

1925 Fiber quality QTLs in Diploid Cotton

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Cotton fiber quality properties are an essential predictor of yarn performance. A genome-wide comparison of the genetic factors that control fiber quality properties was conducted by discovering quantitative trait loci (QTLs) that explain phenotypic variation for HVI and AFIS parameters. Twenty-six measures of quality were examined in an A-genome diploid lineage consisting of 129 F₂ individuals and F₃ families. A total of 58 QTLs, which explained 4.1 to 46.3% of the total phenotypic variation for each measure, were distributed across the cotton genome. QTL-rich chromosomal regions occurred at higher frequency than singletons along. This clustering of fiber quality QTLs was largely explained by fiber quality parameters measuring like traits (i.e. length and UQL) and developmental consequences (i.e. poor strength and immature fibers). The hypothesis that the D-subgenome of tetraploid cotton has a higher propensity to give rise to new fiber quality alleles was investigated by comparing the collinearly and allelic effects of each QTLs with those from prior studies. If true, orthologous QTLs should explain a major of the phenotypic variation within the diploid population.