

# EVALUATION OF BUFFERED FOLIAR APPLIED BORON AND POTASSIUM FOR NO-TILLAGE COTTON

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## Abstract

Foliar applications of potassium (K) has increased cotton (*Gossypium hirsutum L.*) lint yields when produced under K- limiting growing conditions. Buffering foliar solutions to an acid pH range has been shown to improve yields in some years relative to unbuffered solutions. Research was initiated in 1995 and continued in 1997 on a Collins silt loam at Jackson, TN, evaluating the buffering of foliar K and boron (B) solutions. Experimental design was an RCB with treatments replicated five times. Foliar treatments included 0.1 lb/acre B and 4.4 lb/acre of K<sub>2</sub>O and their combinations applied unbuffered, buffered to pH 6.0, and buffered to pH 4.0. Additional treatments included foliar applications of 0.1 lb B/acre of an experimental acid boron material and a untreated check. The experiment consisted for a total of 12 treatments. D&PL 50 was planted by mid-May in 1995 and 1996 with D&PL 5409 planted by mid-May in 1997. Plots were fertilized with 80-30-30 lb/acre of N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O, respectively, using ammonium nitrate, concentrated superphosphate, and muriate of potash. The foliar K source was KNO<sub>3</sub> in 1995 with K<sub>2</sub>SO<sub>4</sub> the K source in 1996 and 1997. The foliar B source was Solubor. All foliar treatments were applied in approximately in 10 gal/acre of water. 'Buffer Xtra Strength', manufactured by Helena Chemical, was used to buffer the solutions just before application. Solutions were applied within 30 minutes after pressurizing the sprayer tanks. Foliar treatments were applied at bloom with treatments repeated on a seven day interval for a total of four applications. Twenty leaf blades and petioles were collected per plot from the top most fully developed leaf, generally the third or fourth from the top of the plant. These materials were washed, dried and ground for analysis. Leaf materials were assayed for K concentrations.

The ANOVA indicated that treatment effects on yield were consistent over the three years of the test since the treatment-by-year interaction was not significant. No-tillage lint yields were increased approximately 100 lb/acre by foliar treatments when compared with the check. Contrast evaluations indicated that buffering solutions to pH 6.0 did not increased yields relative to unbuffered solutions. This evaluation also showed that buffering to pH 4.0 increased yields relative to buffering to pH 6.0.