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Efficient genetic transformation of durum wheat (*t. Durum*) mature embryos using a gus visual selection strategy

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Abstract

The *E.coli* β-glucuronidase gene (GUS) was used as visual selectable marker to produce transgenic durum wheat (*Triticum durum*) following *Agrobacterium*-mediated transformation. Various *Agrobacterium* strain strains and durum wheat cultivars form Mediterranean genotypes were used for transformation. Prior to our initiating stable transformation experiments, we first used preliminary assays to determine the best components and conditions to use for stable transformation. These assays focused mainly on: explant type, *Agrobacterium* strain, *Agrobacterium* cell density and T-DNA delivery. Our results showed that transformation efficiency was mainly dependant on explants type, *Agrobacterium* strain and acetosyringone concentration. Using optimized conditions, embryogenic cultures were initiated from mature embryos. Selection of transformed tissue was carried out using GUS as sole screen or a non selection protocol. Transgenic wheat plants were regenerated and found to harbour and express the GUS gene. A final transformation frequency of 6 % was achieved using this protocol. These methods were used to overexpress key genes involved in drought and salinity tolerance in wheat.