COMPARISON OF G. HIRSUTUM AND G. BARBADENSE CLARIFIES POTENTIAL ROLES OF CELL WALL-MEDIATED FIBER BUNDLING IN FIBER DEVELOPMENT AND QUALITY CHARACTERISTICS

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Abstract

Recently we showed that synthesis of coherent primary cell walls between adjacent fibers caused *Gossypium hirsutum* fiber to form tissue like bundles during elongation (Singh et al., 2009, *Plant Physiol.* 10: 684 – 699). This new feature of fiber development supported tight packing and coordinated elongation of many fibers in the confined locule space. We took advantage of the longer elongation period in *G. barbadense*, another polyploid species with superior fiber quality compared to *G. hirsutum*, to investigate other possible implications of fiber bundling. Data will be presented to show that *G. barbadense* fiber also forms a tissue (by a similar mechanism as previously described for *G. hirsutum*) during part of its elongation phase. Similarities and differences in the progression of fiber development between *G. hirsutum* (cv. DeltaPine 90) and *G. barbadense* (cv. Phytogen 800) grown under moderate conditions in a greenhouse were used to evaluate whether or not fiber bundling was absolutely required to support fiber elongation. Other comparative aspects of primary cell wall dynamics in the two cotton species will also be described, providing insight into how molecular details of primary wall structure may help to control fiber quality development and quality characteristics. For research support, we thank Cotton Incorporated, Cary, NC.