

Genetically engineered groundnuts for better yields

In India, scientists at the Indian Institute of Science (IISc) and the Rubber Research Institute have perfected a technique for the mass production of genetically engineered groundnuts through tissue culture. Groundnut (*Arachis hypogea*), one of the principal economic oilseed legumes, is widely cultivated in many tropical and sub-tropical regions of the world for vegetable oil as well as human and animal consumption. Improvement of this commercially important crop through conventional breeding techniques is not rapid enough to fulfil the growing demands of the burgeoning population.

The new technique is based on two principles. First the groundnut cotyledons are cultured in a special nutrient medium and then co-cultured in another medium with *Agrobacterium tumefaciens*, which acts as a vehicle to deliver foreign genes into the cotyledon. This method helps obtain transgenic plants with a high frequency that is not possible with current techniques.

The team sterilized and germinated groundnuts in a medium containing sucrose and agar gel. Cotyledons from a week-old seedlings were used for genetic engineering studies in which a strain of *Agrobacterium tumefaciens* was used as a vehicle to introduce two genes, uidA and nptII, which help in B-glucouronidase synthesis. The cotyledons were shaken in a suspension of *Agrobacterium tumefaciens* and cultivated together with it. After co-culture, the cotyledon pieces were transferred into another medium containing antibiotics. The embryos generated were cultured again in a fresh media in which they developed healthy green shoots and roots. Presence of the two genes in the new plants was confirmed by the polymerase chain reaction (PCR) method. (Chemical Weekly, 8 August 2000)