IDENTIFICATION OF ELITE UPLAND GERMPLASM WITH TOLERANCE TO REDUCED IRRIGATION RATES FROM THE RBTN

Bralie R. Hendon Texas Tech University Lubbock, TX Mauricio Ulloa John J. Burke USDA-ARS-SPA-CSRL Lubbock, TX Glen L. Ritchie Robert Kelby Imel Dick L. Auld Texas Tech University Lubbock, TX

Abstract

The decline in aquifers and water reservoirs combined with the unpredictability of precipitation during the growing season has pushed cotton (*Gossypium* spp.) researchers and breeders to look/develop sources of germplasm with specific plant-architecture, root-morphology, or physiological traits that can improve water use efficiency (WUE), drought and extreme heat tolerance. To identify germplasm with improved WUE and drought tolerance, elite upland germplasm lines were evaluated from the Regional Breeders Testing Network (RBTN supported by Cotton Incorporated) of 13 U.S. public breeding programs across the Cotton Belt. RBTN germplasm lines and commercial cultivars were subjected to four water regimes (high, high-medium, medium, and low) on drip irrigation with three replications (25 feet single row per entry) in a RCBD within each regime. Preliminary analyses revealed genetic diversity and differences such as plant height, nodes, fruiting positions, flowering, and early open bolls. We also observed differences of spectral reflectance and canopy temperature on these entries. Plant mapping data combined with collected data using spectral reflectance and canopy temperature sensors will further be discussed. Continuing cotton improvements depend on the utilization of diverse germplasm and the introduction of this genetic diversity into commercial cultivars.