# IMPACT OF ROW SPACING AND VARIETY ON COTTON FRUIT DISTRIBUTION AND YIELD

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## Abstract

A field experiment was conducted during the 2019 growing season to evaluate the impact of row spacing and variety on development, fruit distribution and yield of cotton (*Gossypium hirsutum*). This study was conducted in four locations including Starkville and Stoneville, Mississippi, Belle Mina, Alabama, and Jackson, Tennessee. Plot dimensions were 8 rows in width by 12.2 meters in length. Plots were on 97 or 76 cm row spacings and were solid planted or were planted using a 2x1 skip row pattern. Plots were planted with a four-row cone planter designed for small plot research. Plant stand counts were taken at 14 and 21 days after planting. Height, node, and node above white flower data was taken during the first week of bloom. Prior to defoliation height, node, and node above cracked boll data were assessed. Immediately prior to harvest box mapping data were collected using the guidelines set forth by Jenkins et al. (1990). Plants were collected from 3-m section of row and each boll was hand harvested and sorted by the associated mainstem node and by sympodial branch position (Jenkins et al. 1990). The total number of plants were counted, and bolls were counted for each position and weighed by each position. Seedcotton from the vegetative branches were sorted and added to the total weights. Seedcotton yield distribution was also analyzed vertically as described by Huff et al. (2010) in which zone 1 consisted of every fruiting position from nodes 5-8, zone 2 consisted of every fruiting position from nodes 8-12, and zone 3 consisted of every fruiting position from nodes 13 and above. Seedcotton yield was collected by a spindle cotton picker modified for small plot research. Fiber quality was assessed from a 25-boll sample taken prior to harvest. All data were analyzed using the PROC MIXED procedure in SAS v 9.4 and subjected to analysis of variance. Means were separated using Fisher's Protected LSD at a significance level of 0.05.

When pooled over location, variety, and planting pattern, cotton planted on 76 cm row spacing was taller and had more mainstem nodes than cotton planted on 97 cm row spacing. Node above cracked boll counts were impacted by an interaction of row spacing and planting pattern when pooled over location and variety. The 97 cm solid planted plots took slightly longer to mature than the 97 cm 2x1 skip row plots with both 76 cm planting patterns being statically similar with the 97 cm planting patterns. Seedcotton yield was different when planting pattern was pooled across row spacing and variety. The solid planting pattern produced higher yield than the 2x1 skip row pattern when figured on a land area basis but when figured on a planted row basis the 2x1 skip row had a slightly greater yield than the solid planting pattern.

Fruit distribution at the third fruiting position was impacted by planting pattern. The 2x1 skip row pattern produced a slight increase in third position fruit compared to the solid planting pattern. The 76 cm row spacing produced a greater percentage of cotton on vegetative branch fruiting positions than 97 cm row spacings when pooled over planting pattern and variety. Position one bolls made up 56-60%, position 2 bolls made up 19-20%, position 3 bolls made up 4-5%, and vegetative branches made up 16-17% of the total seedcotton weight. Cotton partitioned on vertical fruiting zones were not impacted by planting patterns when pooled over row spacing and variety. However, cotton planted on 97 cm row spacing had slightly greater percent total weight in zone 2 compared to cotton on 76 cm rows when row spacing was pooled over planting pattern and variety. 31-32% of the total weight was located in zone 1, 39-40% in zone 2, and 11-12% in zone 3.