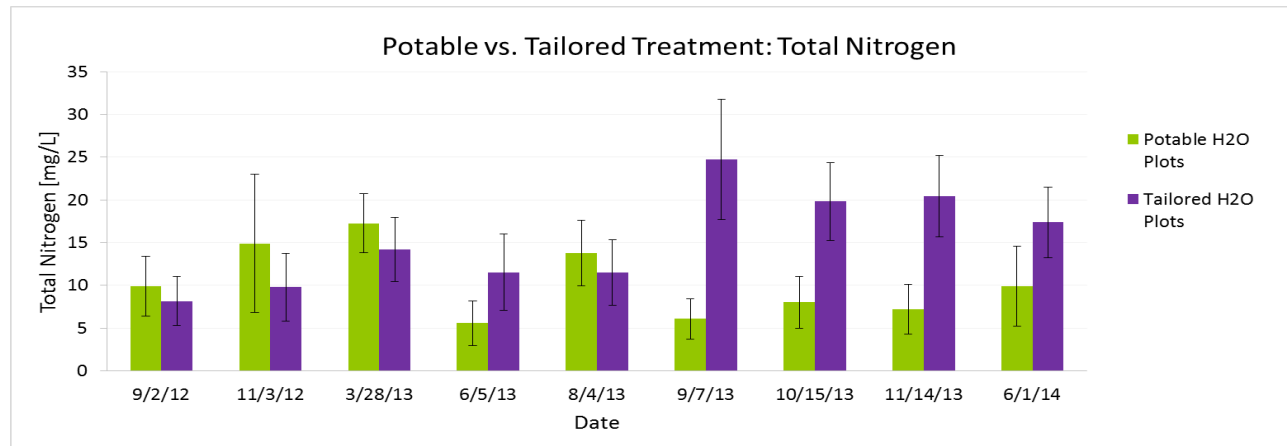


Figure 2. Total nitrogen in leachate of turfgrass for each treatment averaged over grass types

Quantification of Denitrifying Genes and Leachate Quality of Turfgrass Irrigated with Tailored Membrane Effluent

Rachelle Herrin, James Cochran, Junko Munakata-Marr
Colorado School of Mines, Golden, CO

Results (cont.)

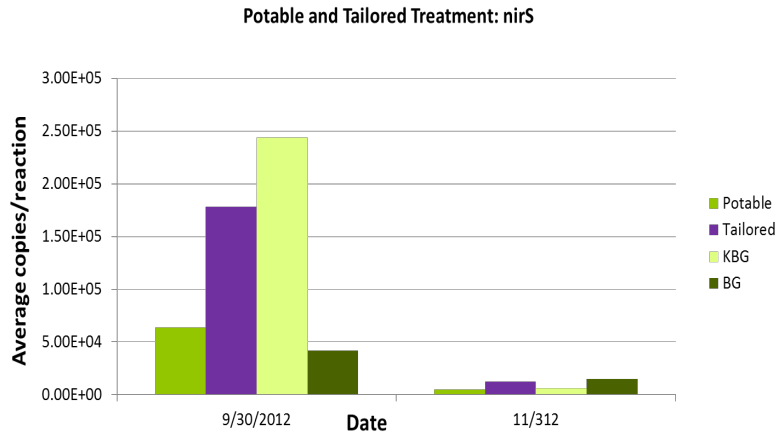


Figure 3. Denitrifying gene nirS concentration in soil samples between treatments and between grass types. Values averaged over 10, 20, and 60 cm depth samples

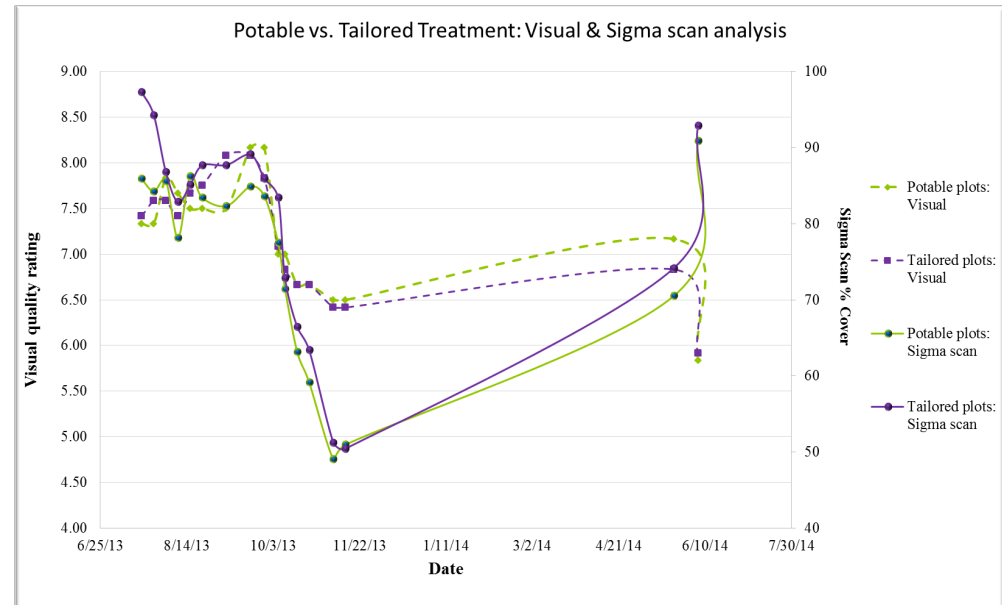


Figure 4. Visual and Sigma scan analysis of turfgrass between two treatments. Averaged over grass types.

Conclusions

- Irrigation of turfgrass by tailored reclaimed water is viable alternative of irrigation
- Total nitrogen present in leachate higher in tailored plots during winter of 2013
- No significant difference in visual analysis of turfgrass between treatment plots
- More data needs to be collected to evaluate denitrifying gene trends in soil samples