

Comparing long-term inorganic-N leaching and water use between a Florida-friendly landscape and a St. Augustinegrass lawn

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Abstract: Low maintenance vegetation may reduce long-term nitrogen (N) leaching compared to routinely-fertilized conventional turfgrass lawns. To explore this hypothesis we constructed a field-scale facility to examine N leaching from contrasting residential landscape models established on a sandy soil. Four replications each of a St. Augustinegrass monoculture (SA) and a Florida-friendly mixed-species (MS) landscape were randomly assigned to 47.5 m² plots. Fertilizer N was applied to the SA landscape bimonthly at a rate of 50 kg ha⁻¹ (total of 900 kg N ha⁻¹), while the MS landscape was fertilized bimonthly at a rate of 40 kg N ha⁻¹ only during establishment (total of 480 kg ha⁻¹). Data were collected for 3 yrs (16 mos to 52 mos after planting). During the first year of the study, water use was about 15% greater on the MS landscape and was about 28% greater during the last two years of the study. Cumulative mean inorganic-N leached was 4.1 kg ha⁻¹ and 7.4 kg ha⁻¹ for the SA and MS landscapes, respectively. Relatively long establishment requirements for the MS landscape led to significantly greater inorganic-N leaching (5.2 kg ha⁻¹) in year 1 of the study compared to the SA landscape (1.3 kg ha⁻¹). After year 1, inorganic-N leaching was comparable on both landscapes, although it was significantly less on the MS landscape in year 3 when no fertilizer was applied. Overall, inorganic-N leaching was low (< 1% of applied N) on both landscapes following establishment, indicating the importance of management practices rather than species composition for reducing N leaching from residential land use.