

Public Abstract

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Title:Elemental Concentration Changes in Soil and Stockpiled Tall Fescue Leaves after Liming

Tall fescue (*Festuca arundinacea* Schreb.) is the dominant forage in Missouri, and grows primarily on acidic soils that possess little plant available phosphorus. Little is known about the effects of lime on the elemental composition of stockpiled tall fescue.

Sites were chosen at the University of Missouri's Southwest Center (SWC) and Bradford Research and Extension Center (BREC). Calcitic and dolomitic limestone were applied at 0x, 1/2x, 1x and 2x the recommended soil test rate. Tall fescue leaves and soil samples analyzed for elemental concentrations. Forage was harvested and weighed, and total forage production during the two years was increased by limestone at SWC but not consistently impacted at BREC. Following liming, leaf potassium, nitrogen, manganese, and boron concentrations decreased while leaf calcium and molybdenum concentrations increased. Additionally, leaf magnesium concentrations decreased with calcitic limestone but increased with dolomitic limestone. The 2x treatments of limestone increased leaf sodium concentrations at SWC. Lime had little influence on leaf phosphorus, aluminum, iron, zinc, and copper concentrations.

Soil pHs increased; however, neutralizable acidity, manganese, and potassium decreased with increasing rates of limestone. Calcitic limestone increased soil test calcium and had little effect on magnesium while dolomitic limestone increased soil magnesium and only slightly increased soil calcium. An increasing trend was observed for soil sodium, and soil sulfate increased as a result of liming. Soil Bray I and II phosphorus, zinc, copper, iron, and soil organic matter content showed little effect of limestone while the cation exchange capacity was decreased at SWC.