

**C.I. Project no. 166-AL**  
**Fertilization of Cotton on Black Belt Prairie Soils in Alabama**

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Cotton producers on clayey soils of the West Alabama Black Belt Prairie region have often complained of leaf-spot diseases which cause early defoliation of cotton. Some of these problems seemed to have been associated with K deficiencies although the soils often test “high” or “very high” in extractable K. Because no soil fertility research has been conducted with cotton on these soils in several decades, an experiment was begun in 2005 to evaluate N, P, and K rates for cotton on these soils and to provide information for soil test calibration. The experiment contained 6 rates of N, 5 rates of P, and 6 rates of K. The experiment is non-irrigated so weather extremes have had a serious impact on yields (230 lb. lint/acre in 2005 and 360 lb. lint/acre in 2006). Reasonably good yields in 2007 (mean 930 lb. lint/acre) and 2008 (mean 1130 lb. lint/acre) seem to verify that Auburn University’s current standard N recommendation of 90±30 lb. total N per acre is a good standard N recommendation for these soils. However, soil test interpretations suggests that current soil test P ratings may be much too low for these soils, e.g. what is considered “low” (16 mg P/kg using Mississippi/Lancaster extract) may actually be “high” extractable P levels for cotton. Therefore, P is often over recommended for these soils. On the other hand, significant cotton yield responses to added K suggest that the K rating should be “low” when it is currently rated “very high” (180 mg K/kg using the Mississippi/Lancaster extract). This change would increase soil test K recommendations for cotton on these soils.