THE ROLE OF ABA-RESPONSIVE TRANSCRIPTION FACTORS IN THE REGULATION OF COTTON DROUGHT STRESS TOLERANCE

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Abstract

Drought adversely impacts plant growth and reduces productivity. As aquifers are depleted, and rainfall distributions shift, the development of crops that can thrive with less water is necessary to maintain yield and increase sustainability. ABA-responsive element binding factors (ABFs) play a crucial role in regulating plant responses to drought stress. Our results have shown that constitutive expression of ABF3 from Arabidopsis (AtABF3) in cotton leads to increased tolerance to water deficit stress. However, expression of this heterologous transcription factor also caused delayed development and reduced productivity. One strategy to achieve the stress tolerance associated while avoid the negative consequences of ABF3 expression is to use native ABF genes from cotton that may be more accurately controlled by the post-transcriptional regulatory system that comprises the ABA signaling pathway. To accomplish this, cDNAs that represent members of the cotton ABF gene family were cloned and characterized. After the development of gene specific primers, the expression of each *ABF* gene will be analyzed and the evolutionary relationships between these genes in tetraploid cotton will be determined. Finally, comparative functional analysis of the role of cotton ABFs as regulators of stress responses in transgenic cotton plants will be carried out. We anticipate that the results of this work will provide novel strategies for the optimization of abiotic stress tolerance in cotton.