Public Abstract

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Graduation Term:SS 2010

Department:Plant, Insect and Microbial Sciences

Degree:PhD

Title:Remobilization of Leaf Nitrogen in Stockpiled Tall Fescue

Missouri's beef industry is supported by over five million hectares of pasture containing the grass tall fescue (*Lolium arundinaceum*). Stockpiled (accumulated autumn growth used for winter grazing) tall fescue leaf macronutrients decrease in concentration from late autumn through winter. The objective of this study was to elucidate the fate of the macronutrient, nitrogen (N) from stockpiled tall fescue leaves during winter and spring. The stable isotope ^{15}N was foliar applied to plots of tall fescue pasture during autumn in central Missouri. All plant parts were harvested monthly through spring and analyzed for atom% ^{15}N , total N, and N fractions of soluble protein, free amino acids, and nitrate. Recovery of ^{15}N indicated that autumn senescing leaves remobilized over 45-60% of leaf N by spring. Through mid-winter, remobilized leaf N supported areas of active growth, including new tillers, crowns, new rhizomes, and a proliferation of new roots. In crowns and new roots, the free amino acids asparagine (~50%) and glutamine (~20%), were a predominant N storage form in mid-winter. By late April, 70% of new tiller N was remobilized old leaf N. It was concluded that leaf N remobilization supported overwinter growth in stockpiled tall fescue, and this may be a strategy to sequester nutrients to be utilized for spring shoot growth. These findings can be used to develop more efficient N fertilization and grazing strategies in tall fescue stockpiling systems.