COMPARISON OF TILLAGE PRACTICES IN NORTH CAROLINA COTTON

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Abstract

Cotton seedling emergence is reduced and development is slowed when soil temperatures reach below 15.5°C. Therefore, in North Carolina it is recommended that 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. Tillage practices, cover crops, and planting dates are three major factors that influence soil temperatures at planting. The objective of this study was to evaluate and compare short term (single season) cotton production in minimal tillage systems with that grown on conventional raised beds at multiple planting dates with and without a cover crop and to evaluate and compare long term (multiple seasons) cotton production in continuous minimal tillage systems with that grown in a continuous conventional tillage system. A short term tillage test was conducted in Lewiston, NC and Rocky Mount, NC in 2014 and 2015 with 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. A second study was conducted in 2014 and 2015 in Clayton, NC with six long term tillage systems of fall and spring raised beds, flat strip tillage, and no till. Soil temperatures taken at planting in the short term tillage test were highest in plots without any spring tillage and in plots with a cover crop at both locations. Plant samples were also taken to determine early season growth rate. Spring strip till two weeks prior to planting had the greatest early season growth rate across location and planting date. Yields taken each fall showed that this same treatment was the only treatment to be among the highest yielding at all planting dates and locations. Soil resistance measurements taken before and after the 2015 growing season in the long term tillage test showed the continuous no-till plots had the greatest soil resistance at both measurements and the conventional plots had the least. No-till treatments that were ripped in the initial fall of 2013 had soil resistance similar to the conventional plots after two full growing seasons. Yields in 2014 were highest in plots with some form of raised beds, though no differences were seen in 2015.