

Providing tools for molecular breeding and research

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Tissue samples/DNA

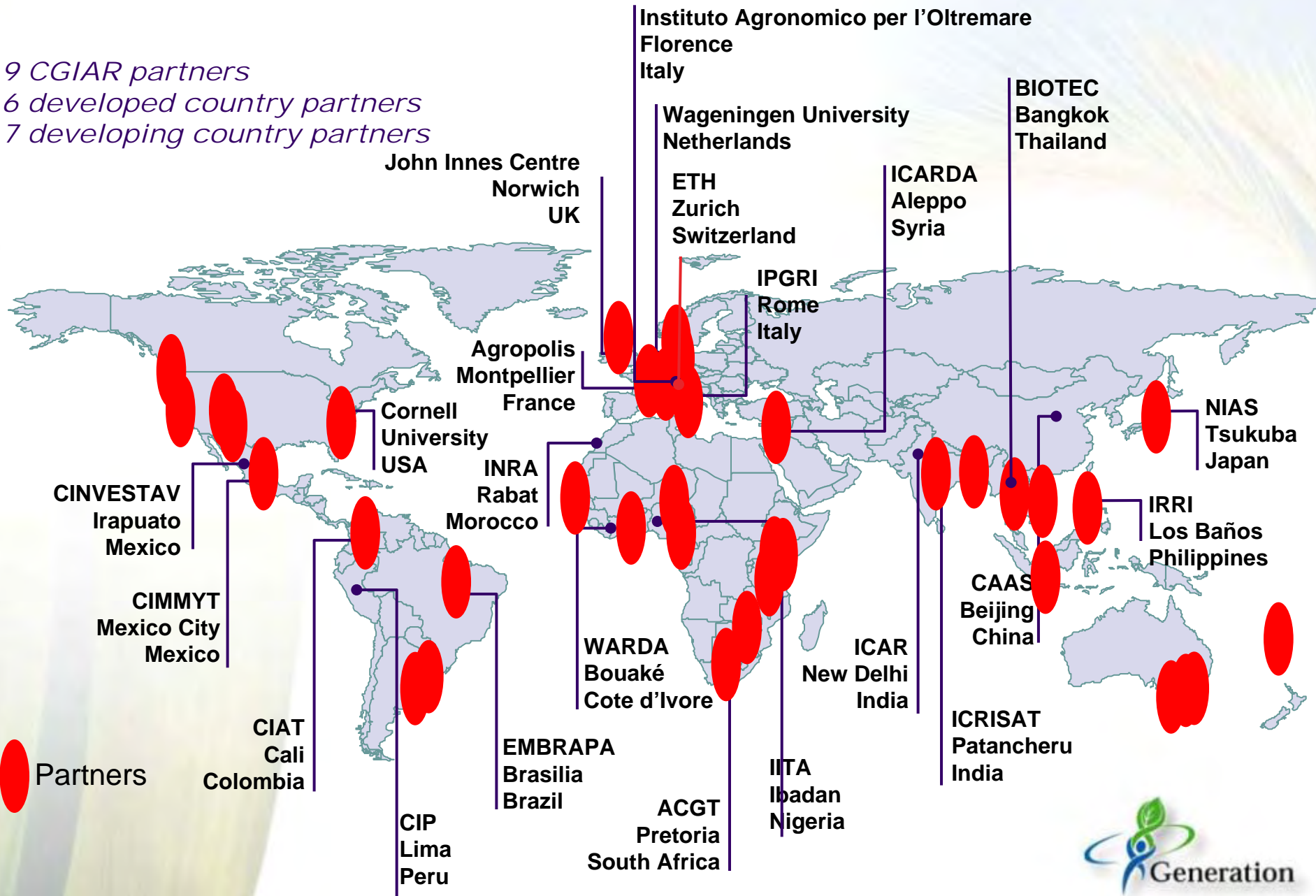
Breeding &
Research
Programs

Marker
Service
Lab

Data/Results

GENERATION Challenge Program

9 CGIAR partners
6 developed country partners
7 developing country partners



Partners



The Molecular Breeding Platform Partnership

USERS

TOOLS AND SERVICES

PARTNERS

CGIAR Pre-Breeding & Breeding Projects

CGIAR Breeding Networks

NARES Breeding Projects

Small & Medium Sized Enterprises

Genetic Resource Support Service

Breeding Logistics & Data Management

Marker & Trait Services

Analysis Pipeline

Decision Support Tools

Training & Capacity Development

Accumulated Crop Information for Predictive Breeding

CGIAR Lead Crop Centers:

- Set breeding standards and procedures
- Help train external users
- Curate and Host Public Crop Information
- Promote use and access to the Platform

Use Case Projects:

- Specify requirements
- Test tools and services
- Ensure Relevance
- Promote use of and access to the Platform

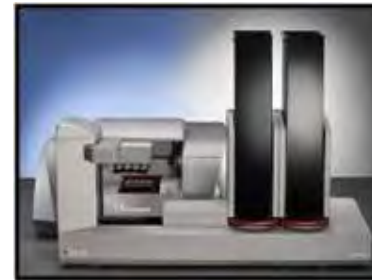
M.S. Swaminathan Applied Genomics Laboratory

Genotyping Service Laboratory

- **High-throughput DNA extraction**
- **Robotic PCR setup**
- **768 well PCR**
- **ABI 3730xl (SSR)**
- **Li-Cor (AFLP and TILLING etc)**
- **DArT (chip-based marker analysis)**
- **Capacity to generate ~1 million data points per annum**

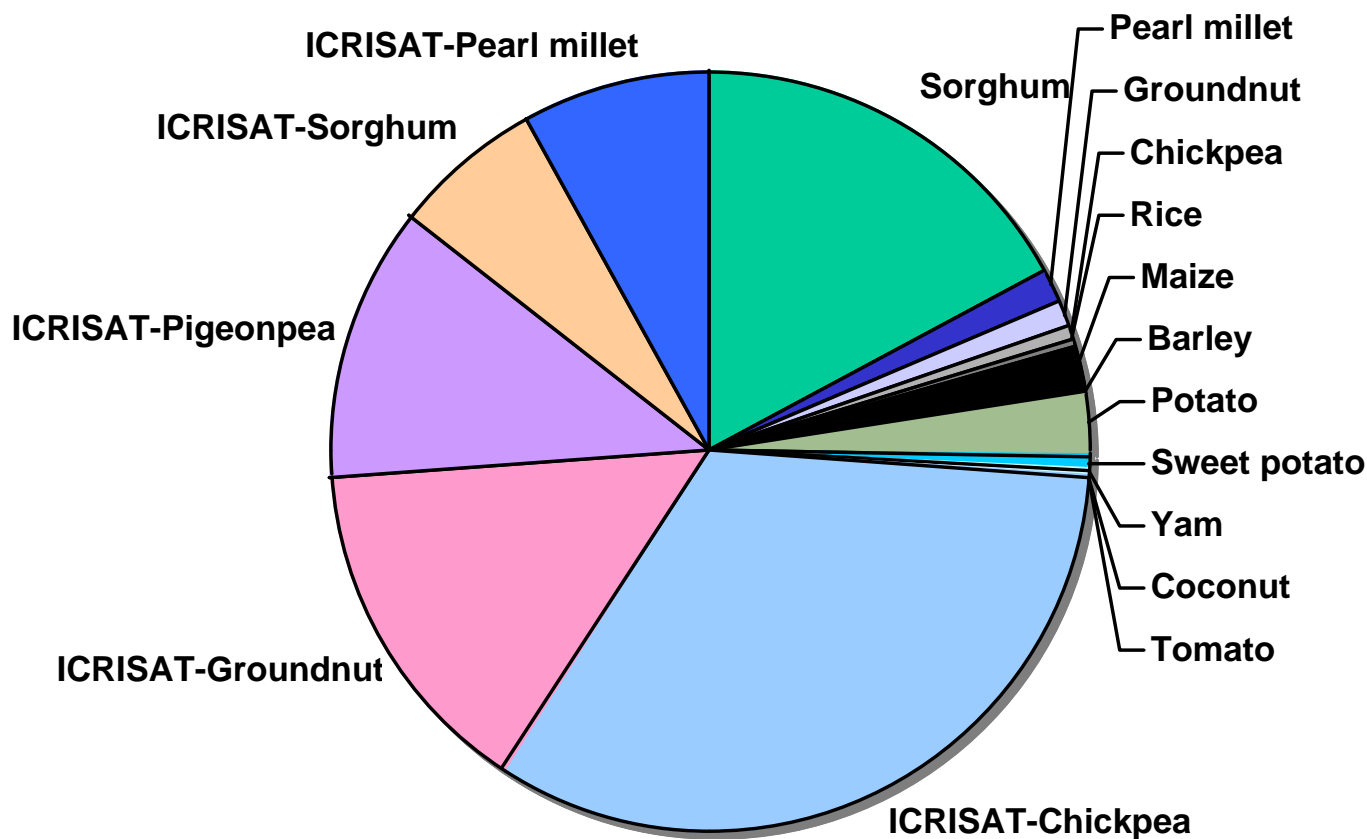
Bioinformatics and Biometrics

- **Laboratory Information Management Systems (LIMS)**
- **ICRISAT Crop Resources Information System (ICRIS)**
- **Data analysis**
 - **iMAS (pipeline of common softwares)**
 - **ISMAB (visual plug-ins for use by breeders)**



GSL Datapoints Generated

2008 - 2009



GSL Training Opportunities

2008 - 2009

Type of organization	First Training (17- 28 Mar 2008)	Second Training (31 Mar-11 Apr2008)	Third Training (6-24 Oct 2008)	Fourth Training (17-28 Nov 2008)	Fifth Training (18- 29 May 2009)	Sixth Training (16-27 Nov 2009)	Totals
ICAR & CSIR Centers	8	7	6	5	9	9	44
State Agricultural Universities/ Universities	4	9	7	10	5	8	43
Regional Agricultural Research Stations	4	1	9			1	15
Private Sector SMEs/Research Foundations		1		4	4	2	11
Government Organizations/ Institutes				2	4	1	7
Overseas		2		5	3	7	17
Totals	16	20	22	26	25	28	137
						Male	98
						Female	39

Biosciences eastern and central Africa (Beca)

Hub for Molecular Breeding

- Being developed under framework of “Centres of Excellence for Science and Technology” (7 labs ~ 6000 m² from BSL-I to BSL-III)
- Aims to employ modern biotechnology to improve agriculture in eastern and central Africa
- Crops, livestock and microbial biotechnologies



BecA-Net Countries



BecA-Net countries

Burundi, **Cameroon***, Central Africa Republic, Congo Brazzaville, Democratic Republic of Congo, Equatorial Guinea, Eritrea, **Ethiopia***, Gabon, Kenya, Madagascar, **Rwanda***, São Tomé and Príncipe, Somalia, Sudan, **Tanzania***, **Uganda***

(*Node countries)

Legend:

- BecA's ASARECA* Member States
- BecA's Non-ASARECA* Member States

*Association for Strengthening Agricultural Research in Eastern and Central Africa

Core competencies at BecA-ILRI Hub

- **Bioinformatics**
- **Diagnostics (nucleotide- and protein-based)**
- **DNA sequencing (ABI, 454)**
- **Genetic engineering**
- **Genomics/Genetics**
- **RNA silencing/RNAi**
- **Molecular breeding (marker development/applications)**
- **Proteomics**
- **Vaccine technology/immunology**
- **Vectors (e.g. ticks)**



Critical mass of scientists

- 33 core scientific and technical support staff of BecA Hub
- 18 scientists and technical staff from 4 CGIAR crop centers (CIP, CIMMYT, IITA, ICRISAT)
- 45 scientists and technical staff from ILRI's Biotech Theme
- A number of affiliated prominent scientists located globally (e.g. Cornell University, Washington State University, Kenyatta University, University of Uppsala, etc)

Capacity building at the Hub

Since 2007

81 Graduate students/short-term trainees

19 Visiting scientists

Training courses/workshops since 2007

650 Group training workshop/conference participants

16 training workshops (80% in molecular breeding and bioinformatics)

4 workshops/conferences



Current status: Research & research services

- 29 major crop research projects (cassava, maize, sorghum, etc.)
- 20 major livestock-related projects
- 600% increase in DNA sequencing, genotyping volume in the last 2.5 years

MBP & Regional Service Labs - Adding Value to Crop Research

- Access to state-of-the-art Molecular Breeding tools and services to enhance breeding efficiency
- Standardized and integrated Crop Information management for developing countries
- Enhanced capacity for developing country partners
- Share and optimize development and maintenance costs
- Entry for developing countries to molecular breeding eased
- Shared capacity building
- Enhanced efficiency for SMEs
- Access to accumulated Crop Information
- Promote communities of breeders using molecular tools

Thank you!

