

Evaluation of the U.S. Minicore Collection under Water Deficit in Three States

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The U.S. minicore collection was grown in replicated trials under water limiting conditions in Virginia, Oklahoma, and Texas in 2017. Data collected during the growing season included flower count, SPAD chlorophyll meter reading (SCMR), normalized difference vegetation index (NDVI), canopy temperature, leaf closure rating, wilting rating, plant height and plant width. Pod yield was measured after harvest. Significant differences were observed among genotypes for all traits measured. Many minicore accessions had consistent phenotypic responses across environments, and significant correlations among traits across locations were observed. Additionally, high-throughput phenotypic data were collected utilizing ground-based platforms with light detection and ranging (LiDAR) sensors and unmanned aerial vehicle (UAV) platforms equipped with visible, near infra-red and thermal cameras to determine the efficacy of these technologies compared to older screening methods. A subset of twenty contrasting minicore accessions has been selected for use in more detailed experimentation and validation of high-throughput technologies.