Notes

Genetic engineering of groundnut for crop improvement: Current status and future prospects

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Peanut or groundnut (*Arachis hypogaea* L.) is a key commodity in the livelihoods of the rural poor in the semi-arid tropics. Several biotic and abiotic constraints, lack of high yielding adapted cultivars and aflatoxins adversely affect its productivity, quality and international trade. Inadequate resistance in the available germplasm for some of these constraints necessitates the use of modern biotechnological approaches including transgenic technology which provides an attractive alternative for the development of enhanced germplasm. Extensive efforts have been made at ICRISAT to develop efficient tissue culture and *Agrobacterium tumefaciens*-mediated genetic transformation protocol for peanut by using the cotyledon explants from mature seeds. This protocol is highly efficient and available for routine applications including the development of marker-free transformants for the recovery of clean transgenic events at high transformation frequencies (50-70%). A pipeline of genetically engineered peanuts for several traits are in different stages of development and validation. These include resistance to viruses like the *Tobacco streak virus* and the *peanut bud necrosis virus*, resistance to *Aspergillus flavus* and aflatoxin contamination, tolerance to drought stresses, and nutritional enhancement by the over-production of ß-carotene. A major emphasis is on robust phenotyping of these events under greenhouse and contained field conditions, and translational research for product development and commercialization. These strategies will allow effective use of the transgenic technology in conjunction with conventional plant breeding for sustainable crop improvement in the dryland tropics of the world.

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