FOLIAR POTASSIUM THIOSULFATE AND BORON FERTILIZATION OF DRYLAND ALFALFA

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Summary

Foliar applications of K and S as potassium thiosulfate and B as Solubor did not affect total annual alfalfa yields in 1993 or 1994. Soil applications of K, S, and B at "green-up" produced small increases in total alfalfa production during the 2 years.

Introduction

Production of alfalfa under dryland conditions requires good management of plant nutrients. Besides requiring fertilization with macronutrients such as P and K, alfalfa nutritional needs also include adequate amounts of secondary and micronutrients. Data from previous studies have indicated that, in the claypan soils of southeastern Kansas, alfalfa may be more responsive to yield to P fertilization than to K. However, in those studies, K concentrations in the plant were often low. If soil-applied K is becoming partially unavailable, foliar-applied K may benefit alfalfa production. Sulfur is a secondary nutrient that may be low in the topsoils of the area, and fertilization with S also may improve production and quality. The current availability of potassium thiosulfate (KTS) liquid fertilizer gives the opportunity to apply both K and S as a foliar application. Boron is a micronutrient that is important for alfalfa production and can be marginal in the soils of southeastern Kansas. Application of K and S as KTS and B as Solubor may provide increases in yield of alfalfa.

Procedure

The experiment was conducted on a new alfalfa stand planted in fall of 1992 at the Parsons field. The experiment was a 3 x 2 x 2 factorial arrangement. The three rates of foliar KTS were i) 0 lb K₂O/a and 0 lb S/a, ii) 3.0 lb K₂O/a and 2.1 lb S/a, and iii) 6.0 lb K₂O/a and 4.2 lb S/a. Foliar applications of B were 0 or 0.5 lb B/a. Foliar applications of KTS and B were made at approximately 8 inches of growth prior to the first and second cuttings. Soil applications of K, S, and B were applied at "green-up" to supply 80 lb K₂O/a, 28 lb S/a, and 2 lb B/a. Cuttings were taken from a 3 x 25’ area of each plot.

Results

During 1993 and 1994, foliar applications of KTS or B did not affect yields (data not shown). Soil applications of K, S, and B significantly increased total annual yield by 0.4 tons/a (3.8 tons/a without soil K, S, and B fertilization and 4.2 tons/a with soil K, S, and B application).