

Tomatoes Resist Whitefly Attack

In India tomatoes are one of the main vegetable crops, providing a tasty and nutritionally important component of local dishes. Tomato farming is problematic. Tomato production is constrained by tomato leaf curl virus (ToLCV) disease transmitted by the whitefly, *Bemisia tabaci*, which also causes direct damage. These constraints can lead to total loss of the tomato crop affecting livelihoods of the rural poor. Until recently, farmers in south India have managed the pests through spraying a cocktail of insecticides. Women are involved in weeding and harvesting the crop and they in particular are exposed to high levels of insecticides. Previous phases of this project successfully developed three ToLCV-resistant tomato varieties, as well as non-pesticide based management practices. The tomato lines have highly prized characteristics and also meet the increasing consumer desire for pesticide residue free and organic produce. During the lifetime of the research women have organised themselves into self-help groups interested in adding value to the tomatoes, e.g. tomato juice, tomato puree, tomato chilli sauce, solar-dried tomatoes etc.

Throughout the lifetime of the project, the University of Agricultural Sciences, Bangalore (UASB) has set new precedents. The Vice Chancellor, Dr Krishnappa, has been particularly keen to ensure that, “the roots of the research are not fed only by the public sector, while the fruits are harvested only by the private sector”. Under



Project developed ToLCV-resistant tomato varieties can be grown successfully without the need for insecticide sprays, thus avoiding the need for this farmer's family to spray his crop

his stewardship, the three ToLCV-resistant varieties were sold to ten commercial seed companies under a non-exclusive licence to use them in the development of resistant hybrids, and to market them. This is the first time that the UASB has sold a variety to the commercial sector. The National Seed project at the UASB has set up a ‘revolving fund’, where receipts from the sale of seeds are used to produce more seed for sale, to ensure the sustainability of seed production after project funding ends. This activity will also ensure that seed of the varieties will be available to the poorest tomato growers at a minimal cost.

An impact assessment showed that Indian farmers can make 10 times the profit growing the project's tomatoes, compared to ToLCV susceptible varieties. Families used this extra income for children's education, healthcare and diet. In the next few years, seed promoted by the commercial, public and NGO sectors will be grown by hundreds of thousands of farmers in India. Further impact will accrue as the project partner, ASEAN Vegetable Development and Research Center (AVRDC), has distributed the seed varieties to 13 other countries (including China and Brazil). A website is being constructed (www.mensacomp.com/tomato) and will shortly be sited within the UASB's website.

R8247: Promotion and impact assessment of tomato leaf curl virus disease resistant tomatoes: phase III of sustainable management and molecular characterisation of *Bemisia tabaci* and tomato leaf curl virus (ToLCV) on tomato in India

Contact: Dr John Colvin, Natural Resources Institute, UK



The project's ToLCV-resistant variety Vybhav (left) and a resistant hybrid developed from it (right) by Namdhari Seeds – promising hybrids are now being tested in multi-location trials by Namdhari to assess their performance in different regions of India