

EVALUATION OF ROW SPACING AND PLANT POPULATIONS IN UNR COTTON

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SUMMARY

Growing cotton in 38 and 40-inch rows with numerous spring tillage operations has been the traditional production practice in the hill section of Mississippi for a century. However, over the past decade minimum tillage practices such as no-till or other conservation-till have become accepted practices for cotton production. At the beginning of the new millennium, producers are interested in planting cotton no-till with a grain drill rather than a row planter and harvesting with a stripper rather than a spindle picker. At the present, data on row spacing and plant population for rows less than 38 inches are not available to producers of this region. This study was conducted to determine the ideal row spacing and plant populations for ultra narrow row (UNR) cotton in the Brown Loam section of Mississippi.

The experiment site was on S. H. Hurdle's farm in Benton County, Mississippi. Soils on the site were Grenada silt loam (fine silty, mixed thermic Glossic fragiudalf) with less than a 2% slope. Average depth to fragipan (a restricted layer to root penetration and downward water movement) was 26 inches. Plots were 20 feet wide and 300 feet long. Plots were planted no-till by making two passes using a 10-foot Great Plains grain drill. Row widths were accomplished by blocking metering tubes within the hopper of the grain drill. Seeding rates for the different row spacing was accomplished by adjusting the opening at the metering gate. Roundup Ready varieties were planted in 1999 and 2000.

Roundup (glyphosphate) was sprayed post emergence for weed control at three weeks after cotton emergence. Tramlines used for tractor traffic ran perpendicular to the plots thereby crossing all the plots at the same location within the plots. Insecticides were sprayed according to scouting reports and consultant's recommendations. Cotton was defoliated when boll openings reached 70 percent. A desiccant was sprayed over all plots 10 days after defoliation. Harvest occurred five days after desiccation.

In row spacing, plant height decreased with the narrower rows. In 7.5-inch rows an increase of 50,000 plants per acre resulted in a decrease of 2 inches in plant height. Plant survival rate decreased with an increase in plant population. In 7.5-inch rows when the population exceeded 70,000 plants per acre, the increase in number of bolls per square foot failed to increase in proportion to the population increase. Barren plants increased with an increase in plant population for each row spacing. In 7.5-inch rows when plant density exceeded three plants per square foot, 30 percent of the plants were barren. Boll size was also greatly affected by row spacing and plant population. Boll size was the largest in the low population with wider rows, and smallest in the high population with narrower rows. Yields were the highest when the plants were more evenly spaced in both directions in the field. The highest yield was with a plant spacing of 1.5 plants per square foot in the 15-inch row spacing.