

# Root and Tuber Crops for Agricultural Transformation in Malawi (RTC-Action Malawi)

In 2018, with technical backstopping from International Potato Center (CIP), three new OFSP varieties were released in Malawi. These varieties are suitable for different agro-ecological zones of Malawi including drought prone areas. They are suitable for household utilization for food and nutrition security. Further, the varieties have been tested and are good for puree processing for baked products.



**Fig 1** Senior CIP scientists (Jan Low, left) with Felistus Chipungu inspecting the good yield of the newly released variety Royal Choice

## What is the problem?

In 2011, CIP Malawi with funding from Irish Aid through the Rooting out Hunger project, contributed to the successful release of five improved orange-fleshed sweetpotato (OFSP) varieties. These varieties are currently being widely promoted by CIP, government and non-governmental agencies that are working to support food and nutrition security in the country. In addition to food security, OFSP promotion also aims to contribute towards the reduction of vitamin A deficiency among under five children, lactating and pregnant mothers in Malawi. However, among these improved varieties, only Kadyaubwerere is deep orange with a diversity of use options, namely crisping, pureeing for baked products and the traditional roasting and boiling. RTC-ACTION Malawi project is working with different stakeholders to promote the value addition of Root and Tuber Crops (RTCs) for income generation among actors across these value chain. Apart from agro-processors, actors that are benefitting from value addition include multipliers of planting material, root and tuber producers, transporters, middle men, employees of the processing industries etc.

## What do we want to achieve?

As agro-processing of RTCs expands in Malawi, breeders need to develop varieties that not only produce well under unstable climatic conditions, but meet the characteristics that processors want, such as smooth shape, amount of sugars, dry matter, etc. Malawi needs more varieties like Kadyaubwerere which has a diversity of use, produces well in different agro-eco zones of Malawi and can keep longer both in the field and after harvesting. CIP and partners are also working to respond to the commercialization needs of OFSP in Malawi to ensure constant supply of roots to sustain the emerging markets.

## Where are we working?

Breeders from CIP in close collaboration with scientists from the Department of Agricultural Research Services (DARS) are working to develop improved sweetpotato varieties befitting commercialization in Malawi. The varieties developed will be accessed by all Malawians to support household food and nutrition security as well as entrepreneurs who will use the various varieties for agro-processing.

## Where are we working?

CIP is strengthening OFSP value chains in Chikwawa, Nsanje, Mulanje, Chiradzulu, Zomba and Blantyre districts by facilitating linkages among farmers and to Universal Industries Limited, a major processing company.

## How are we making it happen?

As per its global mandate, CIP facilitates germplasm exchange among national breeders to broaden the genepool base for variety development. Further, CIP provides technical backstopping support through Sweetpotato Support Platforms (SSPs) in Uganda and Mozambique in this region of SSA. In 2011 several families of true seeds were received from Uganda as a source of potential new



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Fig. 2 New (2018) release OFSP varieties of Malawi (Credit F. Njunge)

varieties with virus-resistant parents. A series of breeding trials were conducted over seasons and in different locations. Farmers participated in the evaluation and selection of locally adapted varieties in different agro-ecologies. In addition to developing nutritious roots with wide end uses, our efforts are also to develop varieties that are drought tolerant and can keep for some months on open air storage without rotting. This is to ensure availability of roots over a longer period for food security and to supply commercial enterprises.

### What have we achieved so far?

CIP has provided the technical backstopping to sweetpotato breeders of DARS to;

- Acquire germplasm from other successful national and support breeding programs from which varieties have been developed
- Support the establishment of crossing blocks from where combining traits is done using locally selected parents and seeds are generated for variety development
- Support the implementation of breeding and other technology development experiments
- Build the capacity of national breeders through training on the application of speed breeding techniques, use of specialized software programs that facilitate routine breeding tasks such as planting trials and analyzing data. Breeders from both CIP and national programs meet yearly for training on the implementation of breeding programs, sharing experiences and successes. CIP has also created on line support services through the sweetpotato knowledge portal from where all scientists have free access to get information
- From the genepool facilitated by CIP, three new OFSP varieties have been released in Malawi in 2018 with agronomic attributes presented in Table 1. These varieties are suitable for different agro-ecological zones of Malawi including drought prone areas. They are suitable for household utilization for food and nutrition security. Further, the varieties have been tested and are good for puree processing for baked products (Fig.2).

### Who are we working with?

CIP engages with a number of international NGOs, national NGOs, and government partners as well as collaborating with on-going projects operating in similar regions of Malawi. For sweetpotato as well as potato, DARS with support from CIP leads the breeding research and germplasm maintenance of foundation material at the Bvumbwe Research Station. Other major implementing partners mainly on sweetpotato include non-governmental organisations (NGOs) namely, United Purpose, (UP, Thyolo and Chiradzulu), Catholic Development Commission (CADECOM, Chikwawa), Youth



Fig. 3 OFSP value added products (Credit F. Chipunga)

in Agriculture for Economic Development (YAED, Chiradzulu), Concern World Wide (Concern, Nsanje), Welt Hunger Hilfe (WHH, Chikwawa), Red Cross (Mulanje); Peace Corps Volunteers (nutrition, Bvumbwe), private partners such as Universal Industries Ltd (UIL) and Tehilah that have invested in developing commercial products for all three RTCs that include OFSP, cassava and potato crisps, OFSP and cassava biscuits, high quality cassava flour, and OFSP puree; all of which promote national expansion of nutritive foods comprised of roots and tubers (Fig. 3).

### What's next?

CIP is facilitating the cleaning of the newly released varieties in preparation for onward dissemination of high quality planting materials to multipliers and root producers. In partnership with other CIP projects, Feed the Future Malawi Improved Seed Systems and Technologies (MISST) has provided a growth chamber for the tissue culture lab to facilitate cleaning of varieties. In addition, a virologist from Kenya traveled to Malawi to train DARS and CIP staff on the use of the growth chamber and disease cleaning. While variety and technology generation on all RTC continues, CIP will engage partners to ensure adoption of the released varieties and support the commercialisation of these varieties.

Table 1 Newly released varieties of Malawi (2018)

Attribute	BV11/131	BV11/150A	BV11/172A
Breeding code number	BV11*/131	BV11/150A	BV11/172A
Given name	Royal Choice	Msungabanja	Mthetsanjala
Family (from Uganda)	Nasplot 1	New Kawogo	New Kawogo
Special traits	Big root size and smooth shape suitable for processing, widely adaptable, moderate to tolerant to SPVD, long shelf life after harvest	Big root size and smooth shape suitable for processing, widely adaptable, moderate to tolerant to SPVD, long shelf life after harvest	Big root size and smooth shape suitable for processing, widely adaptable, moderate to tolerant to SPVD, long shelf life after harvest
Growth habit	Spreading	Semi-erect	Spreading
Dry matter (%)	31	31	32
Time of maturity	4	4	4
Potential yield (t/ha)	35	30	30
Root flesh colour	Deep Orange	Deep Orange	Deep Orange
Root skin colour	Deep purple	Purple	Purple

### CONTACTS

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