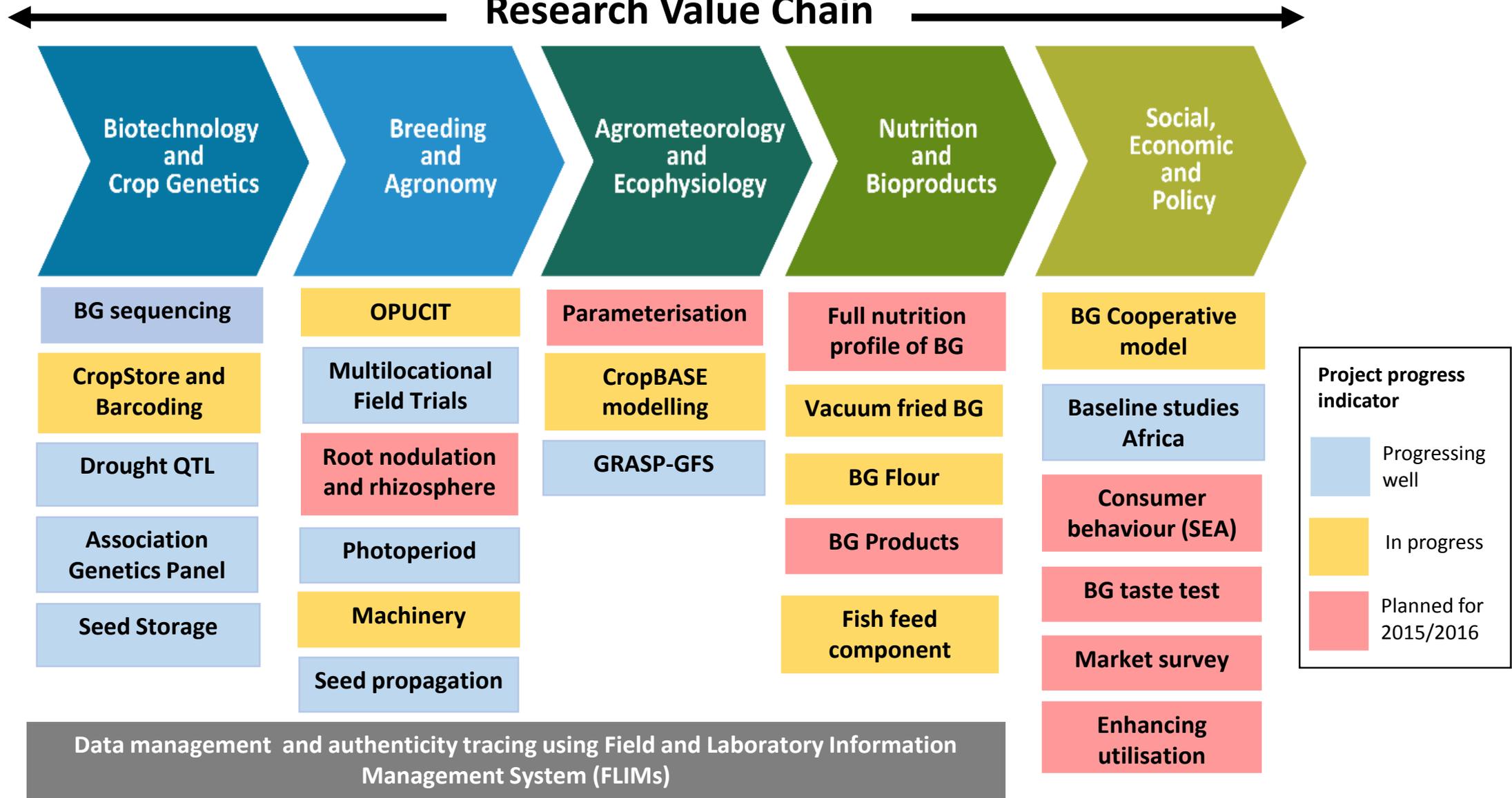
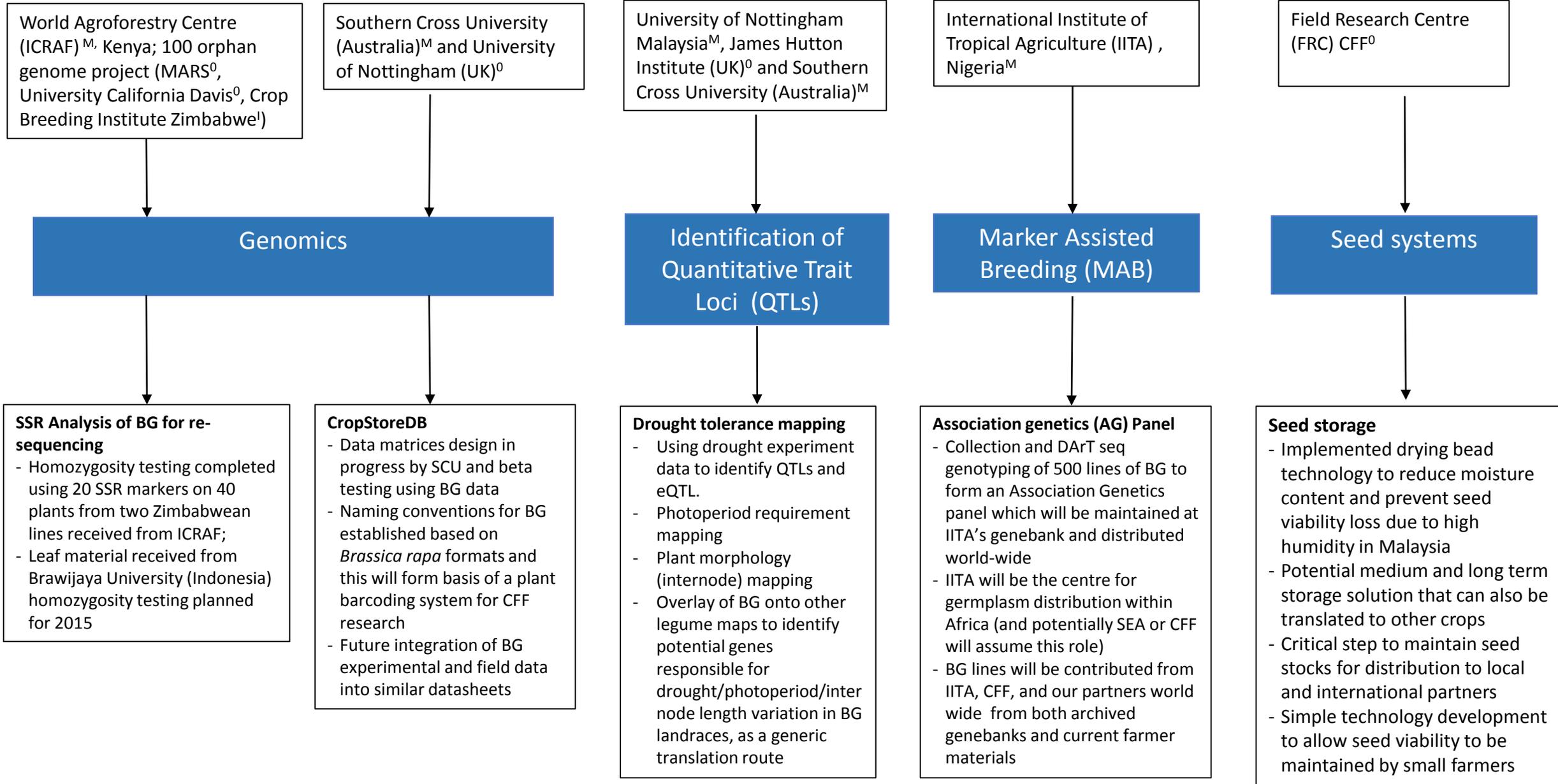


# Research Value Chain



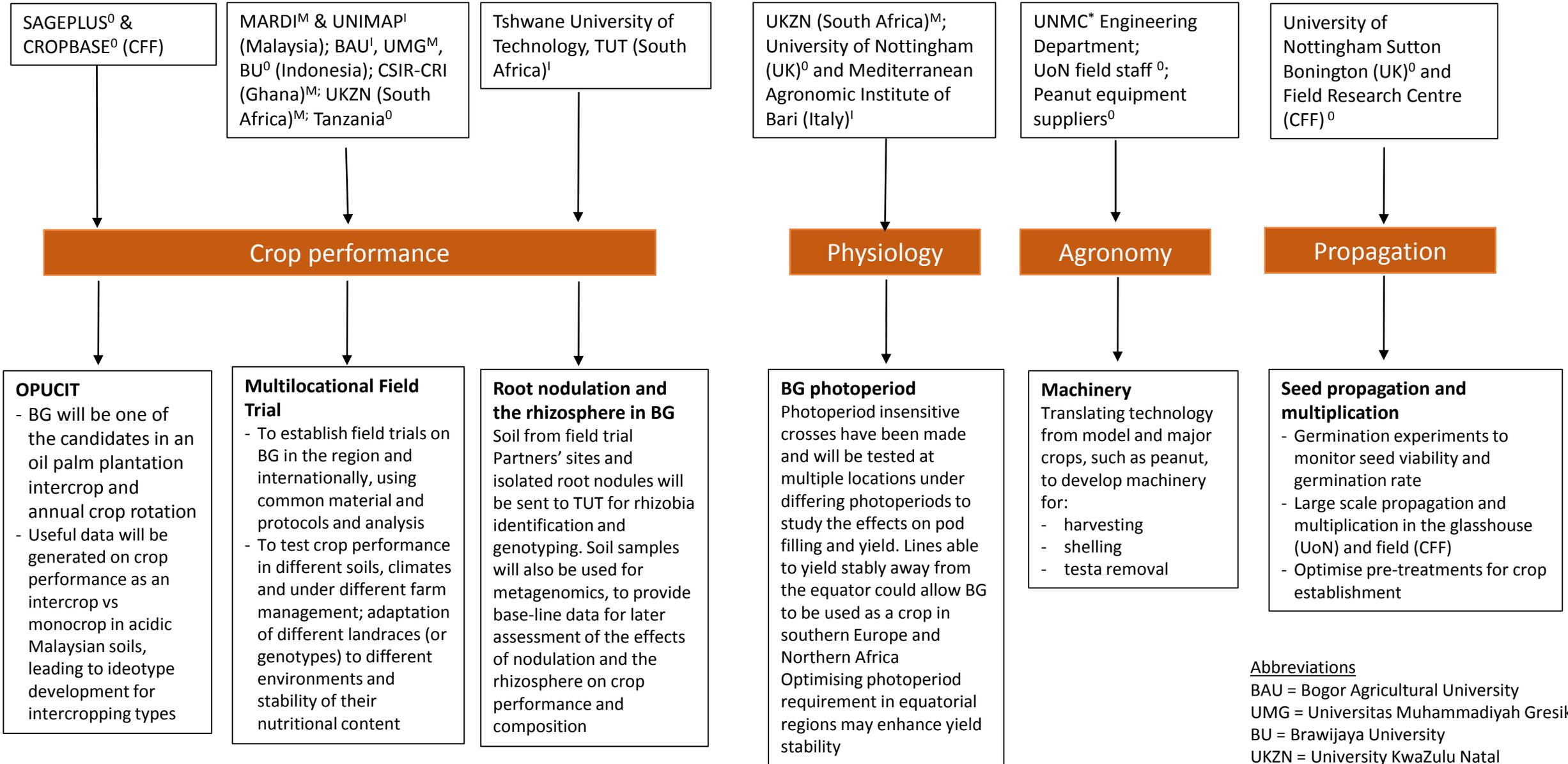
# BIOTECHNOLOGY AND CROP GENETICS

Note:  
 M: MOU signed; I: MOU in progress; 0: MOU not needed.  
 An (\*) denotes Service Level Agreement (SLA) is in place



# AGRONOMY AND BREEDING

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# AGROMETROLOGY AND ECOPHYSIOLOGY

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CropBASE<sup>0</sup> (CFF), Sabaragamuwa University of Sri Lanka<sup>M</sup>, University of Nottingham Triumph Park Campus (UK)<sup>0</sup> and Southern Cross University (Australia)<sup>M</sup>

## Crop growth modelling

### Parameterization of landraces

- Experimental protocols that will enable yield modelling of specific BG genotype performance to be integrated into the common multilocational field trials (MLFT) protocol, providing experimental data to underpin assessment in multiple environments of the same genotypes and allowing greater accuracy in prediction of their performance in other environments. This allows suitability mapping, but coupled with data generated simultaneously from the MLFT for multiple genotypes, could allow an assessment of G x E and extrapolation to new genotypes of the modelling predictions

### CropBASE Modelling

- AquaCrop modelling data is available on the performance of two BG landraces (Uniswa Red – originally from a sub-humid environment and S19-3 from an arid environment) in semi-arid Africa (South Africa)
- Data has been used to predict yield of the same two BG landraces in Malaysia, showing that both landraces will perform well. This will be validated at local field sites

### GRASP-GFS

- Using a geospatial approach for the analysis of BG germplasm and predictive selection of potential breeding lines for new environments (in tandem with wheat as a comparator)
- Investigation of genetic distance, climatic conditions and population movement as forces which have selected bambara groundnut landraces over thousands of years.
- This will involve crop specific data and processing models to forecast geospatially associated trait variation for each crop

# NUTRITION AND BIOPRODUCTS

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Southern Cross University (Australia)<sup>M</sup>  
and University of Nottingham Malaysia  
Campus (UNMC)<sup>\*</sup>

Mamee Double Decker (M) Sdn  
Bhd<sup>0</sup>

University Malaysia Perlis  
(UNIMAP)<sup>I</sup>

University of  
Nottingham Malaysia  
Campus (UNMC)<sup>\*</sup>

FishPLUS<sup>0</sup> (CFF)

## Nutrition and Composition

## BG products and derivatives

### Full nutritional profile of BG

- Generate full nutritional workup of single genotypes grown in different environments (soil/agronomy/climate)
- Material harvested from our partner fields in Ghana, South Africa and Indonesia, as well as glasshouse (UoN) will be sent for nutritional analysis at SCU and/or CFF/UNMC
- To investigate the relationship between genetic variability, growing conditions, climate and farm management to profile nutritionally a core collection of 12 BG genotypes
- Compositional and structural analysis of BG seed to investigate some of the common issues with this crop, such as long cooking time, and also possible processing methods available

### Vacuum fried BG

- Mamee have already produced a pilot vacuum fried BG
- Harvest of material from large scale multiplication of material for Mamee is underway at FRC. Another round of multiplication is expected to start February 2015
- Currently evaluating new sources of material for processing while scaling up of production until field scale begins in Malaysia, starting with partners in Indonesia
- Full nutritional analysis will contribute to decision to adopt BG or not

### BG Flour

- UNIMAP have experimented using BG flour in instant noodles as a way of increasing the nutrition levels
- We plan to collaborate with UNIMAP to evaluate the possibility of this as a novel BG product for the Malaysian food industry, alongside other potential BG products (health drinks, local snack)

### BG products

- Discussions with UNMC to conduct preliminary experiments on making baked goods using a composite wheat-BG flour with a sensory evaluation of products
- Evaluation of basic snack and cooked products with sensory evaluation
- A project to investigate the feasibility of a probiotic BG beverage will also begin this year

### Fish feed

- The FishPLUS team are investigating the possibility of using a protein extract from BG as a component replacement of fish feed, as a potential substitute for components of fish feed
- Isolation of other components and their functionality and potential use to replace components of current major crops in existing products will be investigated

# SOCIOECONOMICS AND POLICY

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