Funding the Plant Breeding Revolution

Innovation in plant breeding is imperative to meet the growing demand for food and feed due to global challenges such as population growth and climate change. We need to produce more quantity and higher quality from agricultural production and this is now possible thanks to improved cultivars adapted to local conditions. With proper channels of seed distribution and access to inputs (water and fertilisers), plant breeders are at the forefront of this food revolution, most particularly in the developing world.

Some of the challenges

- Net investments of US$83 billion a year are needed in agriculture in developing countries to be prepared to feed 9 billion people by 2050—a 50% increase from what was being invested in 2010. This includes some $20 billion for crops production.
- Between 20 and 40 percent of global crop yields are lost each year due to plant pests and diseases.
- Fewer people are living in rural areas and even fewer are farmers. Producing more and better food will largely depend on increasing breeding efficiency, not farming more land.
- Many breeding programmes across the developing world are lagging behind in terms of implementing better practices and tools to deliver genetic gains to smallholder farmers.
- Progress is deferred mainly because of: restricted financial resources and skilled workforce; inadequate or insufficient infrastructure and equipment, such as access to large scale genotyping facilities; insufficient technology for the management and analysis of breeding information; limited access to information, expertise and networks.

Our offer to breeders

The Integrated Breeding Platform (IBP) provides access to the information, tools and services that breeders need to run their breeding programme. Access to IBP products, primarily in Sub-Saharan Africa and South and South-East Asia, will enable them to:
- more effective and efficient selection, saving them time and money;
- improved data management by moving into the digital era;
- the adoption of best practices and procurement of quality certifications;
- access to service providers (e.g. genotyping laboratories), reducing the need for in-house investment.

Play an impactful role in Research for Development (R4D) by:
- showcasing local competence to secure international funds;
- defining market-driven breeding priorities as central decision makers;
- accessing international networks and sources of expertise;
- providing their own expertise and support in disseminating knowledge to partners.

We cannot wait 10 to 15 years to deliver varieties anymore! Both disciplines of breeding and bio-technology need to go hand in hand if we want a faster generation of high-powered material. The IBP will allow us to federate all our efforts nationally and across the West African sub-region, and thus shorten delays, have more efficient breeding processes and avoid losing money, instead we want to see new varieties come out of our laboratories in shorter times, so that African producers may multiply their outputs, and work toward productivity increases.

www.IntegratedBreeding.net
A breeding revolution with better methodologies and support

By promoting the sustainable deployment of our products, services and networks at an institutional level, we believe that we can support and enable plant breeders to generate concrete outputs for smallholder farmers. Access to crop information, electronic data capture, advanced analytical methodologies, service laboratories, wider networks, and more educational and professional opportunities should empower breeders to bring about change on their own terms. Key drivers of this revolution are:

**Networks and local services**

Developing technology is the easy part... making sure that would-be users are supported in taking it up is proven to be the primary success factor for growth and widespread adoption of new platforms. 

An astounding 66% of information system projects fail, are cancelled or are challenged due to failure of most IS/IT interventions to effectively integrate employee adoption issues. 3

When leaders ensure that frontline staff members feel a sense of ownership, the results show a 70% success rate for transformations. Furthermore, 60% of the extremely successful change initiatives focus mostly on changing mind-sets. 6

A clear success factor is to find efficient and scalable ways to engage employees and to focus on mind-sets and behavior.

Training will prove very useful for young breeders to help them go digital in starting up their breeding programmes.  I.B.P. tools makes the breeding process a shorter one. It helps us become all-round breeders and more efficient in bringing products to end-users, i.e. families and farmers. — Lilian Njeri Gichuru, maize breeder, Kenya Agricultural Research Insti-

**Data Management**

80% of a scientist’s effort is spent discovering, acquiring, documenting, transforming, and integrating data, whereas only 20% of the effort is devoted to more intellectually stimulating pursuits such as analysis, visualisation, and making new discoveries. 3

The business cost of poor quality data may be as high as 15-25% of an organisation’s revenue, and as much as 50% of the typical IT budget may be spent in “information scrap and rework”. 5

Better data quality at the source, and a 15% cost reduction thanks to better performing tools and processes, would considerably boost breeding programmes’ efficiency. Reducing the time and resources required for each crop breeding cycle will increase their capacity to deliver more crop varieties to farmers locally.

“It used to take me up to three months before I could analyse the data I had collected in the field. Thanks to electronic data capture, I can now proceed with my analysis on the same day. ”

— Cyril Diatta, sorghum breeder and molecular biologist, Nigeria

**Molecular breeding**

Phenotypic selection can be greatly enhanced by the use of markers, especially for complex traits easily affected by the environment. Their integration maximizes net value, making for an increasingly attractive economic proposition: MABC’s estimated to have saved at least 2-3 years in the development of the submergence gene for rice in Asia, resulting in significant incremental benefits in the range of USD 300 to 800 million in Nigeria, Ghana and Uganda, marker-assisted breeding is estimated to have saved at least 4 years in the breeding cycle for cassava varieties resistant to pests, which will result in incremental net benefits over 25 years in the range of USD 34 to 800 million.

What we’re seeing is a paradigm shift. Now, the developing-country programmes have the boldness and capacity to do molecular breeding and accurate phenotyping for themselves. We built an image for ourselves in Nigeria and in Africa (…) and other global actors, on seeing our ability to deliver results, are now choosing to invest in us. — Chiedozie Egesi, molecular plant breeder, National Institute for Agricultural Research, Nigeria

**Our products and services**

**Technology**

The Breeding Management System (BMS Pro) is a suite of interoperable software applications specifically designed for breeders.

- Better breeding
- Better seeds
- Yields & Quality

Electronic data capture and sharing: our BMS Pro is a suite of interoperable software applications specifically designed for breeders. BMS Pro is a technologically advanced management system that integrates new genotyping, phenotyping, and transactional data capture of crop varieties across the globe.

**Our targeted outcome**

Plant breeding programmes in national institutes, CGIAR centres and SMEs using I.B.P. products and services are increasing the rate of genetic gain, productivity and quality in staple food crops for local farmers, contributing to food security and poverty alleviation.