

Variation in genotypic responses and biochemical analysis of callus induction in cultivated wheat

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ABSTRACT. Wheat is notorious for callus induction, which is a major hindrance in direct gene transfer and consequently for genetic improvement programs. In order to provide a successful platform for gene transformation, good callus quantity and quality is important. We investigated the variation in callus induction capabilities of Pakistani wheat cultivars and measured the reducing sugar content in the induced calluses. Ten elite wheat varieties, developed and cultivated in Pakistan were selected on the basis of agronomic and stress tolerance parameters. Significant differences were found

between and among wheat cultivars for callus induction response, shoot length and callus quality. The callus induction responses of Punjab-81, Punjab-96 and Zarghoon-79 were found to be the best among the 10 varieties. The induced calluses were of two types, embryogenic (hard) and non-embryogenic (soft). The seeds gave good germination. The highest reducing sugar concentration was found in cultivar Sutlaj-86, which needs to be tested for stress resistance, a measure of its utility for genetic engineering programs. The relative callus induction rate and reducing sugar content of the wheat cultivars were found to be genotype-dependent.

Key words: Callus; Embryogenic; Genotypic response; Tissue culture; *Triticum aestivum*; Wheat