IDENTIFICATION OF COMMERCIAL CULTIVARS FOR THE TEXAS HIGH PLAINS WITH DROUGHT TOLERANCE OR IMPROVED RESPONSE TO WATER DEFICITS

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Abstract

There is a pressing need to identify and develop commercial cultivars or germplasm that can minimize the elevated cotton production risks associated with water stress or crop water deficits. Cotton (*Gossypium* spp.) researchers need to 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 commercial cultivars for the Texas High Plains that can minimize the elevated production risks associated with crop water deficits, 15 commercial cultivars representing the private sector of the areas were subjected to three water drip-irrigation regimes (high, medium, and low). This study had three replications and four row plots 25 feet per entry arranged 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. Differences on responses to drought tolerance were also observed using 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. The identification of commercial cultivars and/or germplasm that can sustain yield under drought or limited irrigation is essential for the survival of our cotton industry and associated economic benefits to producers.