Nitrogen Mineralization as Affected by Tillage and Year of Stand for Tall Fescue and Fine Fescue in the Willamette Valley, Oregon. (S04-nelson100814-Oral)

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Abstract:

A better understanding of grass seed crop and soil fertility would lead to improving fertilizer practices and preserving water quality in Willamette Valley, Oregon where 55% of land-use is in grass seed production that directly impact adjacent waterways that contain native protected fish species. We determined tillage effects on soil N mineralization processes at two sites contrasting in soil drainage and studied the relationship between temporal changes in soil N, N mineralization, crop N uptake and biomass accumulation, and MBC. Net mineralization was determined using the buried bag method and MBC by fumigation extraction. Net N mineralization and nitrification were tightly coupled at both sites resulting in a nitrate-N dominated soil. Tillage had no effect on fine fescue and tall fescue seed yield during the three years of production. At both sites, throughout the growing season, tillage decreased MBC. Crop N uptake efficiency was lowest during the fall crop re-growth period. Spring mineralization, supplemented with fertilizer N seemed to efficiently meet crop N demand for biomass and seed production. Overall, findings indicate that significant soil nitrate-N loss occur during the high precipitation winter months of late-fall and winter. The fall-winter nitrate flush is exacerbated with tillage is implemented over no till methods.

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