AN EVALUATION OF COTTON FIBER CROSS-SECTIONS WITH THE FIBER IMAGE ANALYSIS SOFTWARE (FIAS) Suman Lamichhane Eric Hequet Brendan Kelly Texas Tech University Lubbock, TX

<u>Abstract</u>

Cotton fiber maturity is an important fiber property as it co-determines the textile performance of cotton fibers. Immature fibers have poorly developed secondary cell walls, and they have a high propensity to break during textile processing. Whereas mature fibers have well developed thick secondary cell wall with well-organized cellulose macromolecules. Mature and stronger cotton fibers are able to withstand better the forces placed on them during spinning. Fiber maturity can be determined by examining 1 µm thick fiber cross-sections under a microscope. The Fiber Image Analysis Software (FIAS) is then used to determine fiber physical features such as cell wall thickness, perimeter, and lumen area. Recent examination suggested that the algorithm used in the FIAS software fails to properly measure the physical features of some immature fiber cross-sections. A new version of the FIAS has been developed by B. Xu team (UT Austin). The modified algorithm is assumed to improve some of the shortcomings of the previous version, especially the detection and analysis of immature fiber cross-section images used in this study were obtained from the 104 bales analyzed by Hequet et al. in 2006. Thirteen bales with approximately 4,000 cross-sections per bale were selected and analyzed on both versions of the FIAS software for comparison.