

CODE: **MAW:01 2008**

INSTITUTE: Bvumbwe Agricultural Research Station
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RESEARCH GROUP: **Studies in genetics and chemistry of tropical roots and tuber crops in Malawi**

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Staff			Students			
Academic PhD	Academic Other	Tech-nicians	Sandwich PhD	Local PhD	Sandwich MSc/MPhil	Local MSc/MPhil
8	1	1	1	1		2

Awarded degrees	96/02		2003		2004		2005		2006		2007		2008	
S=Sandwich; L=Local	S	L	S	L	S	L	S	L	S	L	S	L	S	L
PhD									1					1
MSc/MPhil/Licentiate														

Publications	96/02	2003	2004	2005	2006	2007	2008
International journals	2		1		1	1	1
National journals							
Conference reports	3	2		1	5		

Arrangement of work-shops/symposia/conf.							

Visits by IPICS staff/ Swedish scientists							
	2/	1/	1/		2/		

No. of participants trained in IPICS prog.	Sweden or other country in Europe	Regional laboratory
Until December 2008	3	5

IPICS funding (total for the specified period)	Period of funding	Fellowship months (total no.)	Training costs (k-SEK)	Other costs (k-SEK)	Total (k-SEK)
	2002-2008	19	583	1595	2178

Cooperation initiated	2002 (as part of the IPICS-supported Cassava Safety Network from 1997)
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SUMMARY OF THE RESEARCH GROUP MAW:01

Tropical root and tuber crops (cassava, sweet potato, and yam) have complex roles to play in feeding the developing world in the coming decades. It is forecast that by 2020, more than two billion people in Asia, Africa, and Latin America will depend on these crops for food, feed, or income. Many of them will be among the poorest of the poor. Thus, current decisions about research investment on tropical root and tuber crops, and the strategy chosen for this research have profound implications for people around the world now and for decades to come.

Despite the importance of these crops, scientists working to improve these crops have little understanding in terms of their genetics, available genetic resources and many other aspects of these crops, which hamper the efficiency and effectiveness of their improvement programmes. Lack of trained staff and appropriate equipment leaves them with the option of using the conventional methods that take long to get tangible results.

The primary aim of this research group is to build the capacity in the use of new techniques in chemis biology and biotechnology to compliment conventional approaches of conducting research on tropical roots and tuber crops in Malawi, through training and repair and acquisition of labora equipment and consumables. The research group will also generate useful scientific information on the genetics and genetic resources of tropical roots and tuber crops, mainly cassava and sweet pot which will help increase the effectiveness and efficiency of future research activities within Malawi, regionally and internationally. The ultimate beneficiaries will be the rural poor mass who depend on these crops for their livelihood.

During the year, the research group will centre its activities on sweet potato genetic resources studies using molecular (SSR) markers and analytical chemical methods, and evaluation of functional/physicochemical properties and starch granular characteristics of flour from cassava genotypes in Malawi. This work will be done as PhD thesis work for, Felistus Chipungu (Mrs) the only lady scientist in the research group on roots and tubers, who is also the sweet potato breeder and Ibrahim R. M. Benesi, who successfully completed his MSc degree work (with distinction) last year, in South Africa at the University of Free State, is conducting this study for his PhD thesis. He did his MSc thesis work on some aspects of cassava starch. It is hoped that there will be continued funding for both students to complete their PhD studies.

Both research studies also seeks to bring the full potential of agricultural and nutrition science to bear on the persistent problem of micronutrient malnutrition (Biofortification). The ultimate goal is to reduce mortality and morbidity rates related to micronutrient malnutrition and increase food security, productivity, and the quality of life for poor populations of developing countries by providing useful information to cassava and sweetpotato breeders to breed varieties that provide, at low cost, improved levels of bio-available micronutrients in a fashion sustainable over time and also starch properties required by the industries for various uses.

Keywords: Cassava, Manihot esculenta, Malawi, Sweetpotato, Characterisation, diversity

Training, research visits:

Year	Participant (months)	Research host	Research field
(1997	Jonathan Mkumbira (1)	U Gullberg, SLU	Cyanogenesis in cassava breeding)*
(1998	Jonathan Mkumbira (4)	U Gullberg, SLU	as above)*
(1999	Jonathan Mkumbira (5)	U Gullberg, SLU	as above)*
(2000	Jonathan Mkumbira (9)	U Gullberg, SLU	as above)*
(2001	Jonathan Mkumbira (10)	U Gullberg, SLU	as above)*
2002	Jonathan Mkumbira (8)	U Gullberg, SLU	as above
2003	Ibrahim Benesi (3)	M Labuschange, Univ. of Free State Bloemfontein, South Africa	Cassava starch
2003	Ibrahim Benesi (1)	Wageningen Univ., Netherlands	Molecular markers for plant breeding
2003	Felistus Chipungu (1)	Wageningen Univ., Netherlands	Molecular markers for plant breeding
2004	Ibrahim Benesi (3)	M Labuschange, Univ. of Free State Bloemfontein, South Africa	Molecular Biology
2004	Felistus Chipungu (1)	M Labuschange, Univ. of Free State Bloemfontein, South Africa	Sweet potato germplasma
2007	Davies Mweta (6)	M Labuschange, Univ. of Free State Bloemfontein, South Africa	Plant Genetics
2008	Margaret Mkambankhani (1)	E Koen, Univ. of Free State Bloemfontein, South Africa	Plant Genetics

* (funding within the former Cassava Safety Network)

Visit to Sweden:

Visits by IPICS staff/reference group:

M Åkerblom	2002, 2004
T Solomon (IPICS ref group)	2002
Linnea Sjöblom	2006
Peter Sundin	2006

Funding: (k-SEK)

Years	Training/ Exchange	Other project costs (equipment etc.)	Total
2002	138	11	149
2003	128	224	352
2004	-	309	309
2005	-	432	432
2006	-	212	212
2007	137	258	395
2008	180	149	329
Total	583	1595	2178

Financial support from other sources:

- 1) Government of Malawi (Staff salaries, Office space, etc)
- 2) IITA/SARRNET & CIP