EFFECTS OF COTTON SEEDING RATE AND ROW SPACING ON YIELD AND FIBER QUALITY

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Abstract

Throughout history, the majority of cotton produced in the Mississippi Delta has been managed on wide rows (30-40 inches). Recent improvements in technology of both planting and harvesting equipment has led to questions regarding optimum row configuration and respective seeding rates for optimum cotton yield and profitability in current management environments. The Arkansas Cotton Incorporated State Support Committee funded a three year project that was initiated in 2007 to evaluate the potential for improved yields and/or fiber quality and to monitor plant fruiting configuration under alternative row configurations and seeding rates. Studies were initiated on a clay loam at the Northeast Research and Extension Center at Keiser, Arkansas and a silt loam at the Lon Mann Cotton Branch Research Station at Marianna, Arkansas. The experimental design was a split-split-plot with row patterns as main plot factors and seeding rates as sub-plot factors. Row configurations evaluated included standard 38 in. row spacing, twin-7.5 in. spacing, and twin-15 in. spacing all of which were planted on standard 38 in. beds. Seeding rates evaluated were 35,000, 45,000, 55,000, 65,000, and 75,000 seeds per acre. The Keiser location was terminated in 2009 due to excessive rainfall that resulted in stand loss, therefore only data from the Marianna location was reported. Plots were four rows wide and 50 feet long with four replications. Fiber quality will not be included in discussion due to the late season rains, which resulted in delayed harvest and processing of lint samples. No interactions between row spacing and seeding rates occurred; therefore only main effects were analyzed and discussed. Significant differences in plant survival were found across seeding rates. Optimal stand was achieved by seeding rates of 45,000-75,000 seed/A. Nodes above white flower were lower on July 29, 2009 in the 15 in. twin row cotton, resulting in earlier maturity. Plant mapping data indicate that a significantly lower number of total bolls/ plant (TB) were found in the 15 in. twin row cotton. The highest TB found among seeding rates were observed at 35,000 seeds/A. As expected, there is an exponential decrease in TB as the seeding rate increases. The percent of bolls found at first position was significantly higher in both twin row settings. The 35,000-45,000 seeds/A rates resulted in reduced bolls produced by first positions. No differences in yield were found across row spacing effects. The highest yields were derived from 45,000 – 55,000 seeds/A. Results from 2009 coupled with results from previous years, indicate that planting pattern and seeding rate will influence cotton maturity, growth, and yield parameters. Twin row planting, especially 7.5 in. has become popular in grain crops. However, in regards to cotton development and yield on silt loam soils it has not demonstrated to be an advantage over current 38 in. single row patterns. In regards to seeding rates, 45,000 - 55,000 seeds/A continue to produce maximum yields.