# The Groundnut Story: A Public-Private Initiative Focused on India

Groundnut, or peanut (*Arachis hypogaea*) is a staple oilseed crop grown for food and for forage in India. It is cultivated on 7.5 million hectares with annual production of about eight million tons. More than five million small and marginal farms depend on this crop for their viability.

During the monsoon season of 2000, a new groundnut disease emerged in India. The spread of the disease grew to epidemic proportions causing crop loss corresponding to more than US$65 million. The causal agent of this devastating disease was found to be tobacco streak virus (TSV), which causes stem necrosis in the groundnut plant resulting in complete destruction of the crop. In addition, TSV infects several other economically important crop plants, such as sunflower and marigold, and lives in many weed hosts. Parthenium, a prevalent weed, is a symptomless carrier of TSV and plays a major role in the perpetuation and spread of the disease. The constant threat of TSV outbreak has caused food shortages and financial insecurity for groundnut farmers.

By nature, groundnut plants show little resistance to TSV. Moreover, all currently grown cultivars are susceptible to TSV infection. Therefore, a nonconventional method of incorporating disease resistance in the cultivars was needed to control the disease. Transgenic crop plants that express the coat protein (CP) gene of the target virus pathogen have been shown to provide a high degree of resistance to many plant viruses. The Agricultural Biotechnology Support Project II (ABSPII), which focuses on safe and effective development and commercialization of bioengineered crops in order to benefit resource-poor farmers in developing countries, decided to fund the bioengineering of groundnut genotypes to incorporate the CP gene for conferring TSV resistance.[1]

## LICENSING ARRANGEMENTS

Sathguru Management Consultants, the regional coordinator of the ABSPII project in South Asia, approached the Donald Danforth Plant Science Center (the Danforth Center) for the development of a vector construct containing the TSV-resistance gene for conferring viral resistance to groundnut plants.

The CP technology for conferring resistance to viral infection is owned by Monsanto Company. A patent nonassertion agreement[2] from Monsanto for the CP technology to be used for nonprofit public good was obtained by the Danforth Center. This non-assert was facilitated by the ABSPII project. The Danforth Center further developed the technology for TSV-CP-mediated-resistance in groundnut to be deployed in South Asia and Southeast Asia.

A consortium of public institutions was formed by ABSPII with International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and Acharya N. G. Ranga Agricultural University (ANGRAU) in the state of Andhra Pradesh. These institutions were the primary licensees of the technology developed by the Danforth Center for TSV-resistant groundnut cultivars.

With Sathguru Management Consultants as facilitator of the technology transfer, a nonexclusive licensing agreement was penned for nonexclusive licensing of the CP technology, free of royalties and upfront payments, to public institutions planning to develop the varietal groundnut. A tripartite agreement was arranged, with the Danforth Center as the technology licensor and Sathguru Management Consultants and ICRISAT as licensees. Development efforts of TSV-resistant groundnut by the public research institutions are underway and slated for commercialization in 2009.

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Similar nonexclusive licensing arrangements have been made with private organizations for the development of hybrid groundnut cultivars. These licenses include upfront and royalty payments and an understanding with regard to benefit sharing.

## POLICY COMPONENTS

Because groundnut is a so-called orphan crop, there was little interest in producing and selling open-pollinated varieties owing to their susceptibility to viral infection. Moreover, private industry lacked the motivation to commercialize hybrid varieties. Key policy makers for the ABSPII project secured financial support for developing and distributing the TSV-resistant groundnut and for facilitating the project through planning and implementation.

## KEY LESSONS LEARNED

Technology can be a major force in alleviating poverty and increasing food security in developing countries. Moreover, investment gains can be multiplied by adopting technologies in different regions through the creation of synergic partnerships for product development, implementation, and commercialization. ■

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1 www.absp2.cornell.edu.

2 See also, in the *Handbook*, Chapter 7.6 by Anatole Krattiger titled, The Use of Nonassertion Covenants: A Tool to Facilitate Humanitarian Licensing.