

Phosphorus Nutrition in Tall Fescue: From Stockpiling to Seed Production

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Abstract

Tall fescue (*Festuca arundinacea*) is the most important forage for beef production in the Midwest. Stockpiling tall fescue allows producers to extend the grazing season and reduce winter-feeding costs. In Missouri, forages are the main source of macronutrients for cow-calf operations and there are times during the stockpiling period when the requirements of grazing livestock are greater than the forage alone can provide. The nature of tall fescue results in low leaf macronutrient concentrations below those required by lactating beef cows during late winter and producers should take this into account when utilizing stockpiled tall fescue, especially when beef cattle are grazing pastures on soils with low plant-available phosphorus (P) levels. Leaf concentrations of P, magnesium (Mg) and calcium (Ca) were higher with P fertilization than those of the untreated controls. The leaf concentrations of phloem mobile macronutrients declined from October to February. The decreases in leaf concentration of mobile elements like P, Mg, nitrogen (N), and potassium (K) may be the result of nutrient remobilization from leaves to roots during late fall and early winter as a strategy to provide support for next spring's growth.

Another practice to reduce production costs is the use of poultry litter as a source of nutrients for tall fescue pastures. However, there is some concern about poultry litter increasing the possibility of grass tetany (K/Ca+Mg equivalent ratio > 2.2) in grazing beef cows. Poultry litter treatments of 2, 4 and 8 tons/acre increased leaf N, K, P, and lowered leaf Ca concentrations of stockpiled tall fescue leaves in the first season. The increase in leaf K concentrations, as well as a parallel decrease in leaf Ca and magnesium (Mg) concentrations in poultry litter treatments during the first season, increased the tetany ratio and therefore, produced an increased potential for grass tetany. While the fertilizer treatments also increased the tetany ratios of stockpiled tall fescue leaves, the effects were not as pronounced as those from poultry litter treatments.

Missouri is one of the leading states in the nation for tall fescue (*Festuca arundinacea*) seed production. Tall fescue seed in Missouri is usually harvested from pastures that are managed for beef production and average yields are typically ~200 lbs/acre. Killing strips of tall fescue in pastures is a method that can be used to revitalize tall fescue pastures without disturbing the soil and causing erosion. In late summer of 2004, 7.5 inch strips were killed with Roundup® leaving 7.5 inches of live tall fescue and P fertilization rates of 0, 25, 50, 100 and 200 lbs of P/acre. Solid control plots were not treated with Roundup®. Strip-kill and 50 lbs P/acre increased seed yields by 250% compared to control plots in the first year. Seed yields from solid plots showed no response to P fertilization during the two year study. While the difference between solid and strip-kill seed yields in the second year was not as dramatic as the first year, the strip-kill treatment maintained yields of 500 lbs/acre. Strip-kill and P fertility are important methods for increasing tall fescue seed production on pastures in Missouri.