



**United Nations Framework Convention on Climate Change**  
**Workshop on Strengthening national systems of innovation**  
**in developing countries, 13-14 October 2014, Bonn**



**BIOSEED**

Bioseed experience in receiving and absorbing technology

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- Bioseed profile
- Impact of Climate Change in Bioseed context
- Technology access to develop Climate Resilient hybrids
- Key learnings / success factors

# About Bioseed

- Bioseed is the hybrid Seed business of DCM Shriram Ltd.
- Focus on Tropical and Sub-Tropical climates in S & SE Asia
  - Companies in India, Vietnam, Philippines, Thailand, Indonesia
  - Serving peripheral markets - Bangladesh, Nepal, Laos and Cambodia
- Mandate crops
  - Field Crops-Cotton, Corn, Rice , Millet, Pigeon Pea, Mustard
  - Vegetable Crops- Okra, Tomato, Gourds, Melons, Hot Pepper, Egg plant



# About Bioseed

- Strong in-house research programs in plant breeding and biotechnology – both GM and non-GM
- Strong customer focus - create economic value for farmers
- Invest 10-12% of our revenue in R&D – more than half of it is in biotechnology
- Strategic alliances to access / co-develop new technologies





# About Bioseed

- Strong production capacity with stringent QA protocols
- Strong and reliable distribution network
- Partner with Govt. to make seed available to poorest of poor farmers
- Focus on delivering comprehensive agronomy solutions



# Impact of Climate Change

- Increased occurrence of extreme weather conditions
  - Drought, Salinity, Excess rainfall, High/Low temperatures
- Increased nutrient stress
- Erratic weather (rainfall and temperature) patterns
- Unpredictable incidence of biotic stresses – diseases, sucking insect pests, etc.

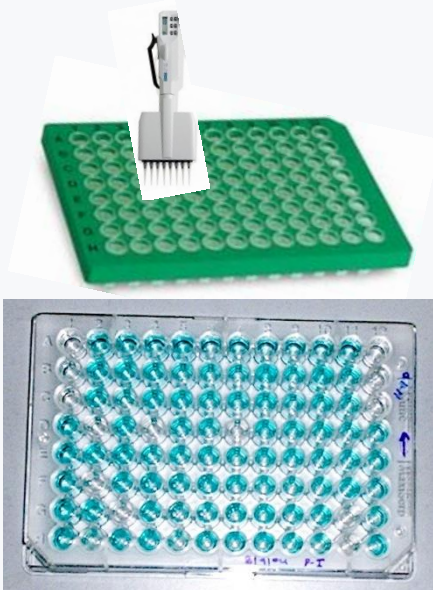
*India 2014: Severe drought in most parts, followed by excessive rain fall in some parts, 3-5°C above normal temperatures, increased incidence of sucking pests; 10-15% shortfall in production projected*

# Development of climate resilient hybrids

- Accessing / co-developing / developing GM as well as non-GM technologies
- Technology access from both private & public sector and national & international organizations
  - Drought and salinity tolerance
  - High nitrogen use efficiency
  - High temperature stress tolerance
  - Disease resistance
  - Sucking pest tolerance
- Challenge is to combine all these with high yield potential

# Technology access

- Access of ready-to-use technologies
  - Insect resistance – BG cotton in India, YGRR corn in Philippines
- *Needed to create only diagnostic support capability*



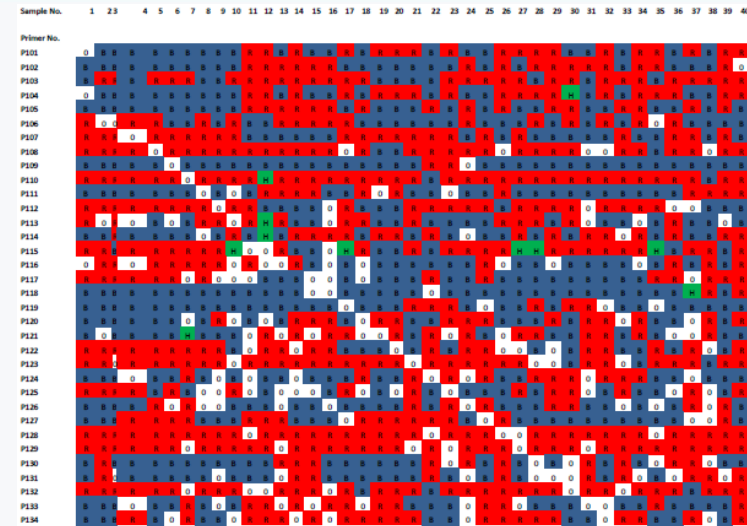


# Technology access

- Collaboration to co-develop technologies and licensing-in of technology leads for further development
  - GM technologies
    - Abiotic – Drought & salinity tolerance, NUE
    - Biotic - Insect resistance (both chewing and sucking pests)
  - Non-GM technologies
    - Abiotic – Drought & salinity tolerance
    - Biotic - Disease resistance, Sucking pest tolerance
    - Long shelf life of vegetables
    - High yield
- Licensing-in of enabling technologies
- *Needed to create **absorptive capacity***

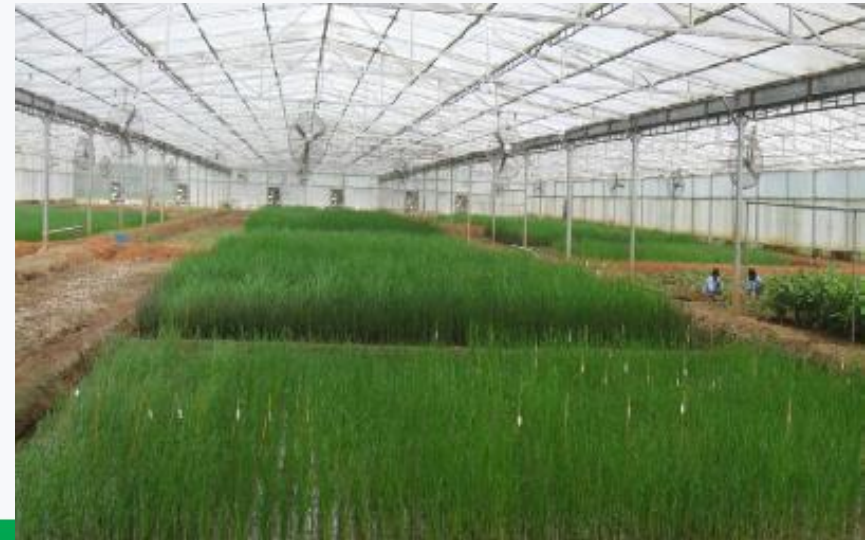
# Creating absorptive capacity

- Infrastructure
  - Drought and salinity phenotyping
  - High throughput genotyping
  - Bio-informatic capability



# Creating absorptive capacity

- Infrastructure
  - Enhanced molecular biology capability
  - High throughput genetic transformation
  - Containment facility for GM work
  - Insect bio-assay capability



# Creating absorptive capacity

- Human capital
  - Additional resources (specialists)
  - Continuous enhancement of skills through training
- Regulatory and stewardship capability
- Active engagement with policy makers
- IP management capability
- Enhancement of breeders' skills to ensure integration of biotechnology with conventional breeding for seamless use of biotechnology in product development
- Capability to carry out downstream / application research



# Key learnings / success factors

- Clearly defined technology needs and alignment with our vision and product development strategy
- Willingness and commitment to invest in development of absorptive capacity
  - Downstream technology development for use in product development can only be done locally
    - Technology must be delivered through seed
    - Most countries require biosafety evaluation to be done locally
- Mutual trust between collaborating partners
  - Alignment on IPR & stewardship issues, transparency, credibility, ability for commercial exploitation, etc.



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**THANK YOU**

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