EFFECT OF NON-LINT CONTENT AND PROCESSING ON HERITABILITY ESTIMATES OF COTTON FIBER LENGTH PARAMTERS

Joao Paulo Morais
Texas Tech University, Department of Plant & Soil Science
Embrapa Algondao, Campina Grande, Brazil
Zach Hinds
Texas Tech University, Department of Plant & Soil Science
Lubbock, TX
Brendan Kelly
Texas Tech University, Department of Plant & Soil Science
Texas AgriLife Research
Lubbock, TX
Eric Hequet
Texas Tech University, Department of Plant & Soil Science
Lubbock, TX

Abstract

Fiber length is an important parameter for fiber quality, which is affected by genetics, environment, and processing. In industry-scale processing, cotton fibers are cleaned after ginning. In laboratory-scale processing, cotton samples are typically sent to fiber quality testing with no post-ginning cleaning. The difference between processing steps may create differences in the trash content for samples with the same genetic background and environment. Differences in trash content affect directly or indirectly the measurement of fiber properties, like micronaire and strength. There are few reports about trash content affecting the measurement of length by HVI and AFIS. The objective of this research was to study the impact that different trash contents may have over length measurements. We tested this hypothesis with a heritability study for length. A North Carolina mating design II was used to develop nine populations of F_2 plants. The entries were planted at the Texas Tech Research Farm in Lubbock during the 2018 season. A 50-boll-sample was hand-picked from each plot before stripper harvesting the field. A subsample from each bulk harvested sample was cleaned with a Shirley analyzer. This procedure resulted in three treatments with different trash content and processing effects while keeping constant the genetic background and environmental influence for all treatments. There are statistical differences in fiber quality parameters among the treatments. There are also numerical differences for the narrow sense heritability estimates calculated for HVI and AFIS length parameters. This is evidence that trash and processing can alter the measurement of length parameters.