Excellence in Breeding PLATFORM

How to work with and benefit from the Excellence in Breeding Platform

2017

Specifications and FAQs for potential **members, contributors, users and funders** of the **CGIAR Excellence in Breeding Platform.**

CGIAR | Excellence in Breeding Platform

Tools and services that create synergies and accelerate genetic gains of breeding programs targeting the developing world

How to work with and benefit from the Excellence in Breeding Platform

The CGIAR Excellence in Breeding Platform (EiB) works with, and creates benefits for four different stakeholder groups. These groups are classified according to the level and mode of engagement with EiB:

1. **Members:** Breeding teams that commit to work with EiB to optimize breeding program performance. These clients obtain priority access to platform resources, including applied breeding tools, practices, services and advice.
2. **Contributors** of applied breeding tools, practices, services and advice that optimize breeding program performance. These clients obtain harmonized access to a broad community of breeders and researchers who are able to use, review and provide helpful feedback on application of particular client resources within their own breeding and research applications.
3. Other **Users** that are able to access Platform know-how from its public website (toolbox).
4. **Funders,** who may access information such as breeding program targets, successes and bottlenecks of breeding programs serving farmers in the developing world on an increasingly transparent basis due to EiB efforts.

Details of how these groups will interact with EiB are outlined below.

Members

Members are the *distinct* breeding teams with whom EiB works to augment breeding program performance, and are therefore the primary beneficiaries of EiB. A breeding team includes the primary breeder plus phenotypers, molecular breeders, geneticists, biometricians, pathologists, physiologists, quality specialists, breeding team management and other disciplinary specialists consistently working together on (a) species-by-target environment combination(s) and responsible for breeding program outputs.

Members can expect from EiB:

1. Collaboration that systematically analyzes and achieves best breeding practices in alignment with the following main ambitions (core areas of focus):
    1. Clear product profiles;
    2. A stage gate process “from breeding cross to farm”;
    3. Optimized breeding schemes;
    4. Effective and routine assessments of genetic gains;
    5. Access to lower-cost, application-targeted genotyping;
    6. Access to lower-cost, application-targeted phenotyping;
    7. Bioinformatics and biometric tools supporting improved design, analysis, automation, data integration and decision making.

2. One-to-one mentorship and participation in focused regional workshops where best practices are exchanged and further developed.
3. Training tools to assist breeding programs in scaling up successes internally and with partners.
4. Pilot access to prioritized tools and services, in particular to lower-cost genotyping and mechanization/automation options and software developed, funded or co-funded by CGIAR-affiliated projects (e.g., BMS, B4R, GOBII, CassavaBase, etc.).
5. Complete access to all areas of the online toolbox hosted by the Platform. Includes access to discussion forums allowing members to discuss topics of common interest and share program details in a members-only environment.
6. Influence on the EiB agenda and investments.
7. Inclusion in investment proposals targeted at funding agencies to strengthen the impact of breeding programs targeting the developing world.

By systematically focusing on best breeding practices aligned with the seven ambitions listed above, members will achieve higher rates of genetic gain for their time and resource investment. At any given level of resources, EiB seeks to enable members to achieve greater efficiency and effectiveness in reaching farmers in the developing world with more successful cultivars and breeds. Members will be better placed to attract funding by providing confidence to funders of maximum return on investment, as a result of providing greater transparency on breeding program targets and progress, and the implementation of best practices.

Membership can either be sponsored by EiB or self-funded. Sponsorship is available (at no cost) to all CGIAR breeding teams and initially to breeding teams from four pilot national agricultural research system (NARS) institutions. As EiB resources expand, it will open sponsored membership to additional NARS. Preference is given to sponsoring NARS from low and lower middle-income countries. Self-sponsorship by NARS (in upper middle- and high-income countries), universities with breeding programs or private sector users who are interested in becoming members is encouraged, subject to EiB capacity.

Requirements to become a member:

Membership requires breeding teams as well as their senior management (Director General, Deputy Director General or equivalent) to decide they want to become a member and to sign a membership agreement.

To obtain and maintain membership requires:

1. A demonstrable commitment to the implementation of a breeding program improvement process aligned with best practices identified by EiB and commensurate to resources available.
2. Provision of standardized information about product profiles, stage gate implementation, genetic gains assessment, breeding schemes, genomics, phenotyping and bioinformatics tools used, and updating of such information as the breeding program proceeds with the improvement process.
3. Provision of review outcomes and responses to the Breeding Program Assessment Tool (BPAT) (when completed).

4. Active participation in EiB communities of practice, training workshops and mentorship programs, including through suggestions and feedback on best practices and improvement approaches.

Contributors

Contributors are any individuals or organizations that contribute in any way to applied breeding tools, best practices, equipment, genotyping or other laboratory services, biometrics services, software, training or mentorship, promoted through the EiB web-based toolbox or that otherwise support members' ambitions for change. They could be from within CGIAR, NARS, EiB, the private sector or advanced research institutes, or be independent consultants. Contributors will need to register through the web-based toolbox. They will have broad access to the toolbox and discussion forums. Contributors may be either individuals or organizations that donate their skills/expertise/knowledge, or that receive funding to implement prioritized EiB interventions.

Users

Users will benefit from accessing the public domain of the toolbox, which will include information about applied breeding tools, best practices, information about equipment, genotyping or other laboratory services, biometrics services and software.

Frequently asked questions

Q1. I am a member and am interested in some components offered by the EiB (such as having better targeted genotypic and phenotypic data) but am not interested in other components (such as addressing the breeding scheme, developing product profiles or implementing a stage gate process). How can I do this?

A1. Systematically establishing and discussing best practices among members will allow individual members to identify gaps and new ambitions, or identify where they are indeed among the leaders in implementing best practices. The Platform will rely and capitalize on the give-and-take of all members and work in a collaborative manner.

Q2. What is the purpose of providing standardized information about product profiles, stage gate implementation, genetic gains assessment, breeding schemes, genomics, phenotyping and bioinformatics tools used?

A2. This serves a number of purposes. Firstly, to establish a benchmark from which future improvements can be made. Secondly, through the community of practice, other members will be able to learn from one another and will be exposed to novel ways of operating as this information is shared between members. Thirdly, this information will help EiB to identify how the Platform may best serve any given member. Finally, it is also an important input to joint funding proposals to bring greater resources to member teams.

Q3. Why is it important to provide feedback to EiB in regard to impediments to implementing any components of the breeding program improvement process?

A3. Best practices are rarely developed through the experience or wisdom of any one person, but are often the result of collaborative feedback and troubleshooting efforts. Issues and bottlenecks encountered by one team are likely to be encountered by others; the shared learning from analysis of "mistakes" provides an invaluable opportunity for the breeding community to implement interventions in a timely manner. Tackling bottlenecks together will allow us to arrive at better solutions in a faster and more effective manner; mistakes are only mistakes if we cannot dissect them and implement positive change in response.

Q4. I am already routinely assessing rates of genetic gain and it is working extremely well. Will I need to modify what I am already doing?

A4. In the course of working with other members, you may discover the benefits and drawbacks of your approach. As a result, you may want to implement changes or otherwise act as "a leader in the field" from whom the broader community can learn. EiB capitalizes on the joint definition of best practices that individual breeding teams would want to implement in their own endeavor to strive toward excellence.

Q5. Genotyping is a core component of EiB. The program I manage is very small with a small budget. There are also no (or limited) useful marker trait linked associations currently identified. Will I need to implement markers into the program to remain a member?

A5. EiB works with you to optimize your breeding program at any given level of resources. If the cost-benefit analysis does not support the use of markers, then the best practice for this component is to not use markers in the program. The same logic applies to all the core components. The consideration and addressing of each core area of focus does not necessarily imply that changes in that area are needed.

Q6. I am using a database to assist breeding data management that is not supported by EiB. Will I need to change?

A6. Provided the database you are using is sufficient for your needs you will not need to change. We want members and users to adopt systems according to their own individual benefit. Principally, EiB will invest in developing specific bioinformatics tools and functionalities that are most in-demand by members. In addition, EiB supports the development of an interface (a breeding application programming interface, BrAPI) that allows bioinformatics tools to be made intercompatible. By becoming BrAPI-compatible, systems that are not directly supported by EiB can be of enhanced utility.

Q7. What resources can EiB provide to achieve changes in any of the areas of focus?

A7. EiB will provide access to targeted training, workshops, consultation and mentoring for members. Through EiB, members will benefit from greater access to better software that is developed, funded or co-funded by CGIAR-affiliated projects (e.g., BMS, B4R, GOBII, Cassava Base, etc.). EiB will provide pilot access to prioritized tools and services, in particular to lower-cost genotyping and mechanization/automation options. EiB aims to provide access to lower-cost consumables (e.g., chemicals, marker plates, etc.), services (e.g., genotyping, phenotyping, near infrared reflectance spectroscopy, chemical composition analysis, etc.), machinery and equipment by brokering deals and utilizing economies of scale across member breeding programs. The costs of routine breeding activities, as well as new breeding activities, will continue to be covered by member programs and not by EiB. EiB will support proposal development to overcome joint bottlenecks. Collaboration with EiB will help to make the targets, progress, benefits, and bottlenecks of breeding programs targeting the developing world more transparent, and drive new funding to address joint bottlenecks (e.g., automation and mechanization). The information, shared knowledge and knowhow of the EiB community is a resource available to all members, while some of these resources will be available to contributors and other users.

Q8. The program I'm managing is already stretched for resources. I am excited about being involved with EiB and being a member but, despite being eligible for sponsorship, I'm concerned I will not have the resources required. What resources might I be expected to contribute?

A8. Sponsored members can expect their contribution to be limited to the time that it takes to:

1. Communicate their current (and future) status in each of the seven core areas of focus and personal ambitions for change (also see Q2).
2. Learn and implement new ways of operating as part of achieving best breeding practices. By lowering the transaction costs to learn and implement new practices, this will be time well spent.
3. Contribute organically to the community of practice, in which members collectively assist one another to achieve an improved way of operating. It is envisioned that these will be synergistic interactions in which each member, in general, receives more from the interaction, and by being a part of the process, than they are having to contribute.

Q10. The program I'm managing is already stretched for resources. I would love to take on some of the ambitions being addressed by EiB (such as genomic selection as part of better targeted genotypic data for example), but I cannot see how I could take something like this on with current resources?

A10. EiB is committed to assisting members achieve the highest possible rate of genetic gain for the time and resource investment. If a particular technology or methodology is not able to achieve this then it is not recommended. However, if a particular technology or methodology is able to achieve this, then, as with any evolutionary change to the breeding process, working with EiB will reveal how resources may be reallocated to afford the technology or methodology in question to achieve a higher rate of genetic gain.

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