

ON CELLULOSE DEVELOPMENT IN COTTON FIBERS**Noureddine Abidi****Luis Cabrales****Fiber and Biopolymer Research Institute – Texas Tech University****Lubbock, Texas****Eric F. Hequet****AgriLife Research and Fiber and Biopolymer Research Institute – Texas Tech University****Lubbock, Texas****Abstract**

Cotton fiber maturity is a major yield component and an important fiber quality trait that is directly linked to the quantity of cellulose deposited during the secondary cell wall (SCW) biogenesis. Cotton fiber development consists of five major overlapping stages: differentiation, initiation, polar elongation, secondary cell wall development, and maturation. The transition period between 16 and 21 dpa (days post anthesis) is regarded to represent a major developmental stage between the primary cell wall and the SCW. The objective of this work is to use intact cotton fibers (no cell wall extractions) to document the changes occurring during different phases of fiber development from the day of flowering to full maturity and to illustrate the differences (if any) between genotypes in terms of secondary cell wall development and maturation. Our primary tool for this study is Fourier Transform Infrared (FTIR) spectroscopy. The IR spectra of fibers indicated that the cultivars investigated exhibited different structural evolution. The results converged to the conclusion that the transition between the primary cell wall and the secondary cell wall is genotype-dependent.

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