A new selection system for i.a. transgenic rapeseed, based on galactose as selective agent and a UDP-glucose:galactose-1-phosphate uridyltransferase gene as selective gene

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A new selection system based on galactose as selective agent and a UDP-glucose:galactose-1-phosphate uridyltransferase gene as selective gene is presented. A broad range of plant species, including agronomically important crops such as rapeseed is sensitive to low dosages of galactose. The toxicity of galactose is believed to be due to accumulation of galactose-1-phosphate, generated by endogenous galactokinase after uptake. Here, it is demonstrated that this toxicity can be sufficiently alleviated by the *Agrobacterium tumefaciens*-mediated introduction of the *E. coli* UDP-glucose:galactose-1-phosphate uridyltransferase (*galT*) gene, driven by a 35S-promoter, to allow transgenic shoots of potato and rape seed to regenerate on galactose containing selection media, resulting in high transformation frequencies (35% and 4% for potato and oil seed rape, respectively). Analysis of genomic DNA and UDP-glucose:galactose-1-phosphate uridyltransferase activity in randomly selected potato transformants confirmed the presence and active expression of the *galT* gene. The agricultural performance of transgenic potatoes was evaluated by monitoring the phenotype and tuber yield for two generations and these characters were found to be indistinguishable from non-transgenic controls. Thus, the galactose selection system provides a new alternative being distinct from conventional antibiotic and herbicide selection systems as well as so-called positive selection systems where the selective agent has a beneficial effect.