

# The Business of Plant Breeding

## Market-led approaches to new variety design in Africa

### DEMAND-LED BREEDING



## Workshop Participants

"This course met all of my expectations. I will now consult with more people in my crop value chain. I want their advice and buy-in to my variety designs and breeding program."

"Proper understanding of clients' needs is vital to be a successful breeder."

"I do not just want to get my varieties released. I want to see them growing on large hectarages and farmers able to sell them at a good price in their local markets. This training course has given me methods to achieve this goal."

"As a result of this workshop I am going to change the activity plan in my bean breeding program and do more market research."

"Designing a product profile and setting quantitative targets for each variety characteristic is very useful."

"Creating a development strategy and analysing all risks was new for me."

## Pan African Educators

"Demand-led plant breeding is a significant and potentially game-changing initiative for the region, especially notable because it is home-grown."

Professor Eric Danquah – WACCI, Ghana

"Demand-led plant breeding requires sustained and regular interactions with all the crop value chain stakeholders about the varieties being developed. It complements and goes farther than the farmers' discussions characteristic of the Participatory Rural Appraisal (PRA) taught within PhD curricula."

Professor Pangirayi Tongoona – WACCI, Ghana

"Breeding for the requirements of whole value chains requires breeders to update and review their practices. This is why we must start with education, focussing on promoting and developing African breeders with the right skills to develop new varieties for the markets. It is here that the change has to begin."

Dr Jean Claude Rubyogo – CIAT, Tanzania



Prof. E. Danquah  
WACCI, Uni Ghana



Prof. P. Tongoona  
WACCI, Uni Ghana



Dr A. Danquah  
WACCI, Uni Ghana



Prof. A. Djikeng  
BecA, Kenya



Dr N. Yao  
BecA, Kenya



Prof. H. Shimelis  
ACCI, South Africa



Dr J. C. Rubyogo  
CIAT, Tanzania



Dr R. Chirwa  
CIAT, Malawi



Prof. P. Kimani  
Uni Nairobi, Kenya



## Education module



### More information\*

The module is available as a training manual\* for professionals who are interested in demand-led breeding and for use by educators who teach postgraduate level plant breeding, crop improvement and seed systems. The manual contains 7 chapters, each of which includes case studies and slide presentations as teaching aids, and practical computer-based planning tools provided by Syngenta AG.

**As an educator** – you can request a copy of the training manual\* either from the training course co-ordinators in Africa ([ptongoona@wacci.edu.gh](mailto:ptongoona@wacci.edu.gh), [n.yao@cgiar.org](mailto:n.yao@cgiar.org) or [shimelish@ukzn.ac.za](mailto:shimelish@ukzn.ac.za)) or by contacting the publisher, CABI, Wallingford, UK. ([www.cabi.org/contact-us](http://www.cabi.org/contact-us)).

**As a participant** – you can obtain details of the next training opportunity from Professor Pangirayi Tongoona ([ptongoona@wacci.edu.gh](mailto:ptongoona@wacci.edu.gh)) at the West Africa Centre for Crop Improvement (WACCI), University of Ghana, Accra or Dr Nasser Yao ([n.yao@cgiar.org](mailto:n.yao@cgiar.org)) at BecA-ILRI Hub, Nairobi, Kenya (for eastern and southern Africa).

\* *The Business of Plant Breeding: Market-led approaches to new variety design in Africa* (eds G.J. Persley and V.M. Anthony) CABI International, Wallingford UK. (2017, in press).

# Demand-led Plant Breeding

## Education module

Demand-led plant breeding (DLB) is a methodology that recognises the importance of both identifying and understanding market opportunities and actively designing new plant varieties to deliver the needs of farmers and their value chains. DLB advocates using these best practices and integrating them with the most effective breeding technologies to create new markets and shorten new variety development timescales.

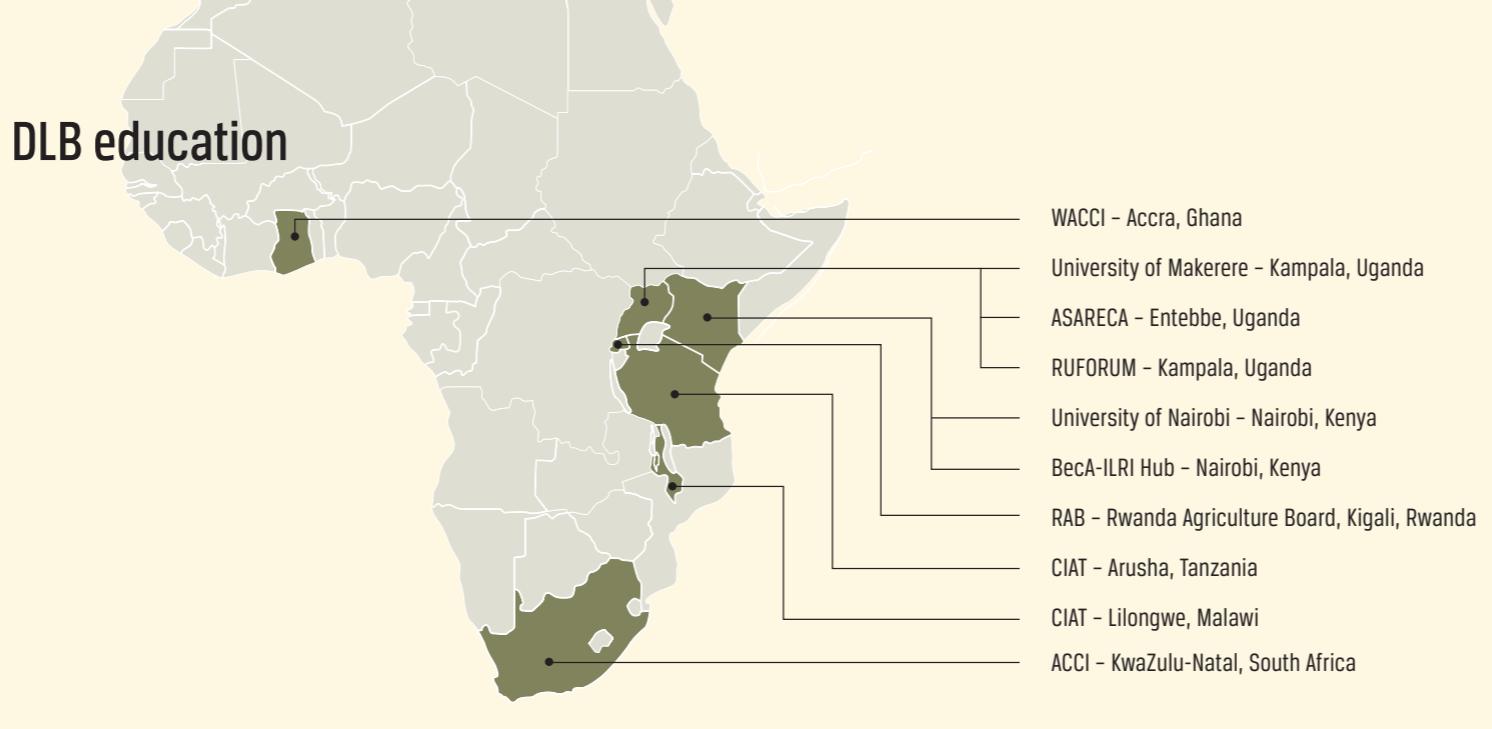
The education module has been created by an educators' group of expert plant breeders, from national, regional and international research institutes and universities throughout Africa, with responsibilities for postgraduate education and professional development of plant breeders. It contains state-of-the-art best practices and methodologies from both the public and private sectors in Africa and internationally.

## Who is the education module for?

Professionals in plant breeding and related disciplines who are interested in developing and disseminating new plant varieties, as a way to increase productivity and profitability in crop agriculture, especially in Africa. It is also intended as a resource for the education of postgraduate scholars in plant breeding and genetics and for the continuing professional development of plant breeders and their supporting science teams.



## DLB education



## Education module content

This education module comes from a study on *Demand-led Plant Variety Design for Changing Markets in Africa*. Its purpose is to identify and share best practices in demand-led plant breeding from private and public sector breeding programs worldwide. The module contains seven units and has been developed by experienced plant breeders and educators:

### 1 Principles of Demand-led Plant Variety Design

*Paul Kimani*

*(University of Nairobi)*

This unit discusses the status and challenges of agriculture in Africa and ways of transforming the agricultural sector into a modern, commercially oriented sector within the countries of Africa. It identifies the key principles of demand-led variety design; how it differs from and complements other approaches; its relationship to innovation systems and value chains; the role of public policy and social dimensions; and the benefits and risks of implementing a demand-led breeding program.

### 2 Visioning and Foresight for Setting Breeding Goals

*Nasser Yao, Appolinaire Djikeng*

*(Biosciences eastern and central Africa - BecA/ILRI Hub)*

*and Jonathan Shoham*

*(Syngenta Foundation for Sustainable Agriculture)*

This unit focuses on the skills and methodologies necessary to understand the changes taking place in Africa's food and agricultural production. It describes how to use foresight to anticipate future demand and incorporate these findings into new variety designs and plant breeding goals.

### 3 Understanding Clients' Needs

*Pangirayi Tongona, Agyemang Danquah and Eric Danquah*

*(West Africa Centre for Crop Improvement, University of Ghana)*

This unit enables breeders to: (i) Define their clients and stakeholders; (ii) Understand different categories of clients and their activities in value chains; (iii) Identify market segments and their importance in determining the number of new varieties required.

### 4 New Variety Design and Product Profiling

*Hussein Shimelis*

*(Africa Centre for Crop Improvement, University of KwaZulu-Natal)*

This unit describes best practices in how to design new crop varieties that will achieve high adoption rates because their varietal characteristics serve the needs and preferences of farmers, processors, consumers and other stakeholders in the crop value chain. It includes a Product Profiling Spreadsheet for Plant Variety Designs, a planning tool made available by Syngenta AG.

### 5 Variety Strategy Development and Stage Plans

*Rowland Chirwa*

*(International Centre for Tropical Agriculture, Malawi)*

This unit describes and enables plant breeders to address five critical issues in new variety development. These are: Creating a new variety development strategy; Developing a stage plan and decision-making; Understanding timelines and critical paths; Risk management; and Variety registration.

### 6 Monitoring, Evaluation and Learning

*Jean Claude Rubyogo*

*(International Centre for Tropical Agriculture, Tanzania)*

*and Ivan Rwmushana*

*(Association for Strengthening Agricultural Research in Eastern and Central Africa)*

This unit empowers breeders to design, integrate and implement plans that demonstrate best practices in monitoring, evaluation and learning in their demand-led breeding programs, including setting targets based on key performance indicators.

### 7 The Business Case for New Variety Development

*Rowland Chirwa*

*(International Centre for Tropical Agriculture, Malawi)*

This unit enables plant breeders to create a compelling case for investment in demand-led plant breeding to convince R&D management, government officials and financial investors. This includes exploring whether the investment in demand-led breeding can be justified in terms of the likely economic, social and environmental benefits versus the costs of developing a new variety.

## Education approach

The education module has been designed using the Socratic method for learning. This involves self-reflection by participants on many key questions breeders face on a daily basis in their work programs. It requires participants to

- Share their professional experiences and information in discussion groups
- Analyse case studies to identify best practices
- Use computer-based tools to create variety designs and investment modeling
- Undertake assignments to translate and integrate points of learning into participants' own plant breeding programs

The module can be delivered as:

1. A professional 2-3 day training workshop
2. A series of seminar discussions within a certificated postgraduate program
3. An electronic distance learning course for self study (under development)

The education module provides the greatest learning opportunity when face-to-face training involves a variety of participants working in public and private breeding programs, seed companies and downstream value chain organisations such as processors and retailers, together with government officials responsible for varietal registration. This broader participation enables sharing of perspectives and experiences and helps to support the creation of networks of key professional contacts essential for effective new variety design that will encourage adoption by farmers and their value chains.

