EVALUATIONS OF COTTON PLANT DENSITY IN ULTRA- NARROW AND CONVENTIONAL ROW SPACINGS

Philip H. Jost and J. Tom Cothren
Texas Agriculture Experiment Station
College Station, TX

Abstract

Cotton (*Gossypium hirsutum* L.) growers are faced with rising production costs and static crop prices. A potential strategy for reducing production costs, by shortening the growing season, entails growing cotton in ultra-narrow rows with elevated plant densities. A three-year field study was conducted near College Station, Texas to document differences in vegetative and reproductive growth of cotton grown in four row spacings of 7.5, 15, 30, and 40 inches. In the 7.5-inch rows, the plant densities established were 40,000, 75,000, and 120,000 plants/A. Densities of 40,000 and 75,000 plants/A were established in the 15-inch rows. In the 30- and 40-inch row spacings, conventional plant densities were evaluated. Plant height was reduced in the 7.5-inch row spacings, regardless of plant density, in only one year. In two of the three years, total node counts were reduced in the 7.5-inch rows with the high plant density. Canopy closure occurred most rapidly in the 7.5- and 15-inch row spacings with the higher plant densities. Despite less leaf area per plant and smaller plants in the higher plant densities, these treatments accumulated leaf area index and produced biomass more rapidly than the conventional row spacings. In 1998, a relatively dry growing season, the higher plant densities in the 7.5- and 15-inch row spacings tended to partition more biomass to reproductive structures and yielded more than the conventional row spacings. The 1997 and 1999, growing seasons were relatively wet and yields were unaffected by the row-spacing treatments. In 1997 and 1998, the 7.5-inch row spacing with the high plant density had 90% of the harvestable bolls at the first fruiting position and 50% of the bolls located on the first 10 nodes. Both of these percentages were greater than those observed in the wider row spacings. These factors are contributory to the earlier crop maturity observed with the 7.5-inch row spacing at the high plant density in 1998. Narrow row spacings and high plant densities did not consistently alter fiber quality.

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