

## **COMPARISON OF COTTON GROWTH AND DEVELOPMENT IN NORTH CAROLINA AS INFLUENCED BY TILLAGE SYSTEMS**

**T.A. Spivey**

**J.L. Heitman**

**R. Wells**

**D.L. Jordan**

**G. Wilkerson**

**K.L. Edmisten**

**North Carolina State University**

**Raleigh, NC**

### **Abstract**

In North Carolina, it is recommended that cotton planting occur only after soil temperatures reach 18° C by 10 AM and when warm, dry conditions are predicted for the next five to seven days. These recommendations are based on previous findings that show a reduction in emergence when soil temperatures reach 15.5° C and an increase in seedling disease incidence when germinating cotton is exposed to prolonged, excess moisture. Tillage practices, cover crops, and planting dates are three major factors that can influence soil moisture and temperature conditions at planting. The objective of this study was to evaluate and compare short term (single season) cotton production in reduced-till systems with that grown on conventional raised beds at multiple planting dates, with and without a cover crop. This study was conducted in Lewiston, NC and Rocky Mount, NC from 2014 through 2016. Treatments included six tillage treatments of fall and spring conventional raised beds and flat strip tillage planted in early and late May, with and without a wheat cover crop. Soil temperatures taken at planting in 2015 and 2016 were highest in plots without any spring tillage and in plots with a cover crop in both years and at both locations. Plant samples were also taken to determine early season crop growth rate (CGR). Pre-plant spring strip till had the greatest early season CGR while, plots without spring tillage had the lowest. In 2016, in-row soil resistance was measured from 0 to 30 cm depth using a conical penetrometer both at planting and after harvest. Plots without any spring tillage had the greatest soil resistance for all measurements and depths. All plots with spring tillage had similar soil resistance to at least the 20 cm depth from which point the conventional spring raised beds had the least soil resistance through the 30 cm profile. Late planted cotton in 2014 showed minor, inconsistent yield differences, as influenced by tillage system, with pre-plant spring strip till having the greatest yields at both locations. When pooled across year and location for the remaining site-year environments however, tillage system did not influence cotton yield. Similar to previous research, findings indicate that cotton grown in these reduced-till systems is comparable to cotton grown in conventional systems, especially in years in which early season rainfall is not excessive.