

**Introductory Remarks At Conference On
New Plant Breeding Molecular Technologies – Technology
Development And Regulation**

By

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It is a pleasure for me to welcome you to this International Conference on New Plant Breeding Molecular Technologies: Technology Development and Regulation. We selected Jaipur or the pink city, as it is called, for the venue because it is a historic place, is of great interest to tourists and offers good conference facilities.

I am particularly grateful to speakers from abroad who have travelled all the way from Argentina, US, France, Belgium, Netherlands, Germany, Greece, South Africa, Japan and Australia. (That makes this conference truly international and representative)

This Conference is organized jointly by the Indian branch of International Life Sciences Institute, or ILSI-India for short, and the Department of Biotechnology, Government of India and cosponsored by Crop Life International and the Centre for Environmental Risk Assessment, or CERA. I must express my gratitude to DBT for supporting this Conference and to Dr Rao in particular who drew our attention to the importance and potential of new plant breeding technologies and encouraged us to organize this conference. We had also support from National Seeds Association of India and some of our corporate members who are identified in our Conference documents.

I am sure most of you are familiar with ILSI. Just to reiterate, ILSI is an international scientific foundation with HQ in Washington DC having focus on nutrition, food safety, biotechnology, environment and risk assessment. ILSI has 16 regional branches the world over apart from the Health and Environment Sciences Institute. ILSI Research Foundation along with CERA and the Centre for Integrated Modelling of Sustainable Agriculture and Nutrition Security or CIMSANS undertake and support research with the final objective of using science for promoting human health and wellbeing. ILSI has consultative status with FAO and NGO status with WHO. ILSI-India which represents South Asian Region has similar objectives and works closely with Government, Academia and Industry. This tripartite approach has made science an efficient tool to conceive, shape and implement measures to enhance the wellbeing of the people.

ILSI-India has been taking great interest in agricultural biotechnology since 1996 when we had the first conference on GMOs. That conference became a precursor to setting up an effective regulatory system in the country. Since then we had several conferences and training programs to encourage and facilitate use of biotechnology in agriculture with emphasis on food, feed and environmental safety.

In the past ten years, new generation technologies have emerged. Several plant breeding technologies have been developed which make it possible to precisely perform genome modification in plants. NPBTs do not necessarily involve transfer of entire gene from one organism to another. These groups of technologies vary in both techniques deployed and their impact on heritable change in plant genome.

The emerging New Plant Breeding Technologies have good potential for developing new crop varieties and extensive use by plant breeders world-wide. This development has taken place mainly in Europe and the US though regulatory procedures for safety assessment are yet to be in place. This year alone there have been workshops and conferences on NPBTs in Australia, Germany, Austria and so on to discuss whether and how NPBTs are different from transgenics and consequently what should be the system of regulation.

This is the first conference on NPBT to be held in India. The participation in this Conference is by invitation and consists mainly of policy makers, premier institutions engaged in agricultural research and select plant breeders.

It is critical for India that food production increases as rapidly possible. The Green Revolution initiated by Dr Norman Borlaug in the early 1970's led to a rapid increase in productivity and changed the status of India from a net importer of food grains to a net exporter of food grains. The increase in production from 84 mt to 208 mt was brought about almost entirely from improvement in yield. In the last 40 years, yield per hectare of food grains was up from 872 kg to 2095 kg. It is necessary that improvement in productivity is maintained so that production catches up with demand, considering that population is increasing, no new land can be brought under cultivation and no new sources of water will be available. Hence the need for new technologies which are attractive to the breeders and acceptable to the people.

The hybrid seeds technology which served us well has now to be replaced. Genetically modified crops have been effectively used by some of the countries mainly for herbicide tolerance and insect resistance. But GMOs have not found acceptance in India in respect of food products. No doubt this technology has been extensively used in cotton and

produced wholesome results. We are now the second largest producer of cotton. The only GM food product that was approved by the regulatory authorities was Bt brinjal. But it was not acceptable to the NGOs who claim to be the conscience keepers of the general public. Legal intervention was sought and the matter is now awaiting judgment from the Supreme Court.

Apart from public resistance, the genetically modified products take a much longer time to establish their safety to human and animal health as also the environment. For instance, in India, the GM product has to be approved by RCGM in the Department of Biotechnology which after intense scrutiny recommends it to the GEAC in the Ministry of Environment and Forests for final approval. Commercialization of Bt. cotton took seven years and more than 500 tests. Bt brinjal, similarly took as much time and a number of extensive and expensive studies. The approval process takes too long and costs too much.

The NPBT have technical advantages over GMOs and have shown good results. Herbicide tolerance in rape seed and maize, fungal resistance in potatoes, drought resistance in maize, scab resistance in apples and potatoes have been proven with the use of NPBTs. The future of these technologies however depends on the decision on how the resulting products have to be regulated.

Extensive studies have been made, for instance, by working groups set up by European Commission and FSANZ. But the scope of regulation is still not well defined. NPBTs do not necessarily involve transfer of entire genes from one organism to another. There is a view that NPBTs should be evaluated concerning the new traits and the resulting new products instead of the technique used to create the new variety. Therefore NPBTs may not fully qualify as GM and some of the technologies may be exempt from regulation and some others subject to regulation which is simple and takes much less time. Perhaps different approaches will have to be adopted for different technologies.

NPBTs can have three distinct advantages:

First, the final product does not contain genes that are foreign to species unlike in GMOs and will therefore be acceptable to the public

Second, the time taken to develop the new products with NPBT will be much less than the time taken by conventional breeding. This will enable considerable saving in costs.

Third, the regulatory approval procedures if simplified or eliminated will also reduce time and cost to the breeders pre-commercialization.

Like any other technology, it is the economic advantage of NPBTs that will accelerate their use. Further, it is necessary that there should be a common regulatory approach by all countries. Different regulations by different countries will result in trade disruption and lead to lop sided development of the new technologies. This Conference, I hope, will bring about some convergence in the outlook for NPBTs and be the beginning of the next phase in policy making in India and possibly other countries. If the regulation facilitates adoption of these technologies the commercial adoption of these technologies will be fast and wide and promote rapid agricultural development.

This Conference will be in two parts. Today we will be discussing the technical aspects of NPBTs which will reveal how close some of the technologies are to GM and how close they are to traditional plant breeding. Tomorrow we will be discussing the regulatory systems in major countries.

NPBTs are of great interest to India because of the public resistance to GM. I hope the plant breeders in India will look at these technologies closely and the Government will facilitate their adoption to develop new products. For India the immediate need is to improve productivity and enrich the nutrition content of food grains, fruits and vegetables.

I welcome you once again and look forward to the presentations, discussions and outcome.