

[Home](#) » [Volume 1 / 1997](#) »

Small-Sample Cotton Fiber Quality Quantitation

Authors: Judith M. Bradow, Lynda H. Wartelle, Philip J. Bauer, and Gretchen F. Sassenrath-Cole

Pages: 48-60

Textile Technology

[Full Text PDF](#) (193K)

Cotton [*Gossypium* spp.] fiber quality quantitations at the boll, locule, or seed level are limited by the large sample-size requirements of commercial cotton fiber testing instrumentation and inherent biases and high costs in time and labor of non-instrumental measurement methods. Quantitative examinations of the natural and environmentally induced variations in fiber properties were performed at the boll or locule level or during fiber development by analyzing small samples [500 fibers per sample] with a specialized airflow electro-optical particle sizer capable of rapid measurements of fiber lengths and physical maturities. The fiber samples examined were from Upland [*G. hirsutum*] or Pima [*G. barbadense*] bolls of chronological maturities ranging from 21 d post anthesis to natural boll opening. Significant variations in Upland cotton fiber lengths, diameters, cross-sections, circularities, and maturities were detected at the boll and locule levels, and these fiber-quality parameters were mapped according to open-boll position for one Upland cotton genotype. The particle sizer, with a theoretical sample size of 1 to 10 000 fibers, is a powerful new, quantitative tool for use in the development of predictive cotton fiber quality models and component and variability analyses of the bulk fiber qualities that determines marketability and utility value of a cotton crop.