

Minutes of the second Meeting of Industry Platform on Agri Biotechnology
held at Hyderabad from April 9 -10, 2009

1.0 In the first meeting of Agri Biotech Industry Platform held at Hyderabad on January 9, 2009, a decision was taken to constitute four inter-disciplinary Working Groups viz. infrastructure, abiotic stress, biotic stress and seed production. The terms of reference and composition of these four Working Groups was also decided in the meeting. It was decided that each Group will prepare a Strategic Research Planning paper for in depth discussion in the next meeting. In the second meeting, the deliberations were made on the Strategic Research Plan of the four Working Groups. The details are as below:-

2.0 Infrastructure

- Development of a centrally administered, internationally accredited facility(s) to evaluate transgenic crop products including biosafety assessment and field status as a single window for both public and private research establishments.
- A screening facility to identify agronomically useful molecules.
- Phenotypic evaluation facilities located in relevant agro-ecological zones for product testing.
- A national facility for immunological diagnosis of diseases proposed by the Group on Biotic Stress
- Hi-tech analytical lab for doing routine analysis of Molecular Markers including SNPS and chemical analysis in the screening facility.

2.1 The suggested model for operationalising these facilities was:

- Testing process to be fee-based and time-bound.
- Adherence to prevailing national and international regulatory standards.
- Maintenance of confidentiality.
- An autonomous organization managed on corporate lines.
- Private players to play active role in the governance of the facilities

2.2 It was suggested to prioritise facilities in accordance with the need. For this it was necessary to take into account the existing facilities already available and their shortcomings. DBT would facilitate in compilation of such information along with a techno feasibility study for the creation and running of the facilities on self sustainable basis.

2.3 It was also suggested that the facilities / infrastructure being suggested should meet national and international biosafety and regulatory requirements.

3.0 Abiotic Stress

The following priority was identified for traits of abiotic stress and target crops groups:

- Drought Tolerance– Rice, Corn, Cotton, Hot Pepper, Tomato and Mustard
- High and low temperature tolerance– Wheat, Rice, Tomato

- Salinity – Rice and Okra
- Submergence Tolerance – Rice , Corn, Soyabean
- Heavy metal toxicity (Cd, Al, Se)-Rice, Corn, Vegetables

3.1 As some organizations are already working on salinity and submergence tolerance in rice, it was felt that these areas would not be looked at by this Group.

3.2 Based on the constraints, the Group proposed the following:

- Develop mechanism to license traits/ genes/ technologies from different global sources and make them available to collaborative partners for the crop improvement programmes.
- Establishment of Centralized High Precision Phenotyping facility for Abiotic Stresses.
- Establishment of High Throughput new generation marker/ genotyping facility.
- Centralized facility for biosafety studies for transgenic crops.
- Formulation of specific projects with defined products and time frame using public private partnership in a network mode.
- Common repository of genes/transgenic events/promoters/ marker/genes linked to trait, candidate gene sequences, and other materials with clear contracts on IPR issues.
- HR development (e.g. training in innovative breeding) and easy access to important journals.

4.0 Biotic Stress

The following crops with associated biotic stress were prioritized:

- Maize: *Turicum* blight & DM
- Sorghum: shoot fly
- Pigeon pea & chick pea: *Fusarium* wilt
- Sunflower: stem bud necrosis
- Mustard: Powdery Mildew & *Alternaria*
- Groundnut: Aflatoxins & GBNV
- Muskmelon: PM/DM/ Anthracnose

- Rice: Sheath blight
- Wheat: Rust
- Tomato: TLCV and TOSPO Virus
- Chilli: Potyvirus & Anthracnose
- Okra: YVMV/ELCV
- Watermelon: WBNV

4.1 The group suggested considering Pulses and Oilseeds particularly chickenpea for diseases.

4.2 The Group suggested the following requirements enhancing the industry productivity:

- High throughput genotyping facility to carryout marker genotyping
- Facility for characterization & validation of genes in public institutes for the biotic stress
- Network comprising both public and private organization for developing biotech crops
- Central facility for evaluation of biotech crops such as validation of event & biosafety studies
- Availability of characterized & validated genes

4.3 The concept of immuno-farm was explored and a diagnostic facility was suggested to be created for disease surveillance and to close gap between immunology experts and agriculture experts. Need was also felt for production of antibodies for specific diseases, diagnostics and confirmation in the referral lab. This would need further discussion.

5.0 Seed Production

Priorities identified for research :

Cereals	: Rice, Corn
Milletes	: Sorghum, Bajra
Pulses	: Pigeon Pea
Oil seeds	: Musturd, Sunflower
Fiber Crop	: Cotton

5.1 The constraints in development of quality seeds were identified as below:

- I. Lack of pure quality parental lines
- II. Lack of public private linkage in research and commercialization
- III. lack of diverse germplasm

5.2 The proposed projects were:

- Seed Production Research
 - Synchronization of parents
 - Optimizing yield potential
 - Plant population studies
 - status on reproductive biology including for enhancement duration of pollen viability and receptivity of stigma
- Standardization of seed quality enhancement techniques
 - Seed treatment
 - Seed coating & pelleting
 - Seed priming etc.

- Diversification of CMS/R lines
- Identification and standardization of molecular markers for purity testing
- Marker assisted selections

6.0 Policy Initiatives

Silicon should be included as an essential nutrient for Rice. The proposed Seed Act required indepth studies to see if GOT is the only test for purity, if so then FICCI should submit a representation to DBT and the Ministry of Agriculture on behalf of industry with detailed analysis of likely problems to Industry.

7.0 Other item

The members emphasized the need for access to technical articles and journals, and it was agreed that DBT would work out details for e-distribution to the agribiotech industry platform members. Relevant journals and technical articles to be submitted through FICCI to DBT.

8.0 Recommendations and Action points

8.1 Preparation of Strategic Research Plan

Each Group to work on detailing the Strategic Research Plan based on the following framework:

- Existing Technologies : Proven at both national and international levels
- Potential of the sector to include type and extent of Government support required
- Information Exchange between members of the Platform
- Infrastructure requirements including technology validation mechanism
- Grand Mission – Bringing long term perspective for the sector

8.2 The final draft may be prepared latest by May 15, 2009 for circulation to all members through email by FICCI.

8.3 DBT will organize a brain storming session at New Delhi in the last week of May 2009 for which Chairman and one member from each Working Group will be invited for detailed discussion on the SRP and prospective project proposals. Experts from the relevant research institutions as identified by the Industry shall also be invited.