# VARIABLE RATE LIME APPLICATION WITH GLOBAL POSITIONING SYSTEM

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## Abstract

A study was initiated in 1996 to determine the economic feasibility of precision application of fertilizer and lime for cotton in Missouri. Three fields were sampled by conventional 20-acre composite sampling and 2.5-acre grid sampling using differential global positioning system corrected by radio signals from the U.S. Coast Guard. Lime was applied in replicated strips by conventional uniform and variable rate systems in two of the fields. In a field located at East Prairie, Missouri, soil $pH_s$ from grid samples varied from 3.9 to 5.2. Lime recommendations varied from 1.2 to 4.8 tons per acre. Phosphorus and potassium levels varied across each field. However, Bray-1 phosphorus and ammonium acetate potassium test results were consistently medium or high (> 100 lb P/acre, and >250 lb K/acre). Therefore, no P or K fertilizer was applied. Since lime was applied in the spring shortly before planting, it probably did not have sufficient time to fully react with the soil to effect cotton growth and yield. Cotton lint yields were not significantly different between conventional and variable rate application systems at the 0.05 probability level. The tests will be continued on the same sites in 1997.