

PROCEDURES WHEREBY GENETIC MATERIAL MAY BE ADDED TO
THE SOYBEAN GENOME USING CERTAIN STRAINS OF
AGROBACTERIUM TUMEFACIENS

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Abstract

The stems and petioles of ten soybean (*Glycine max*) cultivars, Forrest, Ransom, Impala, Oribi, Ibis, Pioneer 577G, A5308, Highveld Top, Duiker and Edgar, were inoculated with *Agrobacterium tumefaciens* strain A281. This *Agrobacterium* strain induced large fast growing tumours on the control plant, the sunflower. Tumours were successfully induced on the soybean by injecting inoculum into the plant stem and petiole. The soybean varieties most susceptible to strain A281 were inoculated with an *Agrobacterium tumefaciens* strain harbouring the plasmid, pGV2100, which has attenuated virulence. Addition of acetosyringone increased the virulence of the bacterial strain resulting in an increase in percentage transformation and in tumour size. The cultivar, Highveld Top, was most amenable to infection by strain A281, whereas Forrest responded most favourably to infection by pGV2100.

Procedures were introduced to detect the presence of octopine in the pGV2100-induced tumours. Tissue culture techniques were employed to determine the callus-forming ability of the soybean varieties and to compare the response of uninoculated and inoculated tissue to tissue culturing *in vitro*. Techniques were employed to isolate the total DNA and the Ti-plasmid from the bacterial strains and to isolate the DNA from the plant cells.