

GENOTYPIC VARIATION IN THERMOTOLERANCE OF PHOTOSYNTHETIC PROCESSES FOR DIVERSE COTTON GENOTYPES**Navneet Kaur****John L. Snider****Andrew H. Paterson****Gurpreet Virk****University of Georgia****Tifton, GA****Abstract**

Genotype and environmental factors are the main factors that affect cotton growth and development. Over the last few decades, breeding programs have mostly focused on yield enhancement which has resulted in a high degree of genotypic uniformity among commercially produced cotton cultivars. The lack of focused selection for abiotic stress tolerance, such as tolerance to high temperature extremes, may leave the cotton crop more prone to heat-induced yield loss in the future. A study was undertaken at the Lang-Rigdon Research Farm, Tifton, GA, and the Iron Horse Farm, Athens, GA to examine genotypic diversity in thermotolerance of photosynthetic processes in diverse cotton genotypes. The study included 10 diverse cotton genotypes arranged in a randomized complete block design with 8 replications. During early flowering, heat tolerance of photosynthetic parameters was determined by finding the high temperature threshold that resulted in a 15% reduction in photosynthetic efficiency (T15). Heat tolerance showed significant genotypic variation, although the response was location and photosynthetic parameter dependent. We also discovered that electron transport between the two photosystems was significantly more heat sensitive than photosynthetic processes in photosystem II or photosystem I.