BREEDING EFFORTS TO IMPROVE FIBER MATURITY: ADDRESSING FIBER LENGTH UNIFORMITY

C.M. Kelly
J.K. Dever
Texas AgriLife Research
Lubbock, TX

Abstract

Fiber maturity is critical because of its relationship with other fiber properties. Lack of fiber maturity results in weak fibers that break during harvesting, ginning and textile processing. This fiber breakage increases the number of short fibers which can affect both the mean length and length uniformity (or fiber length distribution). Without improving fiber maturity there is little chance of improving fiber quality as a whole to the level necessary to meet the future demands of the textile industry.

Previous work found that selecting for an improved length distribution or length uniformity resulted in breeding lines that had an increased maturity ratio compared to commercial varieties. These data suggested that length uniformity should be considered when addressing fiber maturity in a breeding program, because it is possible to indirectly improve fiber maturity while selecting for length uniformity.

Based on these findings, a breeding study was designed to evaluate ways of improving fiber maturity through conventional breeding methods. In theory, this should be possible by focusing on related fiber properties such as fiber length uniformity. The specific objective for the first year of this study was to evaluate fiber quality of F_2 progenies (uniformity crosses). Fiber data from the high volume instrument (HVI) and advanced fiber information system (AFIS) will be used to compare the fiber quality of F_2 progeny to parent lines. A secondary objective was to create a data set that can provide additional information about the relationship between fiber length uniformity and fiber maturity. Data from the first year of the study are presented and future strategies are discussed.