

1228 Evaluation of chlorophyll fluorescence for the identification of drought tolerance in upland cotton

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As plant breeders continue their search for an effective and efficient method for drought tolerance in large segregating populations, plant physiologists have found chlorophyll fluorescence (CF) to be a valuable tool to monitor plant stress response. The objectives of this field study were to [1] classify an array of genotypes according to CF and [2] evaluate the feasibility of CF as a tool for drought tolerance evaluation in cotton breeding programs. A drought bioassay was conducted in which leaf punches are harvested at predawn since water-stressed plants will not mobilize carbohydrate reserves overnight so source leaf samples will maintain higher levels of CF under high temperature dark incubation, with the opposite being true for non-stressed plants. Twenty genotypes were evaluated at two locations over two years in a split plot design of a randomized complete block with irrigation treatment as main plots and genotypes as subplots. The data indicate that variability exists for CF among the 20 genotypes. Rankings are especially consistent at the high and low ends of the mean separation for CF values.