EVALUATION OF COTTON MATURITY DISTRIBUTIONS BY AFIS

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Abstract

Traditionally, the maturity of a cotton sample containing a large number of fibers is often evaluated simply by a sole parameter, such as the mean theta value. In light of the complexity of maturity distributions, the sole-parameter approach does not appear to be reliable and sufficient in characterizing the maturity and is often invalid when the distribution is not normal. More distributional parameters should be examined and included in a new classification method. AFIS can output the maturity distribution for a tested sample, but its distribution has not been verified and validated. In this study, we compared the AFIS distributions of cotton maturity with those from the cross-sectional analysis by the Fiber Image Analysis System (FIAS). Since the latter supplies more direct and verifiable maturity measurement on each individual fiber, this comparison can be used as a validation test for AFIS maturity distributions. It has been noticed that AFIS generated much more normally distributed maturity data than FIAS does. As shown in the previous studies, most cottons possess non-normal maturity distributions, which reveals that AFIS maturity distributions may be unrealistic. In addition, AFIS also tended to give higher means, smaller SDs, skewness and kurtosis of the maturity data than FIAS. This paper will provide possible reasons for the discrepancy between AFIS and the cross-sectional image analysis.