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Economic Evaluation of Soil and Foliar Applied Nitrogen Fertilization Programs for Cotton Production

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With increased environmental pressures, cotton producers may need to improve the efficiency of N fertilization. Including foliar applications in a cotton fertility program can improve N efficiency through improved application timing and flexibility. The objective of this study was to compare yields and economic returns from four soil and foliar N fertilization programs. Data for 28 site-years were obtained from experiments conducted in 11 states in 2001 and 2002. The experimental design was a randomized complete block with treatments replicated four to six times. Treatments were 1) the full recommended soil-N rate for the site with no foliar N (Full Soil N), 2) 2/3 Full Soil N with foliar urea (Foliar Urea), 3) 2/3 Full Soil N with foliar CoRoN (Foliar CoRoN), and 4) 2/3 Full Soil N with no foliar N (2/3 Soil N). Foliar applications were triggered by petiole analysis for NO₃-N below a critical level that was determined using a Cardy ion meter. Lint yield was highest for Foliar CoRoN and was significantly different from Foliar Urea and 2/3 Soil N but not Full Soil N. Foliar CoRoN had the highest cost and net revenue, and its net revenue was significantly different from 2/3 Soil N only. Foliar CoRoN maintained its positive economic advantage over other treatments under large (100%) changes in N prices and foliar application costs. Applying soil N at 2/3 the recommended rate followed by foliar N applications uses N more efficiently than applying the full recommended rate to the soil, provides at least as much net revenue, and has the added flexibility of correcting N deficiencies during a critical stage of boll development.