REPEATABILITY OF HVI FIBROGRAMS ACROSS MULTIPLE INSTRUMENTS

Addisu Ferede Tesema
Eric Hequet
Texas Tech University, Department of Plant & Soil Science
Lubbock, TX
Brendan Kelly
Texas A&M AgriLife Research
College Station, TX

Abstract

Cotton has been used extensively by the textile industry to produce soft, breathable, and highly valued products. The High-Volume Instrument (HVI) can output a graphic representation of the cotton fiber length distribution called a fibrogram. Fiber length distribution is an essential parameter throughout the many processing steps found in spinning mills. However, only two values extracted from the fibrogram are currently used in the marketing system, and they are highly correlated and characterize only the longer fibers. Recent research findings, obtained on one HVI only, using the total information present in the fibrogram suggests its potential importance to the cotton industry and particularly to the spinning industry.

The goal of this study is to assess the repeatability of HVI fibrogram measurements across multiple instruments. A set of 335 samples representing a wide range of length variation was selected for this study. The samples were selected from a large population representing various growing conditions, varieties, and locations using the AFIS Upper Quartile Length (UQL) and Short Fiber Content by number (SFCn (%)) as selection criteria. Samples were conditioned at 21±1°C and 65±2% RH for at least 48 hours before testing. Three HVIs at the Fiber and Research Institute (FBRI) were used for this study. Ten fibrograms per sample were acquired on each HVI. Simple linear regressions, descriptive statistics, and t-tests were used for data analysis. The result observed revealed that the unused part of the fibrograms varies from HVI to HVI. It is not surprising as this part of the fibrograms is not calibrated. Therefore, to improve the future use of the fibrogram, a calibration procedure needs to be explored. As expected, the regular HVI outputs (calibrated) do not show differences among HVIs except in rare cases, probably due to the natural within-sample variation.