

History of research leading to inception of BamYIELD research programme at CFF

The bambara groundnut research conducted by the BamYIELD research programme at CFF is built on a solid foundation of previous projects led by the University of Nottingham UK and partners, funded by international agencies such as the European Union (EU), the UK Department For International Development (DFID) and the Food and Agriculture Organisation of the United Nations (FAO).

The research leading to BamYIELD started in the University of Nottingham in the early 1990's, and since 1992, the main source of research support has been the EU. The first EU funded project, BAMGROW (1992-96) assessed the agro-ecological potential of the crop and linked field experiments in Tanzania, Botswana and Sierra Leone with experiments and analysis in the UK and the Netherlands. In 1995, The International Bambara Groundnut Network (BAMNET) – a network approach for partnership in research and development of a neglected and underutilised crop was developed to enable wider dissemination of research data on bambara groundnut projects. A DFID Crop Post Harvest Programme funded project was carried out to assess opportunities to increase utilisation of bambara groundnut in Southern Africa (2000 – 2001). The University of Nottingham UK and FAO incorporated the BAMnut crop yield model into a Geographical Information System (GIS) to predict for the first time bambara groundnut production for the world, a study published for FAO (2001). The EU BAMFOOD project aimed to link initial molecular, physiological and agronomic studies between partners in Africa (Botswana College of Agriculture, University of Swaziland and Ministry of Agriculture, Water and Rural Development, Namibia) and Europe (University of Nottingham, UK and Technical University of Munich, Germany)(2001-2004). A third EU-funded project was launched to evaluate the nutritional, ecophysiological and molecular characteristics of bambara groundnut landraces (2006-2011). Using calibration from the BamGRO model and tropical glasshouse experiments, FAO's AquaCrop model for the growth and yield of two bambara groundnut landraces from differing climatic regions was used to predict new potential growing regions and more recently for climate change scenarios in Malaysia.

These projects also saw several years (2002, 2006–2009, 2011-2014) of glasshouse experiments conducted at the Tropical Crops Research Unit, University of Nottingham (UK) growing bambara groundnut as crop stands in soil pits under controlled environments with different landraces, temperatures and soil moisture regimes (irrigated, early drought, late drought, photoperiod regimes). Parallel to this, field experiments were conducted in Swaziland (2002/2003) and Botswana (2007/2008) as part of the EU funded projects with partners in both countries, with field experiments initiated at the CFF Field Research Centre in 2014 and a series of Partner locations world-wide planned for 2015.

In 2011, Crops For the Future (CFF) was launched, and in 2012 two bambara groundnut stakeholders' workshop were held in Malaysia, followed by a third workshop in Ghana in 2013.

In 2008, the BAMNET website closed down, but has since been resurrected under a new name 'BamNetwork' by CFF in 2014 after buy-in from research partners and attendees of the 3rd International Bambara Groundnut workshop held in Accra, Ghana on 24th September, 2013; a side event at the 3rd Neglected and Underutilised Species Conference (3rd NUS2013). www.bambaragroundnut.org

Table 1: Summary of all bambara groundnut projects that lead to the inception of BamYIELD research programme at CFF

Project	Coordinator and Partners	Funding / grant
<p>Evaluating the potential for Bambara groundnut as a food crop in semi-arid Africa An approach for assessing the yield potential and ecological requirements of an underutilised crop (BamGROW)</p> <p>Duration: 1992 – 1996</p>	<p>Project leader: Professor Sayed Azam Ali (University of Nottingham, UK)</p> <p><u>Partner institutions:</u></p> <ul style="list-style-type: none"> i. Department of Agronomy, Wageningen University (Netherlands) ii. Department of Crop Science and Production, Sokoine University of Agriculture (Tanzania) iii. Botswana College of Agriculture (Botswana) iv. Department of Biological Sciences, Njala College (Sierra Leone) 	<p>European Commission supported STD-3) projects (1992-1995) under FP3-STD-3 programme</p>
<p>Increasing the productivity of bambara groundnut (<i>Vigna subterranea</i> L. verdc) for sustainable food production in semi-arid Africa (BamFOOD)</p> <p>Duration: 2000 – 2004</p>	<p>Project coordinator: Professor Sayed Azam Ali (University of Nottingham, UK)</p> <p><u>Partner institutions:</u></p> <ul style="list-style-type: none"> i. Botswana College of Agriculture (Botswana) ii. Technical University Munich, (Germany) iii. Mahanene Research Station, Ministry of Agriculture, Water, and Rural development (Namibia) iv. University of Swaziland (Swaziland) 	<p>Funded under European commission FP5-INCO 2 Programme for research, technological development and demonstration on "Confirming the international role of Community research; 1998-2002"</p>
<p>Assessing opportunities for increased utilisation of bambara groundnut in Southern Africa (R7527)</p> <p>Duration: 2000 – 2001</p>	<p>Project leader: Professor Sayed Azam Ali (University of Nottingham, UK)</p> <p><u>Partner institutions:</u></p> <ul style="list-style-type: none"> i. Intermediate Technology Development Group, (ITDG, Zimbabwe)* ii. University of Swaziland. <p>*currently known as Practical Action</p>	<p>Funded under Department for International Development (DFID) Post harvest programme</p>
<p>Increasing the productivity of bambara groundnut (Training programme)</p> <p>Duration: 2001</p>	<p>Project coordinator: Professor Sayed Azam Ali (University of Nottingham, UK)</p> <p><u>Partner institution:</u></p> <ul style="list-style-type: none"> i. University of Swaziland (Swaziland) 	<p>Funded under European commission FP5-INCO 2 (Programme for research, technological development and demonstration on "Confirming the international role of Community research; 1998-2002")</p>

<p>Molecular, Environmental and Nutritional Evaluation of Bambara Groundnut (<i>Vigna subterranea</i> L.Verdc.) for Food Production in Semi-Arid Africa and India (BamLINK)</p> <p>Duration: 2006 – 2011</p>	<p>Project coordinator: Professor Sayed Azam Ali (University of Nottingham, UK)</p> <p><u>Partner Institutions:</u></p> <ul style="list-style-type: none"> i. Botswana College of Agriculture (Botswana) ii. University of Copenhagen (Denmark) iii. Technical University Munich, (Germany) iv. Crops Research Institute (Ghana) v. University of Agriculture Science, Bangalore (India) vi. University of Namibia (Namibia) vii. Central and Arid Zone Research Institute (India) viii. National Plant genetic Resources (Tanzania) 	<p>Funded under European commission FP6-INCO DEV (Specific measures in support of international cooperation: Specific activities covering wider field of research under the Focusing and Integrating Community Research programme, 2002-2006)</p>
<p>Calibration and validation of FAO AquaCROP for bambara groundnut (2009 – 2011)</p>	<p>University of Nottingham, UK Sabaragamuwa University of Sri Lanka Land and Water Division of Food and Agriculture Organization (FAO) BamLINK partners Botswana College of Agriculture (Botswana)</p>	<p>Data used for calibration and validation for this was a part of EU BAMLINK (INCO-CT-2005–015459) project funded through the EU Framework 6 Programme</p>