

**POTASSIUM FERTILIZATION
RESEARCH IN TENNESSEE**

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Abstract

Research was initiated in 1991 and continued through 1999 evaluating potassium (K) fertilization of no-till (NT) cotton (*Gossypium hirsutum* L.) production on a Lexington silt loam and on a Memphis silt loam. Research was also conducted from 1995 through 1997 on a Loring silt loam soil. The Lexington and Memphis soils initially tested high and low in Mehlich I extractable K (EK) while the Loring silt loam tested high in EK. The experimental design was a randomized complete block with treatments replicated five times. Potassium rates of 0, 30, 60, 90, 120, 150, and 180 lb K₂O/acre were surface broadcast before planting using potassium chloride. Nitrogen was applied at 80 lb/acre N as ammonium nitrate and 40 lb P₂O₅/acre was applied as triple superphosphate. The cultivar DPL 50 was planted in 1995 and 1996 with DPL 5409 planted in 1997 through 1999. On the high EK Loring silt loam, yields from broadcasted K rates differed each year. The 1995 yields were increased with K rates up to 150 lb K₂O/acre while the 1996 yields were unaffected by K fertilization and 1997 yields were increased with K rates up to 90 lb K₂O/acre. Three-year average yields were increased by broadcasted K rates up to 90 lb K₂O/acre. In 1995, yields produced on the high EK Lexington silt loam were not affected by K fertilization. In 1996, broadcasting 120 lb K₂O/acre increased yields while 90 K₂O/acre increased yields in 1997 and 1998. In 1999, yields were increased by broadcasting only 30 lb K₂O/acre. Five-year average yields were increased by broadcasting 90 lb K₂O/acre. For the low EK Memphis silt loam, the 1995, 1997, and 1999 NT yields were increased by broadcasted K rates up to 90 lb K₂O/acre while 1996 and 1998 yields were increased by with K rates broadcasting 120 and 150 lb K₂O/acre, respectively. Five year-average yields were increased with broadcast K rates up to 150 lb K₂ O/acre. Based on this research, rates of potassium recommended by the U.T. soil test lab were increased for NT cotton production in Tennessee.