Science Societies

Modeling nitrate leaching while establishing turfgrass with reclaimed water

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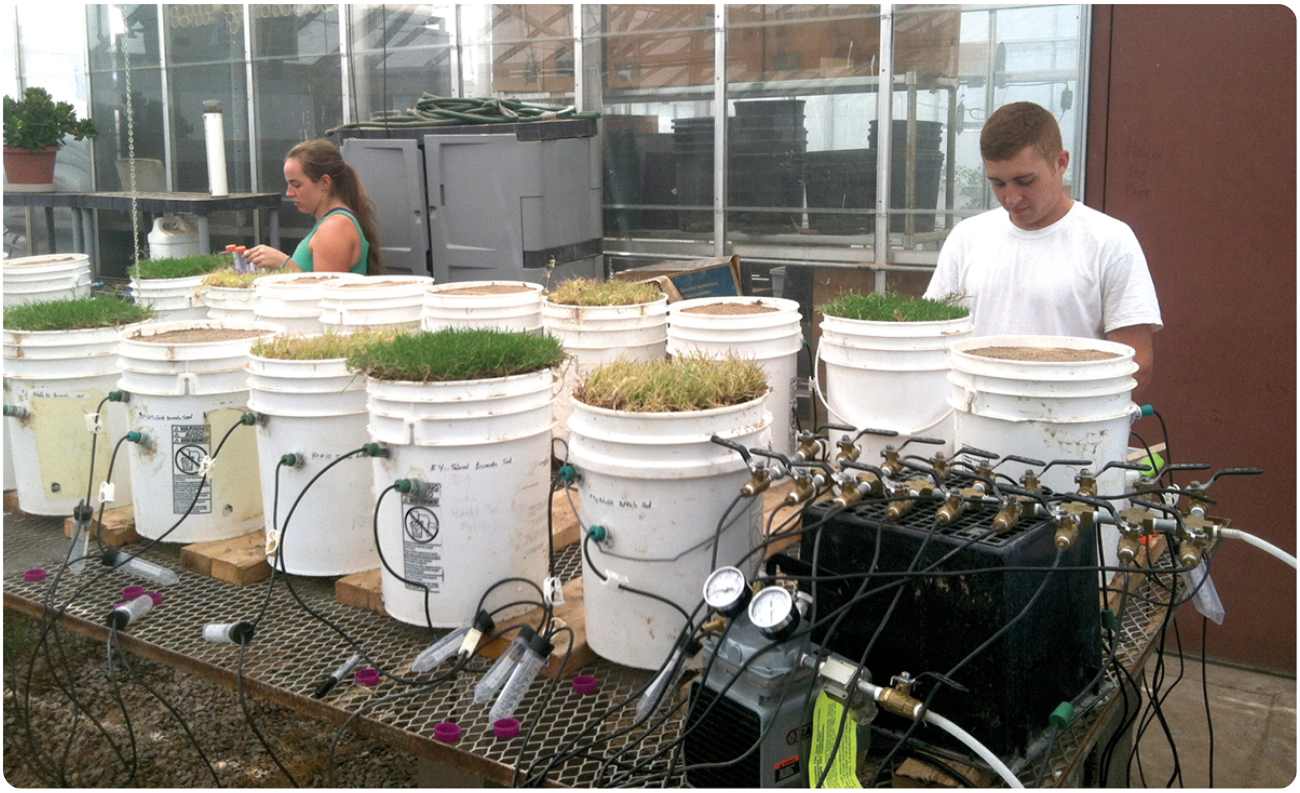

Undergraduate students Shavonne Stanek (left) and Shawn Lopez (right) collecting leachate from containers. Photo by Elena Sevostianova.

Treated effluent water is an important source of turfgrass irrigation water and could be a source of nitrogen if levels were higher than currently permitted. However, more information is needed about nitrate leaching losses during establishment of warm-season turfgrasses irrigated with tailored effluent water (reclaimed water with an N concentration of 15 mg L^{-1}).

The authors of a new *Vadose Zone Journal* article used the HYDRUS (2D/3D) model to quantify nitrate leaching from bermudagrass and buffalograss established by either seed or sod on different soil types, irrigated with tailored effluent water. They found that soil texture, denitrification rate, and plant uptake all affected nitrate leaching. Simulated nitrate flux matched the experimental data more accurately when denitrification rate varied by soil depth. Leaching was higher at the beginning of the establishment period for seed-propagated turfgrass compared with sod. Leaching also increased as the concentration of water increased from 0 to 200 mg L^{-1} and was significantly higher for buffalograss. Nitrate concentrations were significantly higher in coarse sand compared with loamy sand, and soil texture was even more important than nitrate application rate for predicting nitrate leaching losses. Denitrification affected nitrate leaching more than plant uptake.

These results, taken together, provide much more information about establishing turfgrass with tailored effluent water.

Dig Deeper

Geza, M., Deb, S.K., Leinauer, B., Stanek, S., Sevostianova, E., & Serena, M. (2021). Modeling NO_3–N leaching during establishment of turfgrasses irrigated with

tailored reclaimed water. *Vadose Zone Journal*. https://doi.org/10.1002/vzj2.20112

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