

1838 Gene Expression Profiling in the High Fiber Quality Cotton (*Gossypium hirsutum* L.) Germplasm Line MD 52ne and its Recurrent Parent MD 90ne

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Gene expression profiling was conducted on two near-isogenic cotton (*Gossypium hirsutum* L.) germplasm lines using a cotton oligonucleotide microarray. The two germplasm lines are a high fiber quality variety, MD 52ne, and its recurrent parent, MD 90ne. MD 52ne has approximately 10% higher fiber bundle strength, 22% less short fiber, and 7% longer mean fiber length than its near-isogenic recurrent parent MD 90ne (Meredith, 2005a). Based on genetic studies, the improved bundle strength of MD 52ne is controlled by a small number of genes (1.23 ± 0.16) (Meredith, 2005b). A comparison of cotton fiber gene expression profiles in MD 52ne and MD 90ne was performed during fiber elongation and secondary cell wall synthesis stages, specifically 8, 12, 16, 20, and 24 days post anthesis (DPA). Fiber samples were collected from field plots in a randomized block design, with three spatially distinct biological replications for each germplasm at each time-point. The microarray hybridizations were performed in a loop experimental design, which allowed for monitoring gene expression profiles over time in one germplasm relative to the other.