

CROPS FOR THE FUTURE RESEARCH CENTRE

PROGRAMME CONCEPT NOTE

BAMYIELD

Developing bambara groundnut as an exemplar underutilised crop species

Problem Statements

- Bambara groundnut has potential as a crop due to its drought tolerance and good nutritional composition. However, pod yields can be low and/or erratic. This may be due to its photoperiod requirement for pod-set and/or problems with fertility in some landraces.
- Crop improvement programmes on major species have attracted significant investment from national governments and breeding companies over many decades. In contrast, support for research and breeding on underutilised crops has been insignificant.
- Applying data and expertise from major crops to promising underutilised species, such as bambara groundnut, is an effective use of research investment on major crops for transfer to other species.
- Since there are no true *varieties* of bambara groundnut, crop yields are derived from farmers own landraces. The development of crop varieties of bambara groundnut with desirable agronomic traits for different environments is an essential prerequisite for its greater uptake and use.
- Most underutilised crops are grown under sub-optimal conditions and management regimes. This makes yield prediction and modelling difficult. Understanding the basis for plant to crop canopy transition is important for predicting appropriate agronomic practices in different environments.
- Researchers at the University of Nottingham and partners in Africa, Asia and Europe have collaborated in research on bambara groundnut for many years. Integrating and evaluating this collective experience within a wider sociocultural context can be used to develop generic approaches for multidisciplinary research into the improvement of many other underutilised species that face similar challenges.
- The available and proposed research on bambara groundnut provides an excellent opportunity to develop and test generic approaches to enhance take up of underutilised crops among user groups.

Objective

To develop multidisciplinary approaches, tools, methodologies and genetic resources to address the limiting factors in the adoption of underutilised crops using bambara groundnut as an exemplar crop.

Outcomes

- New understanding of technical and sociocultural constraints to greater uptake of bambara groundnut.
- Application of data on bambara groundnut for the construction of the CropBase platform prototype.
- An international crop improvement and breeding programme on bambara groundnut as a generic model for other underutilised species.

Programme Concept

In country, field-based breeding selection will be supported by focused research to address specific issues. BamYield will address issues of fertility, translation of data from major to minor species with the use of Next Generation Sequencing approaches, mathematical modelling of canopy development for prediction and selection and a novel approach to crop breeding. Sociocultural and transdisciplinary issues in the research into and uptake of bambara groundnut by different communities will be addressed as part of the research process to identify transferable approaches to other underutilised crops.

Potential CFFRC Partners

University of Nottingham, Reading University (UK), Diversity Arrays Technology (Canberra, Australia). Potential partners include collaborators in Malaysia, Indonesia, Thailand, Ghana, Burkina Faso, Sierra Leone and South Africa.

Programme Activities

A workshop will be held in Malaysia to identify partner roles and responsibilities, practical objectives for international breeding and research activities and management structure.

Whilst the initial focus will be on genetics and breeding, transdisciplinary activities, end-user participation and existing knowledge on bambara groundnut will be integrated into each stage of the programme for longer term sustainability and outcomes.

The *process* of the research activities will provide a mechanism for the development of a general methodology for application to other underutilised crops.

The programme will incorporate data into the CFFRC CropBase web-based platform.

CFFRC`250PLUS' Postgraduate Research Studentship Opportunities

Research studentships (PhD and MRes) are available through the CFFRC250PLUS Scholarship Scheme.

Prospective supervisors should consult the Guide for Applicants, available at:

<http://www.nottingham.edu.my/CFFRC/documents/CFFRC250studentGuide.pdf>, and submit a

Studentship Application Proposal, available at:

<http://www.nottingham.edu.my/CFFRC/documents/CFFRC250studentApplication.pdf>.

For this call, completed applications for CFFRC250 Studentships should be submitted by **FRIDAY 1 JUNE 2012** to; Applications@cffresearch.org.

For more information, please contact: Enquiries@cffresearch.org or Crops for the Future Research Centre, c/o University of Nottingham Malaysia Campus, Jalan Broga, 43500 Semenyih, Selangor, Malaysia.