

**VARIABILITY IN COTTON YIELD COMPONENTS AS
RELATED TO CULTIVAR AND POPULATION DENSITY**

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Abstract

Many in the cotton industry have voiced concern over the stagnation or even decline in lint yields and fiber quality across the U.S. cotton belt in recent years. Some have indicated the development of higher yielding cotton varieties have inadvertently resulted in decreased yield and fiber quality stability, citing decreased seed size as the culprit. The objectives of these investigations are to determine how cotton yield components are affected by seed size, cultivar and management. Two studies were conducted each in 2001 and 2002 at the University of Georgia Coastal Plain Experiment Station in Tifton. In the first study, nine commercially available cultivars differing in seed size were over seeded and hand thinned to 43560 plants/acre in a randomized complete block design. In the second study, two cultivars representing the largest and smallest seeded cultivars were over seeded and hand thinned to 14520, 36300, 50820 and 87120 plants/acre in a randomized complete block design. Four replications were utilized in all studies. At crop maturity, plants from twenty row feet (36" row spacing) were hand harvested by main stem node and fruiting position. After harvest, the seed cotton from each fruiting position was hand ginned, the seed were acid delinted and the seed surface area was determined by submersion in ethanol. Thus, boll number, boll weight, lint weight, seed number, seed weight and seed surface area were recorded from each fruiting position. Data were analyzed using PROC Mixed. Fiber parameters for bolls at each fruiting position were also determined by AFIS by Cotton Incorporated. Only the analysis of the 2001 data is complete at this time. Fiber quality measurements will be discussed in a separate communication. In general, smaller seeded varieties produced (1) lower weight of fibers per seed, (2) more seeds per boll, (3) greater lint density (seed weight basis; mg lint/mg seed) and (4) lower weight of fibers per boll. Smaller seeded cultivars, however, produced (1) more bolls per unit land area, (2) more seeds per unit land area, (3) more seed surface area per unit land area and (4) lower lint density (seed surface area basis; mg lint/cm² seed surface area). These data suggest that considerable variation exists in yield components due to seed size.