

Excellence in Breeding Platform

Michael Quinn, EiB Lead

The objective

Accelerate & increase rates of genetic gain by breeding programs for the developing world

Vision of success

Crop and animal breeding programs are delivering high rates of productivity gain to farmers in the developing world through genetically improved cultivars and breeds that are resilient, nutritious, and desired by the market.



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The EiB approach

- **How?** Working with breeders to define best practice and which tools and services would increase rate of genetic gain per dollar invested. Then, enabling this to be implemented!
- Four regional hubs: West Africa, South/Sub-Saharan Africa, South Asia, and, Latin America.
- **From where?** EiB, CGIAR, ARIs, private sector
- **Benefit to:** Public and private sector breeding programs targeting low- and middle-income countries



Five focus areas = Modules

Module 1

Breeding program management

Module 2

Optimizing breeding schemes

Module 3

Genotyping / sequencing
tools and services

Module 4

Phenotyping tools and services

Module 5

Bioinformatics, biometry and data management
tools and services

**Creating
synergies to
accelerate
genetic gains of
breeding
programs
targeting the
developing
world**

The Toolbox

Areas of focus

Breeding program management	Breeding program optimization	Genotyping	Phenotyping	Bioinformatics
Gender and market responsive product profiles	Use of predictive tools; phenotypic or genomic	Use cases for MAS, GS and QC inc. trait pipelines	GxExM & Targeting	Landscape analysis & strategy
Stage-gate process	Integrating trait breeding with core breeding	Cost-benefit analyses	High throughput phenotyping inc. indirect selection	Software
Genetic gains assessment	Optimizing breeding programs		Cost benefit analyses	Data standards
Breeding program assessments			Automation & Mechanization	Biometrics
Access to mentors	Access to mentors	Access to service providers	Access to service providers	Access to service providers

Best practices and training modules in the Toolbox (QA)

Toolbox

- Online knowledge interface to access resources provided across modules 1 to 5
- For communication, documentation of know-how, access to training and to service providers, and, of any outputs that can be shared electronically (i.e. software)
- For Members, Contributors and Users



With whom EiB will interact...

- Members
- Contributors
- Users



With whom EiB will interact...

Members (Beneficiaries)

- Sign membership agreement, describing commitment to work with the EiB
- Agreement is signed by breeding teams and their managers.
- Available (for free) to all CGIAR breeding programs and (initially) 4 selected pilot NARS. Additional availability on a cost recovery basis.
- Members to commit to breeding program improvement plan.
- Will receive full EiB support to implement breeding program improvements.
- Full access to the toolbox, including restricted member sites.
- Potential to include over 100 individual programs.
- Decentralized training strategy focused around four regional hubs in South Asia, E&S Africa, W Africa, Latin America.



Membership agreement

What is a breeding team?

- Breeder(s) and breeding support scientists consistently working together on a species-by-target environment combination
- A breeding team will; make crosses, develop and test new lines.
- A distinct breeding team will; have distinct objectives (perhaps target environment) or species (durum wheat vs bread wheat).
- Team leader will be key contact for EiB to understand needs and follow up with for implementation



Initial members

- 4-5 pilot NARS
- Africa Rice
- CIAT
- CIMMYT
- CIP
- IITA
- ICARDA
- ICRAF
- ICRISAT
- ILRI
- IRRI
- WorldFish

Initial target:

- 60 – 100 breeding teams in Asia, Africa, Latin America
- Reached via four training hubs

In future: more members possible

- Self funded
- Third party funded



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With whom EiB will interact...

Contributors

- Anyone contributing to achieving breeding program improvements through EiB, by providing tools, best practices, services, training etc.
- EiB will lead the dissemination of these tools and best practices across the system
- Will come from EiB staff, CGIAR, Private sector, ARI's....
- Can register through the toolbox.
- Interaction with members will occur through workshops (personal and virtual), individual one on one mentoring / consultation and through the toolbox.
- Focus is on enabling members to implement the seven main ambitions.



Key contributors

- CGIAR centers
- Cornell University
- Diversity Array
- Du Pont/Pioneer
- IBP
- Monsanto
- Queensland University



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EiB Past 12 months

- CGIAR breeding center visits by Marianne Banziger and Michael Quinn; to gain first hand insights into opportunities, challenges, and sources of excellence.
- Development and distribution of membership agreement.
- Development of templates for capturing status of breeding programs.
- Surveys executed and summarized.
- Workshops and Hackathons.
- Toolbox is now live!

New Positions

- Module 1 leader – George Kotch (Full time!)
- Module 2 leader – Very strong candidates in final stages of selection process
- NARS Coordinator- Very solid applications received
- Automation and mechanization specialist - Very solid applications received
- Product manager / Market researcher – Applications still being received



Outcomes expected from this week

For each of the areas of focus:

- What are the changes we're wanting to enable. What is best practice? What are the highest priorities?
- What training, mentorship (skills and know how), tools or services need to be made available and utilised/implemented to achieve the above objectives?
- Where are we currently at in terms of development of above training, tools and services?
- If further development is required, what is the plan (and schedule) for development?
- For all training, tools and services, what is the plan for delivery to breeding teams? Including location and schedule.

EiB objective & approach

- **Objective:** Accelerate & increase rates of genetic gain by breeding programs for the developing world
- **Approach:** Working with breeders to define best practice and which tools and services would increase rate of genetic gain per dollar invested. Then, enabling the above!
- **Let's go!** I hope you're all as excited about this opportunity as I am. Let's get started!



Suggestions?

Questions?

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