EFFECT OF POTASSIUM RATE, PLACEMENT, AND MAINTENANCE ON COTTON, 9-YEAR STUDY

Gordon R. Tupper, H. C. Pringle, III,
M. Wayne Ebelhar and Fred T. Cooke, Jr.
Mississippi Agricultural and
Forestry Experiment Station
Delta Research and Extension Center
Stoneville, MS

Abstract

Cotton producers need to continue to improve management practices and be more cost efficient with today's lower cotton prices. Earlier studies have shown that potassium was more efficient at increasing lint yield when deep banded compared to surface broadcast applications. Earlier studies showed that after 45° angle subsoiling, it was the deep-banded potassium and not the extra subsoil tillage that increased yields. A 9-year potassium study was initiated (1989) at Stoneville, MS, on a soil testing low in exchangeable K. The study was a factorial arrangement of treatments with two rates of surface broadcast potash (0 and 50 lb K_2O/A) and four rates of potash deep banded under the row (0, 50, 100, and 150 lb K_2O/A) in a continuous band from 6 inches to 15 inches deep. During the first three years of the study, the eight treatments were applied annually. Beginning with the fourth year, the plots were split with half of the plot receiving a maintenance application, one out of three years and the other half receiving a maintenance application, one out of two years over the next six years. During the maintenance period, the alternate year application (963 lb lint/A) increased the average lint yield 11 lb/A more than every third year (952 lb lint/A) applications. However, the highest return, above cost of materials and application, was from a one year in three year maintenance application. This treatment received 50 lb K_2O/A surface broadcast plus 150 lb K_2O/A deep banded annually in the first three years and twice in the six maintenance years. This treatment produced a nine year annual response of 152 lb lint/A which increased returns above cost by $62.38/A/yr and $77.58/A/yr at lint prices of $0.55/lb and $0.65/lb, respectively. The top four treatments (deep band 100 and 150 lb K_2O/A with or without surface broadcast 50 lb K_2O/A) had highest returns above costs when the maintenance potassium treatments were applied only one year in three years rather than one year in two years.

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