

**RESPONSE OF COTTON GROWTH
AND DEVELOPMENT TO ROW SPACINGS
AND PLANTING PATTERNS**

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Abstract

The production of cotton in row spacings and planting patterns other than the conventional solid planted wide spacing (38 or 40-in rows) has accelerated greatly in the Mississippi Delta during the past several years. Narrow-row cotton production (production in rows spaced 35-in apart or less) is attractive to many Mississippi growers because it allows a complimentary row spacing with rotational crops to be used, has the potential for increased profits, and is now more accessible due to the increased availability of narrow-row spindle harvesters. Previous studies have shown that row spacing affects both the physiological and agronomic development of plants, and this may lead to yield advantages for narrow-row cotton compared to more conventional row spacings. Another variation in planting geometry currently practiced throughout the cotton-belt is skip-row cotton. Skip-row involves the planting of cotton in an alternating pattern with a certain number of unplanted rows in a field. Currently, there are many variations of skip-row cotton being used in the Mississippi Delta, but one popular pattern is the 2x1 full skip-row pattern. This system involves the planting of cotton in a 2x1 pattern, where 2 rows of cotton are planted and 1 row is left unplanted. Currently, detailed information concerning the effects of row spacings and planting patterns on cotton growth, fruiting patterns, earliness, and lint quantity/quality associations is lacking. The objectives of this study were to evaluate the effectiveness of various planting patterns (solid vs 2x1 full skip) and row spacings (40-in vs 30-in) for cotton production in the Mississippi Delta; to determine the effects of row spacings and planting patterns on cotton growth, fruiting patterns, and lint development; and to assess the relationship between earliness and planting geometry (row spacings and planting patterns).

A 2-year (1995 and 1996) field study evaluated two cotton cultivars (SG-125 and ST LA-887) established under four different planting geometries: a) 30-in row spacing, solid planting pattern, b) 30-in row spacing, 2x1 full skip-row planting pattern, c) 40-in row spacing, solid planting pattern, and d) 40-in row spacing, 2x1 full skip-row planting pattern. Weekly white bloom counts and stratified

hand-harvests were taken from one middle row of each plot. Seed cotton yield, boll weight, total boll number, percent lint, lint yield, and fiber quality were determined for each hand-harvest. Plants from 3.3 ft of each harvest row were mapped at season's end to determine changes in overall plant growth and development.

Differences in flower development, yield and yield components, and most lint quality parameters were measured between cultivars. However, few interactions occurred between cultivars and row spacings or planting patterns. A small but statistically detectable spacing x cultivar interaction occurred in 1996 in cumulative lint yield at final harvest, with yield of SG-125 increasing more (1821 lbs/A on a planted-acre basis) in 30-in rows compared to 40-in rows (1431 lbs/A on a planted-acre basis). Cotton grown in 30-in rows consistently produced more lint (3.5% increase in 1995 and 13.8% increase in 1996) than cotton grown in 40-in rows. No differences in total boll production were found between row spacings; however, plants grown in 30-in rows produced slightly more bolls at third position sympodial locations compared to 40-in rows. Skip-row cotton produced more late-season flowers and bolls, which resulted in increased boll production (21.8% increase) and lint yield development (25.4% increase) on a planted-acre basis for skip-row cotton compared to solid-planted cotton. Both boll weight and micronaire were affected by row spacing, planting pattern, and their interaction at various harvest dates, with larger bolls and higher micronaire values associated with skip-row patterns and 30-in rows at several harvest dates. Elongation, 2.5 and 50% span length, and strength were generally unaffected by all treatments except cultivar.