

**EFFECTS OF PLANT POPULATION ON
GROWTH AND DEVELOPMENT OF COTTON IN
SOUTH GEORGIA**

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Abstract

A population density study was conducted at the University of Georgia Coastal Plain Experiment Station in Tifton on a Tifton loamy sand. The cotton (*Gossypium hirsutum* L.) variety used for this study was SureGrow 404. Treatments consisted of the following seeding rates: (1) 1, (2) 2, (3) 3, (4) 4, and (5) 6 seeds/foot of row. Final plant populations were (1) 0.85, (2) 1.91, (3) 2.60, (4) 3.43, and (5) 4.37 plants/foot of row. Beginning at 60 days after planting (DAP) three row feet were harvested from each plot every 7-14 days until 120 DAP. After each harvest, the samples were disassembled for growth analysis and oven dried at 60°C for dry weight determinations. Upon crop maturity, 10 row feet from each treatment were box picked for yield distribution determination.

Results from the growth analyses indicated the lowest population density treatments contained more vegetative branches (3.5 branches/plant). Also, the lowest population density treatments contained more fruiting branches and total number of main stem nodes throughout the study period.

Leaf area index (LAI) was lower in the 1 seed/foot treatment from 60 to 75 DAP while total shoot dry weight on an area basis was not different. These data indicate plants from the lowest population treatment were partitioning less carbon into leaf mass. Also, the leaf area ratio (LAR) was lower in the 1 seed/foot treatment during the same time period. The lower LAR also indicates the lowest population density treatments were partitioning less carbon into leaf mass. These data indicate the lower plant populations were not competing for sunlight during this time.

Relative growth rate (RGR) from the 1 seed/foot treatment was highest from 60 to 75 DAP and lowest in the 6 seed/foot population density treatment. These data help explain the lack of significant differences in total shoot dry weight on an area basis.

Nodes above white flower (NAWF) was highest in the lowest population density throughout the study period, indicating maturity was delayed in this treatment.

More than 600 lbs. of lint/ac were produced on vegetative branches in the lowest population treatment. Treatments 2 and 3 produced between 300 and 400 lbs. of lint/acre on vegetative branches. The highest population density produced 70 lbs. of lint/acre on vegetative branches.

The box picking results revealed treatments 1 and 2 contributed the least to first position yield (598 lbs. of lint/ac average for both treatments) while treatments 3, 4, and 5 contributed the most (1049 lbs. of lint/ac average for the three treatments). Conversely, treatments 1 and 2 contributed the most to third position yield (198 lbs. of lint/ac average for both treatments) and treatments 3, 4, and 5 contributed the least (36 lbs. of lint/ac average for the three treatments). All treatments contributed approximately 232 lbs. of lint/ac in the second position.