

WATER DEFICIT STRESS INDUCED GENE EXPRESSION**B.Todd Campbell****Wonkeun Park****Phil J. Bauer****USDA-ARS****Florence, SC****Brian E. Scheffler****USDA-ARS****Genomics and Bioinformatics Research Unit****Stoneville, MS****Abstract**

In the face of changing climatic conditions, water deficit stress is one of the most challenging agricultural issues limiting sustainable cotton production. Many efforts have been incorporated using genetic and genomic approaches to identify valuable molecular resources. We are using two primary approaches to study water deficit stress and cotton at the molecular level. The first approach focuses on the role a specific gene family plays in water deficit stress. The second approach is very broad and focuses on identifying a genome-wide suite of genes that are responsive to water deficit stress. In this report, we will update our progress on both approaches to study cotton and water deficit stress at the molecular level. We have identified the large aquaporin gene family in cotton and characterized gene expression patterns in various plant tissues in response to water deficit stress conditions. We have also identified a suite of genome-wide genes showing differential expression patterns in response to water deficit stress. In total, the genes described in this report offer potential targets for improving cotton water use efficiency under water deficit and well-watered environmental conditions.