UPDATE ON COTTON FIBER REFERENCE STANDARDS FOR MATURITY

Devron Thibodeaux, Joe Montalvo and Terri Von Hoven
USDA-ARS, Southern Regional Research Center
New Orleans, LA
Sherman Faught
Cotton Incorporated
Cary, NC
Eric Hequet
Texas Tech University, ITC
Lubbock, TX

Abstract

The objective of this research is to develop a set of reference standards for cotton maturity based upon image analysis of fiber cross-sections so as to accurately measure fiber wall area, outer perimeter, and circularity or degree of thickening. The following is a summary of the progress during calendar year 2000. Six bales of cotton were selected as candidates for calibration cottons. Three varieties were selected for this purpose: Acala 1517, HS26 and DP50. For each variety 2 bales were purchased, one with a low micronaire and one with a high micronaire value. The bales were exposed to an exacting blending and processing protocol similar to that used in producing the International Calibration Cotton Standards. These cotton bales have now been transformed into the form of card web. Results are reported on image analysis of fiber cross-sections of multiple subsamples of fiber from each bale (seven samples with three reps each). Approximately 600 fiber cross-sections were measured per rep. To validate these results and to begin the process of utilizing these samples to check indirect measures of maturity it was decided to test the calibration cottons with the newly improved Micromat fineness/maturity tester (F/MT) at SRRC. For the purposes of this test, four separate sample bags per bale were selected and three reps per each bale were run. In this instance a sample of 4g was introduced to the Micromat. Preliminary results indicate the following:

- Based on the low CV of both the image analysis and Micromat measurements, the blending protocol appears satisfactory.
- The image analysis reference technique continues to look promising as the method for developing maturity calibration cottons.
- Considering that correlations between image analysis and Micromat F/MT were obtained with only five bales of cotton, results for R^2 in excess of 0.9 are quite promising.
- Significant differences in slopes and offsets for the correlations between image analysis and Micromat F/MT could be attributed to the relative small number of bales used in the study.