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Platform for Translational Research on Transgenic Crops

Crossing Over



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Agriculture Biotechnology has been the priority area of research in India. DBT has made sustained investments to set up centers of excellence, support basic and applied R&D in universities/institutions. Today, more than 200 laboratories and 1000 researchers in public and private sectors are engaged in plant biology, genetic transformation research and development; molecular marker assisted breeding, genome sequencing and functional genomics. According to data with regulatory agencies, 24 universities, 37 research institutions and 45 private sector companies are working on plant transgenics in about 30 crops involving a dozen of genes for traits related to resistance/tolerance to fungal/bacterial/viral diseases; insects; drought, salinity and alkalinity and herbicide; nutritional factors (Fe, carotene, protein, amino acids); hybrid production etc. However, some of the major bottlenecks in successful transfer of this technology from lab to land revolve around the delays in transferring the products of genetic engineering to the farmers' fields



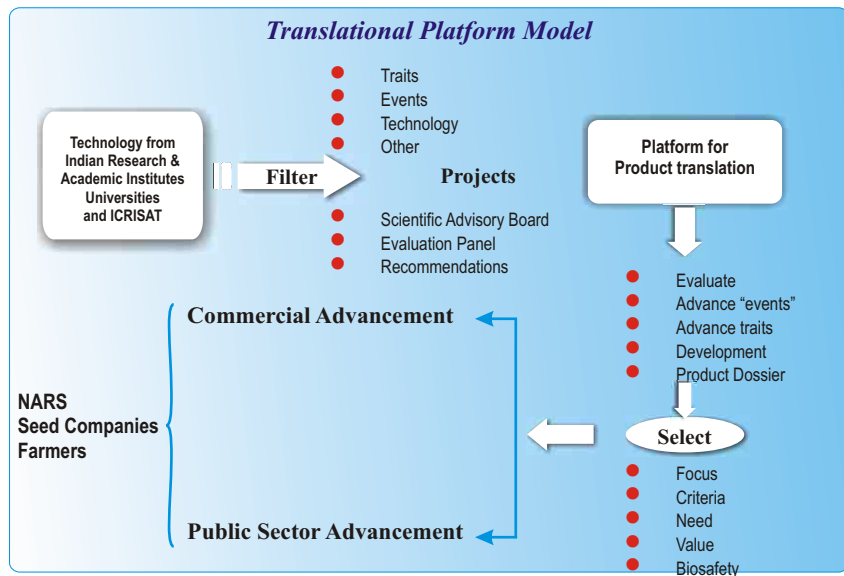
In practice, plant transgenic product development involves an elaborate pathway of innovation value chain over a period of years with defined elements of basic research, translational research, development, verification and validation, prototype development, field trials, production/manufacturing and

marketing. These major elements of the value chain have sub-activity or sub-task to cater to unique differences between biotechnology products for public/private good requirements. No scientist or agency either in private or public sector has all the expertise, technical and financial resources; management ►►

► systems to complete the tasks of innovation value chain. In addition, increasing demands of regulation, intellectual property rights and public acceptance have made agri-biotech R&D and innovation more complex.

To fill this interface between lab and land, Department of Biotechnology, has set up an innovative Technology Platform for Translational Research on Transgenic Crops (PTTC) at International Crops Research Institute for Semi-arid Tropics (ICRISAT), Hyderabad. The platform leverages ICRISAT's existing excellence in the areas of transgenic research on crop plants, molecular plant sciences and plant breeding to improve its ability to enhance the delivery of transgenic crops in agriculture. The main mission of this platform is to “translate transgenic technology and harness its products to meet the needs of agricultural growth”.

The PTTC is being proposed as an initiative to blend green revolution with gene revolution to enhance agricultural productivity in a sustainable manner. PTTC can be viewed as a “clearing” house for innovative ideas and technologies in plant genetic engineering that could positively impact Indian agriculture, with the objective of providing expertise and facilities for the production and assessment of transgenic plants. The aim is to establish an “entity” which will serve to evaluate potential new genetic engineering options and then advance these, in a focused way, to meet specific objectives in agriculture. Acting as a clearing house for technology inputs, transgenic research leads and prototypes with proof of concept derived from Indian research institutes and universities, the PTTC would help evaluate concepts, ideas, and technologies. It will also recommend advancement of the most promising concepts through prioritization through



a well-coordinated approach arising from networking among various research institutions, the industry and the government. PTTC would also create specific projects with defined milestones and endpoints and their effective management. These “evolved” technologies could then be transferred to the private or public sector for advancement to the farmers.

Specifically PTTC will:

- develop the physical infrastructure to conduct transgenic research.
- evaluate specific concepts, ideas and technologies, and “evolve” the technology to a point where a practical application can be demonstrated and transfer this “evolved” technology to the private or public sector for advancement.
- carry out detailed examination of IPR issues associated with the transgenic product development and develop bio-safety dossiers for commercialization of the product, and
- identify partnerships for sharing mechanisms for seed registration and marketing of the final “product”.

PTTC will operate through collaboration with a larger research community beyond the boundaries of a single institution which would be facilitated and established by using the 'Hub and Spoke' model. In other words, PTTC would serve as the locus for the

basic infrastructure for research, training and outreach activities, with setting up a series of specialized centers which will serve as centers for transfer of proven technologies and also leverage convergence between various fields of related disciplines and provide support in priority areas of transgenic research. The major objective will be to develop synergistic links with different research institutes, universities and industry offering various services including contract research on tissue culture and transformation, product development along the value chain, consultancy services, intellectual property advice and management, and guidance on bio-safety issues including communications and training. Hence, the PTTC would serve as a center of reference to strengthen national, regional and international linkages and collaboration in transgenic research and development, exchange of materials and information and to support training, consultation and commercialization of technologies. ■

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