

**COMPARISON OF FIBER DEVELOPMENT AND
BOLL MATURITY BY FRUITING SITES OF AN
EARLY AND FULL SEASON COTTON
CULTIVAR**

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Abstract

In 1994, cotton (*Gossypium hirsutum* L.) bolls of two cultivars, DES 119 and Deltapine 90, were hand harvested by fruiting sites to compare their fiber properties. The two cultivars were grown in field plots in a randomized complete block design with four replications. All plants from a 10-foot section of row were box mapped in each of the four replications. The cultivars were grown under normal growing conditions with good insect control. Fiber properties of the cultivars differed significantly. Deltapine 90 fibers were stronger, shorter, more mature, flatter, and had a smaller perimeter than DES 119. Fibers that developed in early season were more mature and had a higher micronaire. Fiber from all positions of the upper nodes was stronger than fiber from middle and lower fruiting sites. First position fibers were significantly longer than third position fibers. Mature fibers were more ribbon like and had greater wall thickness when compared to immature fibers. Seed size decreased and lint percentages increased at the upper nodes. DES 119 and DP 90 produced yields of 1390 and 1441 pounds of lint per acre, respectively. Bolls from DES 119 and DP 90 from positions 1, 2, and 3 respectively produced 78 vs. 73%, 19 vs. 21%, and 4 vs. 6% of the total yield.

In 1995 this experiment was repeated using the same cultivars. Fiber measurements were made only on fiber from mainstem nodes five to twelve for all fruiting positions. Bolls of fruiting sites above node twelve were aborted due to heavy late season insect populations. Yields were only 498 and 466 pounds of lint per acre for DES 119 and DP 90, respectively. Bolls from positions 1, 2, and 3 respectively produced 51, 33, and 16% of the lint yield for DES 119 vs. 65, 29, and 6% for Deltapine 90. These abnormally low yields due to late season insect damage caused unusual fiber property and boll distribution by fruiting sites. Fruiting sites that were retained had above normal fiber properties for all positions. There were no significant differences between fruiting sites for seed size, lint percentages, maturity, perimeter, wall thickness, strength, and flatness of fiber ribbon when averaged over

cultivars. Deltapine 90 fibers were significantly stronger and shorter than DES 119. Micronaire was significantly higher at nodes nine and ten for first position bolls when averaged over cultivars. All positions two and three bolls had significantly longer fibers than first position bolls at nodes five through ten. The fruiting sites of the bolls had less influence on fiber properties in 1995 than in 1994, due to fewer bolls in 1995 when insects caused all bolls above node twelve to abort.

The two cultivars were grown in field plots in 1996 and plant mapped throughout the season to determine their rate of maturity. Ten plants with normal terminal growth were plant mapped at random within a 10 foot section of row in each of six replications. First position fruiting sites were mapped and labeled as missing fruit, square, bloom, or boll over a four week period. Node above cracked bolls were recorded for three weeks, until the cracked boll was five to six nodes below the terminal. Plots were hand harvested by fruiting sites. These data will be used to compare the rates of maturity and its effects on fiber quality between fruiting sites of the two cultivars.