TILLAGE EFFECT ON YIELD AND FIBER PROPERTY VARIABILITY

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Abstract

It appears that a major cause of within-field variability for crop yields in the SE coastal plain is differences among soils for water availability. Since conservation tillage tends to increase soil water, patterns of variability with conservation tillage practices may be different from conventional tillage. This study was conducted to determine how tillage and residue type affect cotton lint yield and quality on different soil types within a field and to determine how these soil management techniques affect distribution of fiber properties within the canopy. Treatments were residue cover (continuous cotton with a rye winter cover crop, cotton rotated with corn, and continuous cotton without winter cover) and tillage (conventional and conservation). The experiment was initiated in 1997. Data from the continuous cotton plots was collected each year while yield data from the plots rotated with corn was collected only in 1998 and 2000. Plot size was six 38-inch wide rows that ranged in length from about 400 to 700 feet, which spanned across three soil types. Each plot was subdivided into 44-ft long sections before harvest, and the soil type from each section was determined from a detailed soil map. There was no difference in yield between conventional and conservation tillage in 1997, but conservation tillage had a significantly higher yield in each of the last three years (yield differences between tillage systems were 211 lb/ac in 1998, 69 lb/ac in 1999, and 91 lb/ac in 2000). Under conservation tillage, the cotton grown after a rye winter cover crop and the cotton rotated with corn had similar yield. Both of these residue treatments resulted in higher yield than continuous cotton without winter cover. However, residue management and tillage had little affect on yield variability as similar responses to these treatments occurred for all soil types. Whole crop fiber property differences were small between tillage treatments and soil types. Also, residue type and tillage had little effect on within-canopy fiber property distribution.

Reprinted from the *Proceedings of the Beltwide Cotton Conference*
Volume 1:600-600 (2001)
National Cotton Council, Memphis TN