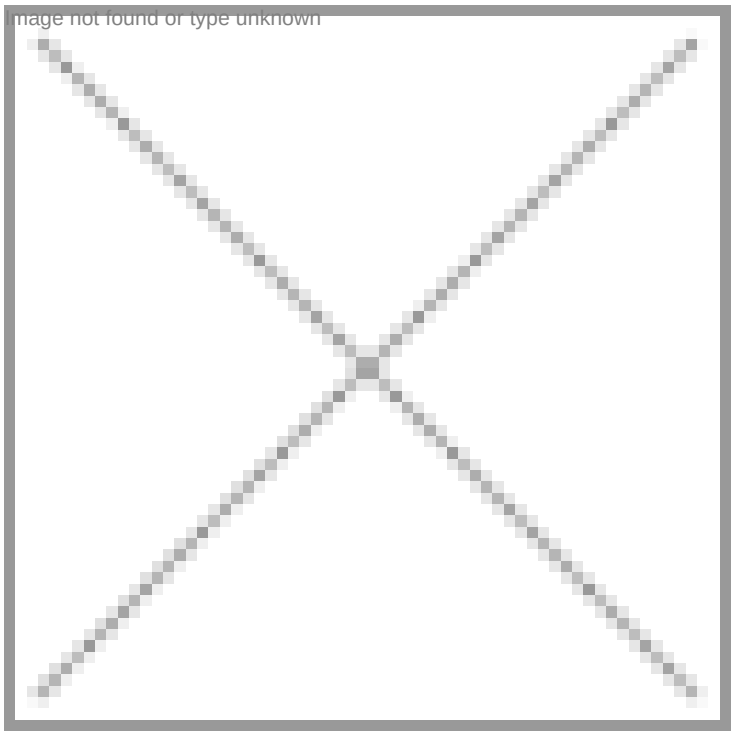
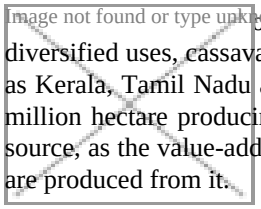
BioSpectrum the business of Bio & Health Sciences

Virus resistant cassava plants

06 September 2012 | News



The joint project to produce virus-free transgenic cassava by the trio Rasi Seeds, Tamil Nadu Agricultural University and Madurai Kamaraj University found support from SBIRI scheme of DBT



ion of cassava starch known as 'sabudana' is very popular in India. By virtue of its diversified uses, cassava has become an important commercial crop in the agricultural economy of states such as Kerala, Tamil Nadu and Andhra Pradesh. As per various reports, it is cultivated in India in an area of 0.2 million hectare producing 5.5 million of tuberous roots. This drought-tolerant crop is an attractive nutrition source, as the value-added products such as starch, sago, chips, flour from chips, thippi, peel, and sago wafers are produced from it.

However, the presence of Indian mosaic virus has been a great concern for the farmers cultivating it. Hence, a joint project on transgenic cassava production with genes conferring resistance to Indian cassava mosaic virus (ICMV) disease was initiated by Rasi Seeds based in Salem district of Tamil Nadu along with Tamil Nadu Agricultural University (TNAU) and Madurai Kamaraj University (MKU), Madurai. The basic aim was to standardize methodology for regeneration of Cassava plants in tissue culture and study the incorporation and level of expression of transgene(s) in putative cassava transgenic events. The project initiated on March, 2008, received funding amount worth 68.53 lakh from Small Business Innovation Research Initiative (SBIRI) scheme of Department of Biotechnology (DBT).

Among the three partners, TNAU has done sequence analysis of the virus strains of ICMV and Sri Lankan cassava mosaic virus (SLCMV) and made gene constructs using RNAi system. While MKU has made virus resistance gene construct using antisense technology for SLCMV, those constructs were used in Rasi Seeds

lab for genetic transformation of Cassava for conferring resistance to cassava mosaic disease. At present several putative transgenic Cassava plants have been produced to protect against ICMV and SLCMV using viral resistant gene(s). These transgenic cassava plants are maintained in polyhouse conditions. The project was completed in September, 2011 and is now moving towards the phase II.

â€œIt has been a very good opportunity to work with TNAU which made significant contribution and provided technical knowledge for the project. Also it was a good opportunity for us to interact with Dr K Veluthambi, professor, MKU on guidance in running the project,â€? said Dr Saravanakumar, principal scientist, biotech, Rasi Seeds, expressing his gratitude to the partners in the project.

Way forward

The project still holds tremendous relevance, with the stability of virus resistance yet to be tested in transgenic plants and the project in its developmental phase II. The virus resistance transgenic cassava plants have to be tested for tuber yield and starch content in confined field trials through phase II multiplication and the testing of transgenic cassava plants will be done during the phase. Due to mixed infection of ICMV and SLCMV, it is also desirable to develop lines with fusion gene with conserved region of the two viruses.

The freedom from these two viruses can certainly increase the production of cassava, which in turn will boost the economy of southern states and also benefit the poor farmers who own marginal lands.

Rahul Koul