



Soybean physiology and gene expression during drought

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ABSTRACT. Soybean genotypes MG/BR46 (Conquista) and BR16, drought-tolerant and -sensitive, respectively, were compared in terms of morphophysiological and gene-expression responses to water stress during two stages of development. Gene-expression analysis showed differential responses in *Gmdreb1a* and *Gmpip1b* mRNA expression within 30 days of water-deficit initiation in MG/BR46 (Conquista) plants. Within 45 days of initiating stress, *Gmp5cs* and *Gmpip1b* had relatively higher expression. Initially, BR16 showed increased expression only for *Gmdreb1a*, and later (45 days) for *Gmp5cs*, *Gmdefensin* and *Gmpip1b*. Only BR16 presented down-regulated expression of genes, such as *Gmp5cs* and *Gmpip1b*, 30 days after the onset of moisture stress, and *Gmgols* after 45 days of stress. The faster perception of water stress in MG/BR46 (Conquista) and the better maintenance of up-regulated gene expression than in the sensitive BR16 genotype imply mechanisms by which the former is better adapted to tolerate moisture deficiency.

Key words: Photosynthesis and real-time quantitative PCR; Drought; *Glycine max*