

Integrating Orange-Fleshed Sweetpotato in Zambia (Oct 2011- Sept 2015)

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Fig. 6 Roots supplied by Kapiiri-Moshi farmers to Food Lovers, Lusaka (credit C. Mweenba)



Fig. 8 Mr. Champo, one of 30 farmers producing roots for lucrative dry season market (credit C. Mweenba)



Fig. 7 Launch of OFSP root sales at Woodlands Pic n' Pay in Lusaka (credit C. Mweenba)

commercial approach is no doubt best for building permanent willing-to-pay among rural sweetpotato producers, but the high uncertainty of the endeavour in the early years may have contributed to the high drop-out rate seen among trained vine multipliers (Table 1). It would be interesting to assess, however, in a few years, how many of those who continued to multiply for at least 2 years are still multiplying vines five years from now.

Development of small, medium and large scale processing: OFSP is an emerging commercial crop with a lot of potential uses for food, feed and industrial application. Exploiting these opportunities for value addition open up markets for the crop and promote its production. However, first, industries and entrepreneurs require more exposure and linkages with farmers to ensure sustained OFSP production and supply.

Up scaling Technology dissemination: After four years of technology development, OFSP is a known and liked commodity, poised for large-scale dissemination in Zambia if resources to support this materialize. If the improved OFSP varieties and the recommended practices are applied, there is high potential to get much better yields and increase gross profit margins. Greater emphasis needs to be paid to improving poor production practices, including low plant population per hectare due to large ridges which go up to 1.50 m apart instead of the recommended 1.00 m (Fig. 8). Extension services can play an important role in reaching farmers with information on effective OFSP integration into the farming system.

Partners

National:

- Zambian Agricultural Research Institute (ZARI)
- University of Zambia (UNZA)

In different districts:

- Agribusiness in Sustainable Natural African Plant Products (ASNAPP)
- Arulussa Farm Community Markets for Conservation (COMACO)
- Chipata District Multi-Sector Nutrition Committee (CDNMC)
- Care International
- CARITAS
- Catholic Relief Services – Mawa
- Conservation Farming Unit (CFU)
- Covenant College
- Development Aid from People to People in Zambia
- Every Home for Christ (EHC)
- Golden Valley Agricultural Trust (GART)
- HarvestPlus
- International Institute of Tropical Agriculture (IITA)
- Kenneth Kaunda Foundation
- Ministry of Agriculture and Livestock (MAL)
- Ministry of Community Development, Mother and Child Health
- National Food and Nutrition Commission
- Organic Producers and Processors Association of Zambia
- Peace Corps
- Rising Fountains Development Program
- Rural Initiative for Children's Hope Foundation (RICH)
- Women in Agri-business Sub-Saharan Africa Alliance (WASAA)

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By December 2014, we operated in 73 Agricultural Camps across six implementing districts of Eastern Province and Central Provinces, where 436 vine multipliers (97F, 328M) disseminated high quality planting vines to fellow community members. To date, the project has surpassed its goals, directly reaching 17,802 households with improved orange-fleshed sweetpotato (OFSP) and opening up market opportunities for commercially oriented producers.

What is the problem?

According to 2007 statistics (CSO et al., 2009), 48% of boys and 42% of girls under five years of age in Zambia are stunted. Moreover, micronutrient malnutrition is very high. In spite of Zambia having a vitamin A capsule supplementation program and fortified sugar (currently reaching 63% of children 6–9 months of age) the prevalence of vitamin A deficiency (VAD) among children under five years of age is 54%. Part of the challenge is that fortified foods are often beyond the purchasing power of many households, especially in rural areas.

Whereas food-based approaches focusing on vitamin A foods are a viable complement to supplementation efforts, Zambia has until now not invested in this strategy. However, promoting OFSP production and consumption in Zambia can provide not only energy, but also essential micronutrients, such as vitamin A, vitamin C, and several B vitamins and minerals to the diet. Varieties of OFSP with very high levels of vitamin A have been conventionally bred to combat VAD in many African countries. In Zambia, potential sweetpotato production is as high as 80 metric tons (mt) per hectare under irrigation with good fertility management and 30 mt/ha under rainfed conditions with excellent management.



Fig. 1 Promoting vine and root sales at agricultural fairs (credit C. Mweenba)

However, one of the challenges facing production is the lack of disease-free quality planting material. Yields can be significantly reduced by sweetpotato virus diseases (SPVD).

The Government is currently committed to achieving the nutrition-related Millennium Development Goals (MDGs) and is a member of the Scaling Up Nutrition (SUN) movement. In June 2013, it pledged to cut chronic malnutrition by half over the next ten years.

What did we want to achieve?

The four year project "Integrating Orange in Zambia: Combating Vitamin A Deficiency and Food Insecurity through the Effective Use of Orange-fleshed Sweetpotato in Eastern and Central Provinces" aimed to improve vitamin A and energy intake for at least 15,000 rural households growing and consuming OFSP, of which 75% should be women with children under 5 years of age. Supported under USAID's Feed the Future (FTF) initiative, it also sought to improve overall household food security and diet diversification through effective dissemination of pro-vitamin A rich OFSP varieties and improved production, conservation, and utilization techniques linked to increased nutritional knowledge.

❖ How did we make it happen?

We identified and strengthened partnerships that worked to promote OFSP adoption. They ensured access to OFSP planting material through the establishment of an active and knowledgeable sweetpotato community of practice among rural households. This community of practice focused on integrating and enhancing food security and dietary diversification, which ensured that women in particular benefited from OFSP-based nutrition and market interventions in the maize-dominated cropping systems. We implemented the following components:

- 1) Creation of partnerships with relevant government departments, NGOs, and other private sector players to implement the project.
- 2) Generation of high quality planting vines and establishment of an effective delivery system to rural households for increased OFSP productivity.
- 3) Provision of nutritional knowledge with particular reference to VAD, OFSP, child care and dietary diversification, especially to women in the beneficiary households.
- 4) Development of promotional and educational messages and their dissemination to the public through Nyanja and Bemba radio programs, dance, poetry, songs, field days and banners to create and sustain market demand for OFSP vines, roots, leaves and processed products made from OFSP.
- 5) Building capacity of national implementing partners to design and implement strong and cost-effective research, training and intervention activities that drive successful adoption and utilization of OFSP.



❖ Fig. 2 Map of Zambia with key project districts indicated by *

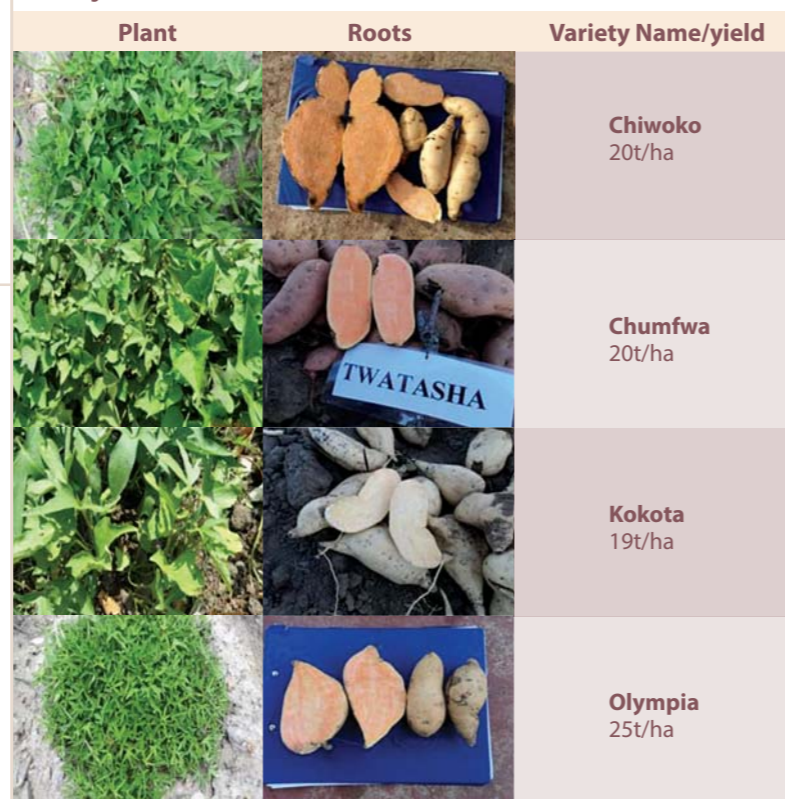
❖ Where and who did we work with?

Since 2011, the project focused on five districts in Eastern Province (Chipata, Katete, Lundazi, Nyimba, Petauke) and one district in Central Province, Kapiri-Mposhi, known for sweetpotato production that feeds into the Lusaka (the capital of Zambia) market (Fig. 2). The project was implemented by CIP in close collaboration with the Zambia Agriculture Research Institute (ZARI) and many other partner organizations (see list). The project was hosted by ZARI's Msekera research station in Chipata, Zambia.

❖ What have we achieved?

Development of improved OFSP varieties for Zambia in collaboration with Zambia Agriculture Research Institute (ZARI): High yielding and farmers' preferred varieties are the basis for increased productivity and sustainable development of any crop, including sweetpotato. In 2014, ZARI officially released four OFSP varieties namely Olympia, Twatasha (Chunfwa), Chiwoko (Orange Chingovwa) and Kokota (Fig. 3), which were widely tested with farmers during the project period. These varieties have a yield range of 19 t/ha (Kokota) to 25 t/ha (Olympia) against the overall national average of 5.8t/ha for sweetpotato.

❖ Fig. 3 OFSP varieties released in 2014 in Zambia

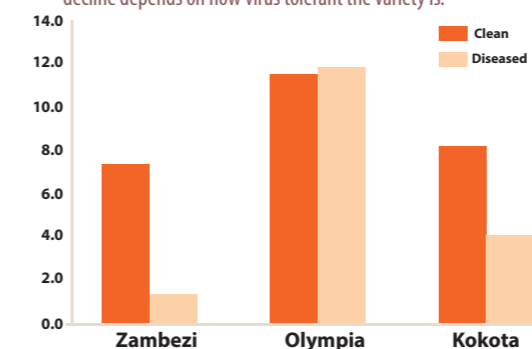


❖ Fig. 4 Sandponic pre-basic seed multiplication at Msekera Station (credit C. Mweenba)

Development of primary 'seed' source:

The critical entry point of reaching out to beneficiaries is availing the right, improved varieties and disease-free planting material. We made this possible through the establishment of accelerated, systematic and sustainable 'seed' delivery mechanisms. We used negative selection (removing vines with visible virus infection) to establish multiplication fields while varieties were being "cleaned up" at support platforms in Mozambique and Kenya. We received the disease-free, clean starter seed in April 2013. In addition, we developed a "sandponics" system for accelerated pre-basic vine multiplication in screen houses at ZARI Mansa and Msekera research centers to establish a permanent source of disease-free pre-basic planting material (Fig. 4). Since susceptibility to virus is variety specific, we monitored performance of each promoted varieties over seasons (Fig. 5).

❖ Fig. 5 Comparison of yields (tons/ha) of three varieties (Zambezi, Olympia, Kokota) during first season in the field ("clean" planting material) and several seasons in the field (exposed for to virus pressure). As viruses build up, yields decline. The rate of decline depends on how virus tolerant the variety is.



Sustaining production and dissemination of planting vines:

Multiplication and deployment of improved sweetpotato varieties necessitate development of seed delivery systems through a participatory approach involving key stakeholders. We disseminated rapid multiplication techniques (attaining rates of 90:1) to Zambian farmers. By December 2014, 436 (97F, 328M) Decentralized Vine Multipliers (DVMs) in 73 agricultural camps across the implementing districts had been trained on rapid vine

multiplication, disease control and nursery management. They were the primary beneficiaries of the screen house materials, and their role was to multiply and preserve disease-free planting vines within their communities for further dissemination and easy access by other growers. Over the project years and through CIP, partners and DVMs, 17,802 households directly received OFSP vines as 'seed' for planting (Table 1), covering a total of 38,523 children under five years of age. Each DVM was expected to provide 2-4 bundles of vines each to at least 100 households.

❖ Table 1. Progress in establishing DVMs and the number of farmer beneficiaries obtaining vines through purchase or free distribution.

Category	2012/13	2012/13	2012/13	Total
No. of new DVMs established	280	160	358	798
No. of continuing DVMs		160	78	238
No. of direct beneficiaries	1,898	5,296	10,608	17,802
% of beneficiaries who paid for their planting material	100%	100%	30%	

Awareness and demand creation:

Beyond technology dissemination to increase production and supply, consumer demand is essential for wider and sustained adoption of OFSP. To stimulate increased OFSP production, consumption and demand, we held nutrition awareness and education campaigns, formal trainings and field days using gender sensitive, community level, and mass media approaches. We trained a total of 26,098 individuals on OFSP technologies; 7,225 of these individuals were also trained on child health through clinics in their communities.

Linking farmers to supermarkets and traders:

To raise the income of rural farmers, we linked Kapiri-Mposhi OFSP farmers with Food Lovers (Levi Junction) (Fig. 6) and Pick and Pay supermarket (Woodlands and Makeni) suppliers in Lusaka (Fig. 7). Apart from supermarkets, farmers are also linked to Mandevu and Soweta market vendors in Lusaka. Farmers are now engaged in dry season production for consistent supply of roots in the markets (Fig. 8). The majority of the sweetpotato traders along the Great East and North roads as well as retailers in local markets are women. We made particular efforts to train female vine and root traders to carry out profitable businesses and use their income for the benefit of the families. We supported roadside sellers with signs and decorated marketing stalls in Lusaka and key towns in our catchment area.