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LIMING MATERIALS ON A LOW PH COTTON FIELD

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Abstract

Soil pH is the cornerstone of a good cotton fertility program. Soil test results showed that 26% of the samples sent to the University of Missouri Soil Test Laboratories in 1997 had soil pH values less than 5.4 and needed lime to correct the acidity. Applying lime is an expensive input for cotton producers. In Missouri, farmers can choose from agricultural lime produced at several quarries which mine limestone with different Mg contents. In 2000, a field study was begun to compare dolomitic (red) and calcitic (white) lime materials for correcting soil pH in an acid cotton field . The initial soil pH (salt) in the field was 5.1. Lime rates in treatments with red and white lime were adjusted to make them equivalent based on calcium carbonate equivalents and fineness of the lime material. Although white lime caused a more rapid pH increase than red lime in 2000, neither lime treatments resulted in statistically higher yields than the untreated check. Three-year average lint increase from lime compared to the check was 85 lb lint per acre for white lime and 101 lb lint per acre for red lime. Using 52 cent a pound cotton, the gross return from applying lime averaged $44 to $53 per year. A 12-week laboratory incubation experiment was also conducted comparing pH change in an acid soil treated with lime from four lime quarries (Tipton, Auvasse, Peidmont, and Jonesboro). Soil pH tests showed that after 4 weeks, pH in soil treated with dolomitic lime from Peidmont was significantly lower than pH in soil treatment from the other three quarries. However, at 12 weeks, all the incubated soil samples treated with different lime material were above pH 6.0 and were significantly higher pH than the untreated check. The soil treated with Jonesboro lime had the high pH among the treatments.