POTENTIAL VALUE OF IRRIGATION TO COTTON PRODUCERS IN NORTH CAROLINA AND THE UPPER SOUTHEAST

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Abstract

In 2012, only 2.7% of the North Carolina's cotton acreage was irrigated compared to the national average of 39%, even though prior research has shown irrigation can increase cotton yields or more importantly, stabilize yields in years receiving below average or sporadic rainfall in North Carolina. Prior research conducted in Lewiston, NC show that cotton yields in years receiving 45 cm of rainfall or greater are not affected by irrigation and that cotton yields are increased by irrigation when less than 35 cm of rainfall is received. The objective of this research was to perform a field experiment to investigate the impact of irrigation on developmental rates, growth, and yield of early- and mid-maturing cotton cultivars planted in early and late May and early June. In Lewiston, NC, Phytogen cotton varieties 333WRF and 499WRF were planted at three planting dates throughout May and early June of 2014 and 2015, both in plots with drip irrigation systems and in plots without. In 2014, Lewiston, NC received 67.31 cm of rainfall and there were no differences in all data taken between irrigated and non-irrigated plots. In 2015 however, Lewiston, NC received only 32.72 cm of rainfall. Regressions of weekly plant heights and whole plant and fruiting dry weights taken four times throughout the year versus days after planting showed that irrigation increased plant heights and dry weights throughout the growing season regardless of planting date and variety. Cotton yields showed no difference between treatments in 2014. In 2015 when only 32 cm of rainfall was received, irrigation increased yield compared to non-irrigated plots. The first planting date yielded the highest in irrigated plots and the third planting date had the greatest yields in non-irrigated plots due to late season rainfall events after the first and second planting date had already cutout. The trends observed in this study are similar to research conducted at this site since 2001 in that irrigation does not affect yields in years receiving approximately 45 cm of rainfall or greater and can increase cotton yields in years receiving approximately 35 cm of rainfall or less regardless of planting date and variety.