Sweetpotato Seed Systems and Crop Management Community of Practice

SPHI
Sweetpotato for Profit and Health Initiative

Regional Technical Support Platform for East, West, Central and Southern Africa

Fifth Consultation: Marketing Strategies for Quality Sweetpotato Seed

Corridor Springs Hotel - Arusha, Tanzania

May 10 -12 , 2016

Compiled by Christine Bukania; edited by Margaret McEwan

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Cover photo: *Sweetbart Bushaijabwe, the nursery manager at Crop Biosciences Ltd., demonstrates to members of the Seed Systems and Crop Management CoP how Vapour Guard is used to protect sweetpotato cuttings from moisture loss before transportation to the customer(Credit: C. Bukania)*

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Acronyms

AGRA	Alliance for a Green Revolution in Africa
ASA	Agriculture Seed Agency
BMGF	Bill & Melinda Gates Foundation
CBS	Crop Biosciences Solution
CIP	International Potato Center
CoP	Community of Practice
CSE	Cassava Seed Entrepreneurs
DVM	Decentralised Vine Multiplier
FCI	Farm Concern International
ICT	Information and Communication Technology
IITA	International Institute of Tropical Agriculture
IPDM	Integrated Pest and Disease Management
KEPHIS	Kenya Plant Health Inspectorate Service
MEDA	Mennonite Economic Development Associates
MMB	Muhogo Mbegu Bingwa
NaCCRI	National Crops Resources Research Institute
NARI	National Agricultural Research Institute
NARS	National Agriculture Research System
OFSP	Orange-fleshed Sweetpotato
QDPM	Quality Declared Planting Material
QDS	Quality Declared Seed
SASHA	Sweetpotato Action for Security and Health in Africa
SeFaMaCo	Seed-Farmer-Market-Consumer
SEMaD	Seed Marketing Enterprise Development
SHF	Small Holder Farmer
SOSSPA	Sweetpotato Producers and Processors Association
SPHI	Sweetpotato for Profit and Health Initiative
SPVD	Sweet potato virus disease
SSA	Sub-Saharan Africa
TAHA	Tanzania Horticultural Association
TAHEA	Tanzania Home Economics Assoiciation
TARI	Tigray Agricultural Research Institute (Ethiopia)
TOSCI	Tanzania Official Seed Certification Institute
VEDCO	Volunteer Efforts for Development Concerns

Executive summary

The fifth consultation of the Sweetpotato Seed Systems and Crop Management Community of Practice (CoP) was held from 10 to 12 May 2016 in Arusha Tanzania. The meeting, which was officially opened by Dr Kiddo Mtunda (Officer-in-Charge, Sugarcane Research Institute, Kibaha, Tanzania) was attended by participants from 11 countries: Ethiopia, Kenya, Uganda, Tanzania, Ghana, Nigeria, Burkina Faso, Malawi, Mozambique, Nigeria and Zambia.

The objectives of the meeting were to (i) share experiences from the public and private sector on marketing strategies for quality seed; (ii) share updates on delivery system projects; and (iii) discuss seed system technologies such as fertiliser for vine production, sandponics, and Triple S; and crop and seed management issues. The following is a summary of the presentations and group activities that took place:

Session 1: Marketing strategies for quality sweetpotato seed

Keynote: Commercially sustainable, quality assured cassava seed system in Tanzania - a pilot innovation project: Peter Pacific (MEDA): The Muhogo Mbegu Bingwa (MMB) project aims to advance understanding and acceptance among stakeholders of the scope for using, and how to use, market-based methods to enable small farmers to obtain high quality cassava seed. Local cassava seed entrepreneurs (CSEs) were supported to commercialise cassava seed production and share the lessons emerging from various business models. The implementation model ensures cost sharing as a way of fostering commitment and ownership by CSEs. Several lessons regarding production, cost drivers and the sustainability of the private multiplier supply chain have been identified. Key among them is that in commercial and Quality Declared Planting Material (QDPM) models labour accounts for most of the production costs.

Marketing strategies in the informal supply system of sweetpotato seeds in Uganda and Tanzania - commercialising clean sweetpotato seeds in areas with a long dry season: Stephen Kalule (University of Gulu): In Tanzania, vines are produced by few but relatively large-scale producers, who mostly sell on-farm. Conversely, in Uganda, production takes place among many small-scale producers. Vine multipliers have steadily increased in Uganda since 2013.They are being supported to improve vine marketing, through innovations such as use of mobile phones, a platform that brings together multipliers and street sellers, and the use of banners.

Seed-Farmer-Market-Consumer: the SeFaMaCo Model: Harold Mate (Farm Concern International): Farm Concern International (FCI) is implementing the four-level model that focuses on market development in four countries – Uganda, Tanzania, Ethiopia and Rwanda. In all these countries the traditional informal system dominates the sweetpotato seed distribution channels, and it is ineffective in reaching farmers with high quality material. To address this, the initiative aims to turn existing seed multipliers into entrepreneurs with each seed multiplier supporting three Commercial Villages with clean and quality seed.

Sweetpotato seed marketing strategy: Wilfred Mushobozi (Crop Biosciences Solutions): Crop Biosciences Solutions (CBS) aims to create a premium positioning for clean sweetpotato seeds for commercial producers of sweetpotato; and to increase overall consumption of orange-fleshed sweetpotato (OFSP) in Tanzania. Through partnership with the Tanzania Horticultural Association (TAHA), who have secured an export market, demand for clean sweetpotato

planting material has been boosted. CBS is also implemeting a marketing strategy that will improve demand for clean plantingmaterial on the local market.

Group work: Improving our marketing strategies: Five groups were constituted to to analyse the projects which had been presented to (i) identify three marketing strategies that worked, why they worked and what could make them better (ii) Identify other strategies and their merits; and (iii) come up with action plans for marketing sweetpotato seed in their countries. After the discussion, each group presented their findings to the plenary.

Session 2: Novel methods and new findings

Novel delivery strategies for sweetpotato seed - experiences from the Fast Track project - Keynote by Kiddo Mtunda (SRI-Kibaha): The Fast Track project aims to speed up the dissemination of improved varieties by using rural school children as a rapid dissemination channel to households. Each household that receives vines is expected to share them with two other households within six months. Although the project started small, to date, a total of 647,002 vine cuttings were disseminated to over 6,000 households through 35 schools in Tanzania and Uganda. The project has also made achievements in improving gender-responsiveness, training on general agricultural practices, communication and advocacy and nutrition education.

Competitiveness of Ugandan bred OFSP varieties and key emerging seed system innovations - Charles Musoke (HarvestPlus): While the seed industry in Uganda is generally characterised by a formal and informal sector, sweetpotato belongs to the transitional seed system. Research shows that 89 percent of sweetpotato seed is obtained from the informal seed system. The research also found that the available seed is not sufficient. The idea of using clean start-up material from tissue culture is novel in Uganda. Efforts have started to lay the groundwork for enhancing quality along the seed value chain, and the foundation for piloting formal inspection protocols in select districts has been laid.

Sweetpotato Commercialisation in areas with longer dry season of Uganda and Tanzania - Everina Lukonge (Lake Zone Agricultural Research Development Institute): The goal of the project is to enhance the capacities of vine multipliers to provide more healthy planting material of improved varieties and superior landraces to sweetpotato farmers. Production of vines is done through two methods, mono purpose (vines only) and dual purpose (vines and roots). Fertiliser has been found to be useful in boosting vine production. Out of the two methods, fertiliser application doubles profitability of the mono purpose method than dual purpose production. Combining organic with the inorganic fertiliser may make production even more profitable but this will depend on the local costs of manure.

Effect of nitrogen and phosphorus on sweetpotato root production under Guinea and Sudan savanna agro-ecological zones of Ghana - Abukari Alidu Issah (Council for Scientific and Industrial Research-Savanna Agricultural Research Institute): The objective of this study is to investigate the interactive effect of levels of nitrogen and phosphorus on sweetpotato growth, development and yield in Guinea and Sudan savanna agro-ecological zones of Ghana. The study locations are Nyankpala and Bawku. In comparison with the untreated check, when nitrogen and phosphorus were applied at their highest rates, fresh storage root yield per hectare increased by 11% and 15% respectively at Nyankpala and by 37% and 50% respectively at

Bawku. The data from this study indicate that the maximum level of nitrogen and phosphorus for optimum yield was not reached in this test.

"100 best bet": sweetpotato varieties for Sub-Saharan Africa - Robert Mwanga (CIP): Over the years, breeders released many OFSP varieties across the continent. In order to rationalise the use of resources, the Sweetpotato Action for Security and Health in Africa (SASHA) project embarked on an initiative to identify varieties that had to be systematically conserved for use by national programs. These varieties, dubbed "100 best bet" have special traits. They are unique in that they possess important and desirable characteristics such as dry matter, beta carotene, drought tolerance, weevil tolerance etc. The selected varieties will be cleaned up and maintained in tissue culture and screen house at Kenya Plant Health Inspectorate Service – Plant Quarantine and Biosafety Station (KEPHIS PQBS) in Muguga, and will be distributed to countries on request at a small charge.

Session 3: Learning journey: good agronomic practices for commercial root production

TAHA OFSP commercialisation initiative in Tanzania - Jacqueline Mkindi (TAHA): TAHA works to ensure that the agricultural environment is conducive for farmers, through technical support, advocacy, access to markets and trade facilitation. TAHA decided strategically to prioritise and commercialise OFSP due to the crop's nutritional values and economic potential. In 2015, a market relationship was established with a company in Israel, which is a major producer and distributor of horticultural products to European countries. As part of the contract, TAHA is testing three varieties that are in high demand. The results have been positive. The next steps are to mobilise resources and partnerships to establish the business, establish a nuclear farm and build outgrowers clusters according to the plan. TAHA is also sourcing resources to build processing facilities for curing, grading, sorting and packaging.

Learning route to CBS and TAHA: To prepare for the learning journey, four groups were formed, based on the learning objectives. These groups were as follows: (i) Good agronomic practices for commercial root production; (ii) Business case for root production; (iii) Sweetpotato seed marketing strategies; and (iv) Good practices to increase tissue culture multiplication rates to reduce cost. They discussed and agreed on the learning objectives, priority questions and protocol during the visit. After the visit, all members gave highlights and key learning points from their perspective, documented their reflections and noted the implications of their visit for different types of farmers (women, youth, and resource poor). Group members identified up to three action points coming out of the visit that they would personally act on within their own work or institution

Parallel working group sessions on good seed production practices: The following working groups held their consultations and reported back to the plenary (1) Triple S; (2) Sandponics; (3) Screen house, tissue culture conservation and micro-propagation; and (4) Agronomy and crop management for sweetpotato seed. After proposing possible topics for online discussions, the following topics and moderators were selected:

- Value addition to sweetpotato seed for shelf-life improvement, branding, packaging, etc. (Rogers Kakuhenzire)
- Linking of key actors in the sweetpotato seed value chain (Wilfred Mushobozi)
- Fast tracking the seed certification process (Bramwel Wanjala)
- Free seeds distribution: opportunity or illusion? (Some Koussao)

Opening, introductions and objectives of the meeting

Group photograph of participants

The fifth consultation of the Sweetpotato Seed Systems and Crop Management CoP was held from 10 to 12 May 2016 in Arusha Tanzania. The meeting, which was officially opened by Dr Kiddo Mtunda (Officer-in-Charge, Sugarcane Research Institute, Kibaha, Tanzania) was attended by participants from national sweetpotato research programmes in 11 countries: Ethiopia, Kenya, Uganda, Tanzania, Ghana, Nigeria, Burkina Faso, Malawi, Mozambique, Nigeria and Zambia. Development partners, private sector actors and colleagues supporting cassava seed enterprises. The objectives of the meeting were to:

- Share experiences on marketing strategies for quality seed: Different seed system value chain players from the public and private sector working on sweetpotato and cassava shared experiences and lessons.
- Share updates on delivery system projects.
- Discuss seed system technologies such as fertiliser for vine production, sandponics, and Triple S; and crop and seed management issues.

To promote learning and networking, participants went on a learning journey to the Crop Biosciences Ltd. Tissue culture laboratory and to a pilot farm run by TAHA supported sweetpotato export initiative. Participants were also given an orientation on the use of the Sweetpotato Knowledge Portal. In efforts to continue building the CoP.

Session 1: Marketing strategies for quality sweetpotato seed

1.1 Keynote: Commercially sustainable, quality assured cassava seed system in Tanzania - a pilot innovation project

Peter Pacific - MEDA

Mennonite Economic Development Associates (MEDA) is an international economic development organisation whose mission is to create business solutions to poverty. Founded in 1953 by a group of Mennonite business professionals, it partners with the poor to start or grow small and medium-sized businesses in developing regions around the world. The head office is in Waterloo, Canada. In Tanzania, MEDA is implementing the following projects:

a) Muhogo Mbegu Bingwa Project – Cassava Seed System project
b) The Strengthening Small Business Value Chains project
c) Mafuta Asili ya Alizeti yenye Vitamin A / Food Fortification Project
d) Hati Salama Project (Secure Voucher test: To Enhance the Use of Electronic Voucher to Test Demand & Behavioural Change)

1.1.1 Muhogo Mbegu Bingwa project

The MMB project was established to address certain problems in the existing distribution methods for quality cassava seed. The table below shows the challenges that were faced with each distribution method.

Table 1: MMB project: current distribution methods and challenges

Current distribution methods	Challenges
Reuse of saved planting materials	Reduce production, spread of diseases
Close friends and relatives	Not a reliable source, spread of diseases
Informal farmer to farmer	Not reliable, spread of diseases
Donor sponsored programmes	Time-based programme, fixed budget not sustainable
National sponsored programmes	Not sustainable, budget constraint

To respond to these problems, a new cadre of local CSEs was identified and trained. These provide to farmers a consistent supply of certified cassava planting material of new and improved varieties, responding to local preferences and selling at prices that are affordable to the farmers, and sustainably profitable to the entrepreneurs. The goal is to advance understanding and acceptance among stakeholders of the scope for using, and how to use, market-based methods to enable small farmers to obtain high quality cassava seed.

The project is being implemented from June 2012 to December 2016 in the following locations:

- Southern Zone (Mtwara, Lindi and Coastal Region)
- Lake Zone (Kagera, Mwanza and Mara)
- Central Zone (Dodoma and Tanga)

The project partners include the International Institute of Tropical Agriculture (IITA), the National Agriculture Research System (NARS), the Tanzania Official Seed Certification Institute (TOSCI) and the Agriculture Seed Agency (ASA).

The project has four key specific objectives

1. Business planning, cost modelling, and implementation planning for the market viability of the a commercially sustainable cassava seed supply chain - Plan
2. Facilitate and support commercial cassava planting material production, and marketing of pilot supply chain models - Do
3. Design and test, in partnership with the government seed regulatory agency a rigorous seed quality monitoring and certification protocol that is affordable to the all levels in the supply chain - Validate
4. Learning – analysis of issues that constrain development of seed systems that leads to course corrections - Share

1.1.2 Implementation model

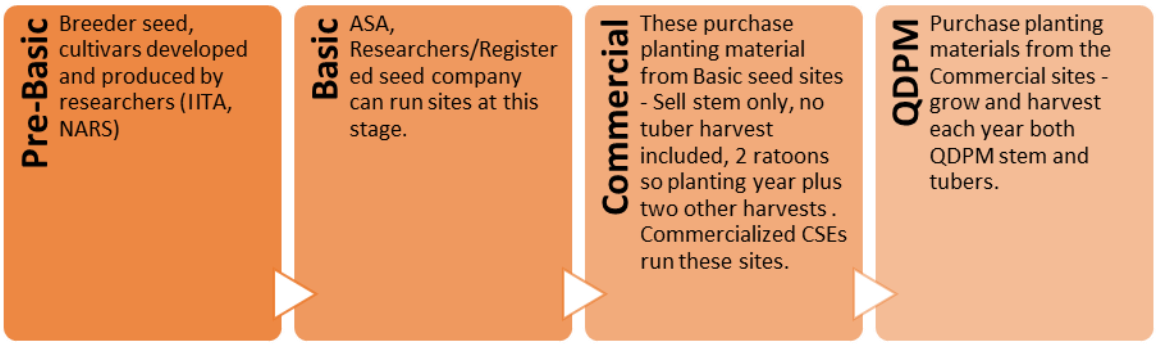
The figure below illustrates how the implementation model works. MEDA plays a facilitation role in establishing seed multiplication sites but does not own or manage the sites. Cost sharing is done so that the farmer-entrepreneur shows commitment to the business and shows proof of ownership of the business. It also covers the incentive for the entrepreneur to plan for their business. They are supported through mentoring and coaching.

Figure 1: MMB implementation model

1.1.3 Cassava seed system

The levels of the seed system are as follows:

Figure 2: Cassava seed system



1.1.4 Challenges on commercialisation of seed system

These are the four most important challenges in commercialisation of cassava seed system

1. CSE selection - Cultural/mind-set shift from casual farmer to entrepreneur who takes ownership. Distance is also a problem as it leads to isolation.
2. CSE management - Model of monitoring and training on business and cassava seed growing not a one-time activity, requires significant follow-up and mentoring – expensive!
3. Certification process and cost - TOSCI inspection is centralised, which is too expensive for many CSEs. It needs to be decentralised.
4. Demand for quality assured cassava - Low demand especially for the areas with low disease pressure e.g. Tanga.

1.1.5 Drivers for business success-lessons

a) Stakeholder Collaboration

Involving local leadership creates acceptance: From project start-up through implementation, leveraging government structures enables information dissemination, acceptance in the local area and outreach. Their influence creates demand and facilitates conflict resolution. Important seed system partners such as TOSCI should be involved early in the project as they play a crucial role in the project's success.

Coordination with district authorities: District level relations can help to encourage policy decisions that create the ideal market conditions, such as the choice not to conduct free giveaway schemes, discouraging farmers from recycling planting material and providing extension staff for continued CSE support.

Coordination with aligned projects creates sustainable market linkages: Sites should be established where there is presence of other projects to drive up demand.

b) Field Establishment and Management

Start with the right entrepreneurs: Establish a recruitment process that seeks entrepreneurs who are actively looking for market opportunities to move their product forward.

Right business model: Committed entrepreneurs would have an invested interest in maintaining quality and accuracy in their farming.

Right business and agronomic processes: This includes proper disease management through monitoring and tracking guarantees value.

Clean Material: Ensuring the availability of clean start-up materials is essential to creating a differentiated value proposition. For example, in Lake Zone, CSEs started with materials that were tested in the laboratory. As a result there have been no disease symptoms to date.

c) Training and Capacity Building

Fostering entrepreneurial farmers with a strong understanding of the business model and value offering is important: This can be achieved by providing the tools to be successful e.g. education on business and agronomy best practices; ensuring the understanding of the products value proposition; emphasising the importance of marketing and sales and the correlation between quality, quantity and profit.

Workshops provide a good foundation but fall short: Continued monitoring is especially necessary in disease management and ensuring quality. Support in accurate reporting helps the entrepreneur to better understand their business model.

d) Marketing and Promotion

Conveying value to farmers through marketing can be cost-effective: Use of public and social gatherings effectively reaches people faster and at a low cost. Word of mouth, promotional flyers and roadside signs help to generate interest, while radio programs and farmers show creates more awareness and demand.

Local leadership and networks assist in generating demand: Local leaders have been key in influencing farmers to buy cassava seeds. Creating market linkages with processors helps generate demand for clean stems and agricultural extension officers have helped to promote stems in their networks.

Establishing a sales pipeline in advance ensures greater success: Entrepreneurs need to continually focus on generating and following up with sales leads.

Proving value proposition is the next step: The product is still new. Demonstrating value through demonstration plots and small-scale research projects is MEDA's next step in supporting marketing efforts of the commercial cassava seed system.

Business model analysis

Several lessons regarding production, cost drivers and the sustainability of the private multiplier supply chain have been identified:

- Initial start-up costs for land preparation, including clearing and de-stumping, are high due to their labour intensive nature (accounting for 21% and 35% of total operating costs in commercial and QDPM models, respectively). These high costs are a barrier to new entrants.
- The business models are generally labour intensive, with the cost of labour averaging Tsh. 7,500 a day. Sixty-three percent of the operating costs in the commercial model and 75%

of those in the QDPM are spent on labour for activities such as weeding, harvesting and field management.

- As anticipated, expenditures for input materials are higher in the commercial model than the QDPM (31% versus 23%).
- Productivity in both models was lower than anticipated (71% and 62% in the commercial and QDPM models respectively). This is attributed to lower than recommended initial stem plantings, low rainfall in the Central Region and lack of adherence to the recommendations on fertiliser use.
- Even without MEDA's subsidy, CSEs in both the commercial and QDPM models were marginally profitable. The true return on investment for these models will be demonstrated over time, after initial start-up costs are amortised and absorbed in the subsequent years' revenue.

1.1.6 Summary of discussion

Sustainable access to credit for the CSEs: The MMB project is being supported through capacity building efforts, to ensure that it is in a position to link farmers to credit providers.

Peter Pacific elaborates a point from his presentation to participants (C. Bukania)

The difference between the two models: The commercial business model has not focussed on basic seed, but only on Certified 1 and Certified 2. Basic seed is produced by the ASA, researchers and registered seed companies.

Outlets for cassava seed: Certified commercial multipliers sell to QDPM multipliers. They know the number of acres these multipliers have and therefore are able to estimate the demand. QDPM multipliers then sell to the farmers for tuber production farmers. Marketing and sensitisation is done through meetings and radio announcements. QDPM seed must be sold within their wards.

How the start-up costs are funded: Farmers prepare their own business plans, which include the production cost. Therefore, the determination of start-up costs is based on these plans. The proportion of contribution from MEDA is agreed upon and outlined in a Memorandum of Understanding between MEDA and the entrepreneur.

1.2 Marketing strategies in informal supply system of sweetpotato seeds in Uganda and Tanzania: commercialising clean sweetpotato seeds in areas with a long dry season

Stephen W. Kalule, R. Gibson, D. Phillips, W. Mushobozi, Y. Obong, G., Rwegasira & E. Lukonge

In Tanzania, vines are produced by few but relatively large-scale producers. They sell largely on-farm. For instance in the Lake Zone, records show that 4,671 buyers accessed vines on-farm and only 292 buyers accessed vines on the market. Conversely, in Uganda, production takes place among many small-scale producers (acreage between 0.25 and 0.5). They sell to farmers at UGX 500 per small bundle, and to traders at UGX 300 per bundle. When they deliver to markets, they target street sellers with large bundles, which cost UGX 6,000. The number of vine multipliers has been increasing since 2013.

Stephen Kalule making his presentation

1.2.1 Marketing strategies

Street sellers target two markets: smallholder farmers in rural areas neighbouring Gulu town; and farmers from long distances e.g. Kitgum, Pader districts and South Sudan. Selling takes place throughout the planting season (May – October). The prices are relatively stable throughout the season (i.e. UGX 500 per small bundle). At Ombatin Junction in Arua, the market is a little different, with few vine traders selling large volumes.

1.2.2 New innovations

A platform bringing together multipliers and street sellers for improved communication: The multipliers would deliver vines to street sellers but sometimes they would not be ready to receive them. The vines would wilt, and reduce their quality as planting material. Sometimes, the street sellers would sell vines and default on paying the multipliers.

Introduction of mobile phones: Mobile phone communication will help multipliers to harvest vines only after they have received confirmation of the demand in the market. It will allow root farmers and vine sellers to contact multipliers easily. Mobile phones can facilitate transactions using mobile money, which is convenient and cost-effective, and promotes saving among multipliers without bank accounts.

Erecting banners in strategic places in town: Banners provide information about the vines being sold and the contact details of multipliers.

1.2.3 Summary of discussion

Number of people per group: The project does not work with groups, but with individuals who are in the market place as informal sellers. The project is trying to build them up to undertake sustainable businesses.

Pricing of vines: There is no pricing difference per variety and generally, the prices are relatively stable. Street sellers are targeted with big bundles, each having 20 small bundles. The buyers are knowledgeable about bundles and know what to expect. Multipliers give discounts, and

sometimes, even though they know that they are getting short-changed, they are quite happy to sell at half-price, because they understand that this is the cost they have to pay for getting a bigger market share.

Mobile money transaction costs: Usually, with mobile money, there are some costs incurred when sending and receiving money. The established norm is that the sender (customer) bears the cost of transaction to ensure that the seller gets the actual amount s/he sold the vines at.

Ensuring circulation of quality vines: As a result of awareness creation, buyers know the external appearance of unhealthy vines. In Northern Uganda, there is little spread of diseases. Although flushing out is done, it is not the answer to everything. At the district level, plant protection staff are involved in the project.

Challenges of vine selling by street sellers: The challenges include wilting of vines. This is partly being resolved by the use of mobile phones so that the multiplier, sellers and customer agree in advance on the time for delivery.

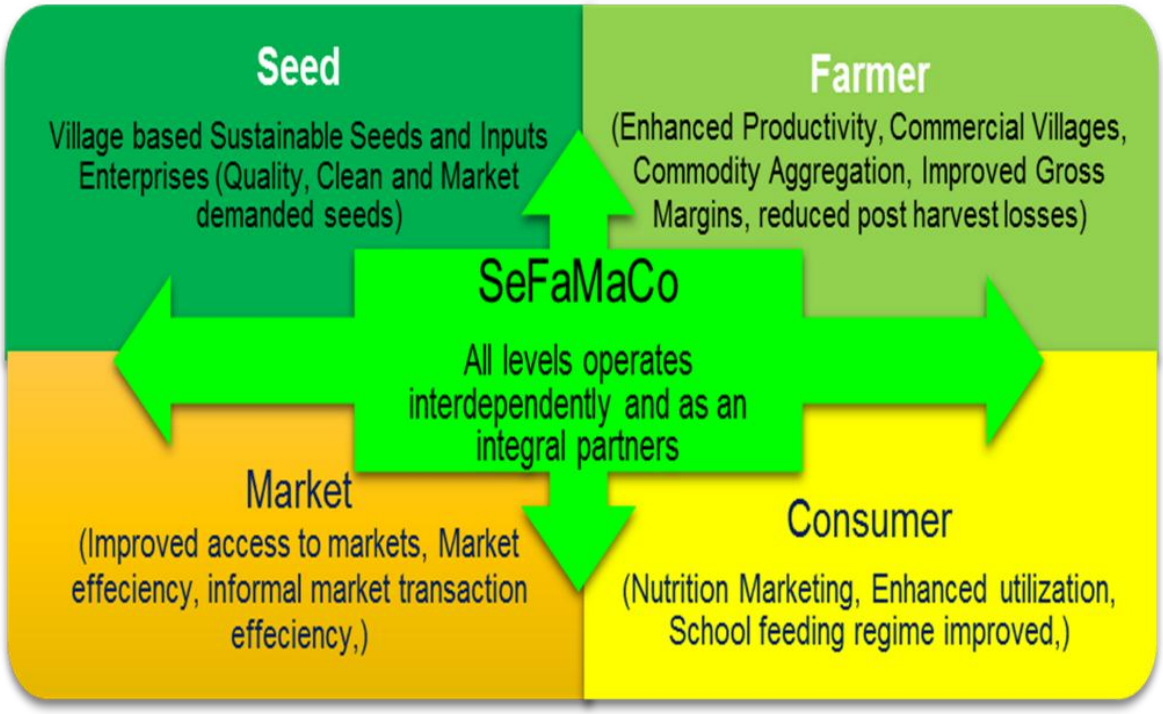
Topic to be carried forward: There is need to explore further whether planting vines during dry season in wet areas is feasible and whether it compensates the farmer.

1.3 Seed-Farmer-Market-Consumer: The SeFaMaCo Model

Harold Mate

SeFaMaCo is a four-level approach targeting four countries – Uganda, Tanzania, Ethiopia and Rwanda. The figure below shows the different levels.

Figure 3: The SeFaMaCo model



1.3.1 Outcomes focus of SeFaMaCo

1. Enhanced strategic investments in commercial seed enterprises responsive to market driven.
2. Clean and quality sweetpotatoes purchased by Small Holder Farmer (SHF) – Seed Marketing Enterprise Development (SEMaD) approach.
3. Commercialised SHF through Commercial Village Model for increased productivity and yields of market preferred varieties of sweetpotato, strengthened farmers' organisations for collective marketing and inclusion of youth and women as value producers.

Harold Mate responds to questions after his presentation

4. Increased market share of sweetpotato through enhanced value chain efficiency, market partnerships and competitiveness in informal traditional markets and schools as demand catalysts for other distribution channels.
5. Increased utilisation of sweetpotato through positive image building, product diversification, nutrition education and enhanced consumer preference in rural and urban areas.
6. Enhanced learning networks strengthened through strategic alliances and partnerships based on an upgraded SeFaMaCo model.

1.3.2 SeFaMaCo sweetpotato sites

The project is working in the following sites:

- Tanzania: Mwanza (Sengerema, Buchosa and Ukerewe – in partnership with Tanzania Home Economics Assoiciation –TAHEA); Geita (Geita and Nyang'hwale); Morogoro (Gairo and Kilosa); and Zanzibar – in partnership with UWAMWIMA
- Uganda: Soroti – through Sweetpotato Producers and Processors Association (SOSSPA), Serere, Ngora, Bukedea, Kumi, Kamuli, Jinja, Iganga, Buyende, Luwero – in partnership with Volunteer Efforts for Development Concerns (VEDCO)
- Ethiopia (SNNPR): Wolaita, Sidama, Gamo Gofa

1.3.3 The ongoing interventions

- Seed system profiling and identification of potential entrepreneurs: When developing such a system, it is important to profile and determine who can become an entrepreneur, so as to ensure sustainability through profitability. In addition, it requires analysis of seed demand, potential linkages, potential private sector partners.
- Formation of commercial village trade blocs across all the districts for supply chain coordination and market access platforms.
- Market research and building business partnerships with informal market actors, formal markets and institutional buyers: Relationships are built with wholesale and institutional buyers, which pushes up demand that subsequently feeds into the seed system.

- Development of consumer messages on 'Eat Potato Campaign'[1] materials development: Tanzania and Uganda is more advanced with regard to consumption, but in Ethiopia, sweetpotato is still not an established part of the diet. Therefore, the right messaging could help expand the market.
- Agri-investment networks and learning framework development.

1.3.4 Specific objectives of the enterprise model

Rather than focus on the science of sweetpotato, SeFaMaCo focuses on market development. The project's objectives, which are outlined below, reflect this focus:

- To build the capacity of seed and root entrepreneurs into profitable and sustainable businesses in the target regions through provision of relevant business skills;
- To enhance access to affordable clean and market demanded seed for smallholder farmers through a well-structured seed distribution system;
- To create private sector partnerships as a catalyst for OFSP seed market development and business development services support for seed enterprises and community groups;
- To expand the market for OFSP seed produced by seed enterprises and community groups through innovative promotional and awareness creation strategies;
- To establish a learning platform through collection of business enterprise performance data.

> ***Carry Forward Question**: Should we provide free seed to farmers or is this breaking the value chain?*

The project is expected to achieve the following outputs:

- Business skills and market development knowledge of seed entrepreneurs and farmer organisations in multiplication of quality planting material, distribution and marketing strengthened;
- Linkages with village seed supply and distribution systems (farmer organisations and farmer groups) initiated, expanded, and scaled up;
- Private sector partners profiled and linked to seed enterprises and community groups;
- Awareness created on the value of new OFSP varieties for health and wealth and on varieties with high yield and dry matter;
- Employment opportunities created for women and youth through upstream and downstream enterprises.

1.3.5 Critical facts

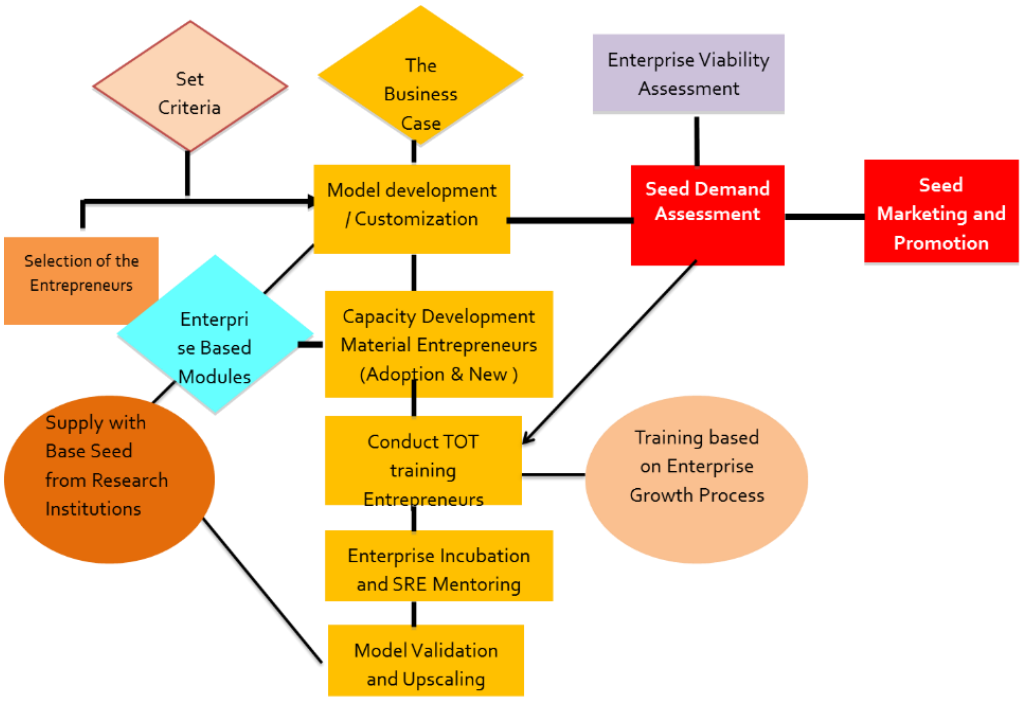
Sweetpotato breeding has been going on in the three countries for several decades. In Tanzania, various breeding efforts have led to the release of 12 varieties including OFSP. The national sweetpotato research program in Uganda has released 21 sweetpotato cultivars. In Ethiopia, 24 sweetpotato varieties have been released through the public research system.

[1] It was noted that there is a confusion in terminology – with sweetpotato being called "potato" in Uganda.

In all the three countries the traditional informal system dominates the sweetpotato seed distribution channels. These informal multiplication and distribution systems are underdeveloped and generally ineffective in reaching farmers with high quality sweetpotato planting material.

In Tanzania**,** analyses in different villages indicate that seed enterprises are generally profitable (about USD 485.12 per acre) but a higher profit margin is attained in a dual enterprise that combines seed and root production (about USD 1,435/ acre). In Uganda, sweetpotato vine multiplication is becoming profitable for some farmers, who grow a multi-purpose crop where they also sell the roots, making between USD 800-1,200 per acre of land. In Ethiopia, the analysis was based on projections in optimal conditions which realised a huge profit of about USD 4,669.

Figure 4: SeFaMaCo's Enterprise Model



1.3.6 The seed enterprise development

The focus of this initiative is on turning existing seed multipliers into entrepreneurs with each seed multiplier supporting three Commercial Villages with clean and quality seed. SeFaMaCo is also creating synergy with various Bill & Melinda Gates Foundation (BMGF), government or other donor funded programmes to ensure linkage to other ongoing seed systems efforts.

1.3.7 Summary of discussion

Approach for analysis of seed demand: The landscape analysis used Focus Group Discusions. This may not be conclusive but it demonstrates the level of demand.

Seed or sweetpotato enterprise: The main goal of the seed entrepreneur is to provide quality seed of adequate quantity. Roots are an added benefit.

Profit margin differences: In Ethiopia, sales are targeted to NGOs so this is an outlier. Looking at the ideal enterprise would bring different results.

1.4 Sweetpotato seed marketing strategy

Wilfred Mushobozi

CBS marketing strategy for sweetpotato vines seed has two key objectives: To create a premium positioning for clean sweetpotato seeds for commercial producers of sweetpotato; and to increase overall consumption of OFSP in Tanzania.

To achieve these objectives, CBS collaborates with different partners. The International Potato Center (CIP) helps to facilitate the tissue culture multiplication of virus indexed plantlets and multiplication in screen house. The screen house is visited and samples taken and tested at MARI (Mikocheni Agriculture Research Institute) laboratory to confirm that the plantlets are disease free. After that, they are delivered to commercial root producers, usually with between five and ten hectares of land.

Wilfred Mushobozi makes the presentation

TAHA is the main partner linking commercial root producers to the export market. The client requires that the producers should attain a yield of between 35-40 tonnes per hectare. To achieve this yield, they have to use clean seed. The client also requires that the root producers do not reuse planting material. These two requiremenets ensure that there is a ready market for clean seed.

Prior to transportation, CBS treats the cuttings with anti-fungal, and an anti-evaporation material called *Vapour Guard* to protect the cuttings from moisture loss and thus extend the potential "storage" period before planting.

1.4.1 Creation of demand

TAHA the main partner for the export market, has demand for low dry matter varieties. Currently, CBS supplies planting material for Jewel, Kabode and Mataya varieties. For local demand creation, branded vendor kiosks are used to display the different varieties of vines and roots.

> *A poem was performed at a community event where the district commissioner was present. When he was transferred to a district with high malnutrition, he recalled the message of the poem and called CBS to order for 35,000 Generation 1 cuttings. It is a bylaw for every household in that district to have OFSP plots.*

1.4.2 Key challenges

The sweetpotato industry in Tanzania is still dominated by relatively small-scale farmers with less than 1 ha of land. Furthermore, the demand for sweetpotato seed is unpredictable. Consequently, it is difficult to estimate demand and supply seed it is required at short notice.

The suggested way forward is as follows:

- Vines market forecast information is critical (*what the market is looking for at a particular time*);
- Linking vines multipliers with a source of clean starter materials (*i.e. Early Generation Seed*);
- Encouraging more investment in sweetpotato vines production to tap into emerging markets;
- Backing extension staff, communities, and NGOs to promote business oriented vine production and marketing;
- Integrating financial and credit services for vine producers to expand their business;
- Information and Communication Technology (ICT) platform for market access to clean vines.

1.5 Group work: Improving our marketing strategies

Five groups were constituted to hold discussions for 1.5 hours on the above mentioned theme. The groups were required to analyse the projects which had been presented to (i) identify three marketing strategies that worked, why they worked and what could make them better (ii) Identify other strategies and their merits; and (iii) come up with action plans for marketing sweetpotato seed in their countries. After the discussion, each group had ten minutes to make a presentation of their findings to the plenary.

1.5.1 Group 1

Marketing strategies that worked

- Vendor kiosks showcasing products, varietal differences
- Use of ICT linking seed producers and root and tuber producers
- Use of local leaders as champions for marketing i.e field days

Why they have worked

- Displays varietal differences
- Limits wastage by ordering vines after confirming the needed quality
- Incorporation of stakeholders in the seed value chain
- Ability to showcase value addition of end products

Some members of Group 1

What could be adapted to make them better

- Media engagement
- Availing information in the kiosk beyond the showcased products i.e technical advice
- Incorporating existing seed multipliers who can run the kiosk
- Integrating concepts in the existing systems i.e. markets

Other strategies used

- Using media to advertise and promote products
- Creating awareness on the importance of quality seed; demonstating value addition, and nutritional importance
- Using agricultural fairs, distribution of promotional materials, contacts, and giving advisory services
- Local fairs and invite stakeholders within the seed value chain
- Use of comedians, celebrities, public figures in promotional events
- Use of road sign posts attractively displayed to advertise sweetpotato
- Use of posters to advertise

Why they worked

- Market connectivity and linkages within the seed value chain

How to make them better

- Aligning all the seed value chain actors and linking to processors, root and tuber buyers and export market
- Advertising on seed availability before onset of rains
- Having an assured market for roots and tubers

Action plans for marketing sweetpotato seed

Country	Marketing strategies	Name
Malawi	Putting up kiosks and sign posts	Denis
Nigeria	Road shows and posters	Jude
Mozambique	Putting up kiosks	Benjamin
Rwanda	Use of celebrities, promo material	Jean Claude
Tanzania	Putting up kiosks in the villages	Kwame
Tanzania TAHA/MIDA	Partner identification and alignment to existing commercial project	Jacquiline/Peter
Kenya	Use of posters and promotional material	Maureen

Potential topics for continued online discussion

- Reducing perishability of vines during transport and handling - Jan Low
- Pest and disease management in vine production linking to it marketing - Kwame Ogero

1.5.2 Group 2

Some members of Group 2

Marketing strategies that worked

- The strategy to keep vines longer (i.e. Vapour Guard)
- Promotion of seed by promoting higher consumption
- The use of vendor kiosk where a vendor displays the sweetpotato and the vines to help potential buyers to understand the end product
- The use of mobile phones to link the seed vendors to buyers

Why they worked

- The pull method rather than the push method
- A private sector driven approach
- Most of the seed multipliers are using the vines to produce roots especially in the dry season

How to make them better

- Adoption of the pull approach which creates value across the value chain nodes
- Allow the private sector to invest and drive the seed process
- The marketing strategies should start with the consumers which will in turn trigger demand for seeds through a backward linkage
- Develop a private sector driven value chain where the government, NGOs, projects will come in as facilitators
- Promoting sweetpotatoes as a staple food and part of food security

Action plans for marketing sweetpotato seed

Country	Marketing strategies	Name
Mozambique	• Promoting of both vines and roots production	Jose
Burkina Faso	• Stimulating the demand through promoting consumption • Promoting vines with the roots to help the consumers understand the end product	Some
Tanzania	• Stimulating consumption to create demand • Encourage private sector involvement in the entire value chain • Creation of the enterprise is key	Kelvin, Amani / TAHA
Uganda	• Easing accessibility of vines around the farmers areas • Completing the loop from seed promotion to the consumption • Check on *Vapour Guard* availability	Richard / NRI SeFaMaCo project
Ethiopia	• Vapour guard • Working on the consumption side	Beyene / Tigray Agricultural Research Institute (TARI)
SeFaMaCo Target Countries (Uganda, Tanzania, Ethiopia)	• The need to promote sweetpotatoes as a staple food which can be consumed as other staples • Assessing the existing entrepreneurs to fill the gaps and come up with areas of improvements • Collaboration between initiatives to have a complete cycle from the seeds to the consumption sides	Harold Mate / SeFaMaCo Project

Potential topics for continued online discussion

- Free seeds distribution: opportunity or illusion? – Some Koussao
- Should we continue to promote sweetpotato as a nutrition crop or should we promote as a crop for food security and a mainstream staple? – Richard Gibson

1.5.3 Group 3

Some members of Group 3

Marketing strategies that worked

- Demonstrations on the value of using quality seed e.g. yield gain could be included into the business plan by business entrepreneurs.
- Investment in advertisements e.g. banners, business cards to inform, convince and build the product image and value to the clients, as well as behaviour change strategies.
- Street selling/vending of vines: This is mainly in Uganda but not common in Tanzania, or if it exists, there is need to identify this. The shelf-life of vines when sold on the street is questionable, so there is need to determine how to improve the shelf-life of such vines.
- Linking sweetpotato seed and root value chain actors: This is necessary to spur the demand for clean seed.

Novel / additional marketing ideas

- Promotion of novel varieites e.g. OFSP
- Periodic market analysis

Action plans for marketing sweetpotato seed

Country	Marketing strategies	Name
Ethiopia	• Conducting marketing demos • Advertising • Varietal value promotion	Mihiretu
Tanzania	• Conducting marketing demos • Advertising • Varietal value promotion	Wilfred Kiddo Rogers
Uganda	• Conducting marketing demos • Varietal value promotion	Benard Robert
Zambia	• Conducting marketing demos • Advertising • Varietal value promotion	Martin

Potential topics for continued online discussion

- Value addition to sweetpotato seed for shelf-life improvement, branding, packaging, etc. (Lead: Rogers - VISTA)
- Linking of key actors in the sweetpotato seed value chain (Lead: Wilfred - CBS)

1.5.4 Group 4

Some members of Group 4

Marketing strategies that worked

- Use of mobile phones: Notification of the availability of the market and source of supply, as well as timely delivery and facilitation of payments were identified as very strong cases to use mobile phones. Phones are affordable and others use the same approach to promote their product
- Linkage between research and vine multipliers and entrepreneurs: Vines at the research centres are early generation and are quite expensive, so having entrepreneurs in between the research station and the root producers reduces cost while enhancing quality of seed. This improves public-private
- Creating demand for clean seed through kiosks

How to make them better

- Integration of social media platforms e.g. Facebook and Whatsapp
- Creating innovation platforms for value chain segments
- Improving the location of the markets e.g. on the road side

Experiences of members

- Prior announcement for vines through electronic media in Ghana worked because many people listen to radio in the rural areas. Further improvement can be done through involvement of local journalists.

Action plans for marketing sweetpotato seed

Country	Marketing strategies
Ethiopia	• Use of mobile phone marketing; Linkage of research and private sector
Ghana	• Use of mobile phone marketing
Kenya	• Linkage of research and private sector
Mozambique	• Use of mobile phone marketing; Linkage of research and private sector
Tanzania	• Use of mobile phone marketing
Uganda	• Use of mobile phone marketing; Linkage of research and private sector

Potential topics for continued on line discussion

- Strengthening public-private partnership for enhancing vine marketing - Sammy Agili

1.5.5 Group 5

Marketing strategies that worked and how they can be improved

- ICT tools: Pre-sensitisation of the consumers helped the value chain actors to know who to call in advance. There was a linkage between buyers and sellers and an option for mobile banking. This system can be improved if the vine producers and their contacts are registered, organised in groups and associations, and if the price information is shared through SMS.
- Segmentation and branding/labelling: This works because varieties are differentiated during packing and pricing is done according to sales units and the type of buyers. The strategy can be improved through certification.
- Syncronizing seed production with demand: Ensures that farmers are getting materials on time. There is water availability for irrigation. However, with climate change and the government restricting agriculture in wetlands, a water conservation system should be developed.

Other strategies used

- Linking multipliers to producers through contract farming will assure them of the market and is likely to have higher motivation to invest in quality.

Action plans

- Certification process – Uganda, Mozambique, Kenya, Malawi
- Use of ICT tools – Tanzania, Mozambique, Malawi
- Sales unit - Mozambique
- Makrket segmentation – Malawi
- Branding – Kenya

Potential topics for continued on line discussion

- In the long run will we need middlemen in the sweetpotato seed marketing – David Talengera
- Fast tracking the seed certification process – Bramwel Wanjala

Session 2: Novel methods and new findings

2.1 Keynote: Novel delivery strategies for sweetpotato seed - experiences from the Fast Track project

Kiddo Mtunda, Everina Lukonge and Gorrettie Ssemakula

The charitable purpose of the project is to increase sweetpotato and cassava production, consumption and enhance nutrition status by SHFs in Tanzania and Uganda through timely access to improved varieties. It is funded by BMGF.

Kiddo Mtunda presents the Fast Track project

2.1.1 Seed systems

Effective seed systems provide farmers with sufficient quantities of vigorous planting disease free planting material of required varieties at affordable price and in time for planting season. Both sweetpotato and cassava seed systems are 95% informal and 5% semi-formal.

There are 12 released sweetpotato varieties in Tanzania, five of which are OFSP. Six of the 22 released sweetpotato varieties are orange-fleshed (NASPOT 5, Ejumula and Kakamega are farmer varieties/landraces, NASPOT 8, NASPOT 9 O (Vita) NASPOT 10 O (Kabode), NASPOT 12 O and NASPOT 13 O). NASPOT 5 yields well only in a few places, so usually people do not report it.

But according to a recent adoption study by the Association for Strengthening Agricultural Research in Eastern and Central Africa and the Royal Tropical Institute, less than 5% of farmers are using improved varieties of root crops.

The Fast Track project is building on the following projects: SASHA I: Marando Bora project; SASHA II - early generation seed; Bringing disease free sweetpotato vines closer to farmers, known as "Kinga Marando" (completed); Commercialisation of sweetpotato seeds in drier areas (ongoing); Cassava Seed Entrepreneurs-MEDA-MMB; Cassava Seed Systems implemented – NACRRI Uganda; 5CP seed systems - IITA (pilot project); and Alliance for a Green Revolution in Africa (AGRA) funded projects on varietal development.

2.1.2 Aim of the project

The aim of the project is to fast track the dissemination of improved varieties by using rural school children as a rapid dissemination channel to households. This is based on the assumption that each village has >200 households and at least every two villages has a primary school. On average, each household is assumed to have at least one or two school children. The project targeted children from Grades 3-6.

2.1.3 The approach

Vines are procured from Decentralised Vine Multipliers (DVMs) who had been supported by previous projects. The vines are then delivered to rural primary schools located within farming

communities, where they are disseminated to households through school children. Each household that receives vines is expected to share them with two other households within six months. This model is called "give double what you receive." The target is to reach 84,000 households through 28,000 school children and in this way, distribute over 10 million cuttings. So far, the project has implemented the first direct beneficiaries and the first "Pay Double" beneficiaries.

The project is implemented in Lake Zone, Eastern Zone and Zanzibar in Tanzania, and Central Uganda. So far, it is working with 140 schools (90 in Tanzania and 50 in Uganda).

2.1.4 Project components

1. Seed acquisition and agronomy
2. Nutrition
3. Communication, policy and advocacy
4. Monitoring and evaluation
5. Project partnerships and governance

2.1.5 Expected outputs and outcomes

- Increased acreage under sweetpotato production for improved varieties
- Increased consumption of OFSP
- Increased commercialisation - income generation
- Youth and farmers empowerment with knowledge in agronomic practices, post-harvest handling, nutrition benefits, processing and utilisation
- Nutrition education for school children-diet diversification using OFSP

2.1.6 Key accomplishments

Although the project started small, to date, a total of 647,002 vine cuttings were disseminated to over 6,000 households through 35 schools in Tanzania and Uganda. An estimated coverage of 19.55 hectares of smallholder land was planted with improved varieties, which does not include school gardens and community demonstration plots. The project established 30 demonstration plots and conducted field days in Tanzania.

The way a project is introduced is important for its successful implementation. The Fast Track project first met with district authorities to discuss the development problem, purpose and approach and project areas. The district authorities were asked to assist in developing selection criteria and targeting of schools and households. The selection criteria included: availability of school gardens; willingness to participate; clustered to ease monitoring; located in areas with no OFSP activities etc. Meetings were also held with teachers, parents, the village assembly and county government. This approach not only helped to map out the schools to participate in the project, but also secured the support and ownership of key stakeholders.

Training on general agricultural practices: Formal training was conducted for extension staff, focal persons, facilitators, and teachers. In the first year, 248 Trainer of Trainers (ToTs) were trained in both countries. In Uganda, the ToTs were awarded certificates of participation.

Vine dissemination: Only four varieties were targeted for dissemination and only 30 cuttings were of each were given. Therefore, each child received 120 cuttings to take to their parents. Most children gave the cuttings to their mothers. Demonstration plots were set up in schools (OFSP only) and in communities (mixed). Out of the schools in Tanzania, over 1.7 million cuttings

were disseminated in Lake Zone, Eastern Zone and Zanzibar. In Uganda, phase 1 and 2 reached 2,000 households in Kamuli and Mukono and around 1,300 in Wakiso. The "Pay Double" approach has already been implemented in Tanzania, through which almost one million cuttings were distributed.

Nutrition: In the first year, training materials were prepared, and an initial assessment was done to gauge the nutrition knowledge of school children in the five districts. ToT training targeted 1,898 school teachers, nutrition officers, extension officers and community facilitators were trained on the nutritional value and benefits of OFSP and dietary diversity.

Gender: Assessment was done to find out the level of knowledge and a manual was developed. Implementing partners, teachers and community facilitators were trained, and the M&E document was reviewed.

Communication, policy and advocacy: In both countries, policy issues focus on inclusion of OFSP knowledge in the school curriculum. In Tanzania, the Agricultural Non-state Partners Forum developed communication products and engaged the media. The Forum reviewed the school curriculum and shared it with stakeholders. It might be possible to include OFSP. In Uganda, nutrition is part of the curriculum and CIP is leading advocacy efforts to include OFSP.

M&E: A review is being done to determine whether it would be cost-effective for extension officers to use the existing model.

2.1.7 Lessons learnt

- Dry conditions affect continuity and success rates of the "Pay Double" approach. It is therefore necessary to adjust the vine dissemination to suit the seasons.
- School children are an important channel for delivering planting material to famers, especially due to their enthusiasm.
- Documentation of school children to be given vines should be done a few days before the distribution process.
- Vine distribution to school children should be done during the closing time (afternoon).
- Cutting, packaging, loading and transportation requires supervision and a short timeframe to limit the perishability of the material.
- District authorities play a significant role in mobilising farmers and communities.
- The project inception stage is crucial and should be well planned and budgeted.

2.1.8 Challenges

- Farmers without children in school are left out of vine dissemination activities.
- There is a very high demand for vines in Kamuli, due to the large number of children and households. Although 120 cuttings are considered too small a quantity by some, it is the right amount for sensitisation and helps to build the concept of a commercial seed system.
- In 2015, dry spells affected planting.
- Counting and bundling is difficult and time consuming.
- Accessing some of the farms to collect vines is difficult especially during the rainy season.

2.1.9 Sustainability issues: Business vs food and nutrition security

It is important to ensure the involvement of other stakeholders such as local government authorities, the Ministries of Agriculture, Livestock and Fisheries, and Education, NGOs and sweetpotato seed entrepreneurs/multipliers.

2.2 Competitiveness of Ugandan bred OFSP varieties and key emerging seed system innovations

Charles Musoke, Sam Namanda and Robert Mwanga

The project is implemented by National Crops Resources Research Institute (NaCCRI), HarvestPlus and CIP. CIP introduced OFSP to the National Agricultural Research Institutes (NARIs) in Sub-Saharan Africa (SSA) in the 1990s. The imported OFSP clones were not adapted to local growth conditions such as sweet potato virus disease (SPVD), Alternaria blight and consumption preferences (dry matter). Development of OFSP cultivars focussed on SPVD and Alternaria blight resistance, dry mater content, root shape, culinary qualities, and high beta carotene content.

Breeding for pro-vitamin A, dry matter and SPVD resistance is a big challenge. In the beginning, low dry matter of most OFSP varieties limited increased utilisation at household level. In addition, poor seed systems, coupled with a crippled extension, affected the quality, quantity, and timing of seed availability.

2.2.1 Released OFSP varieties

Over the years varieties have been bred and released in Uganda. The table below shows the variety, year they were released, their root yield and resistance to SPVD.

Table 2: OFSP varieties and year of release in Uganda

Variety	Year released	Root yield (t/ha)		Pest/disease resistance		
		On-station	On-farm	SPW	SPVD	Alternaria
Ejumula	2004	19	15	S	S	M
Kakamega	2004	15	12	S	M	M
NASPOT 8	2007	20	16	S	M	M
NASPOT 9 (Vita)	2007	20	13	S	M	M
NASPOT 10 (Kabode)	2007	18	12	S	M	M
NASPOT 12 O	2013	25	16	S	M	R
NASPOT 13 O	2013	38	11	S	M	R

** SPW-Sweet potato wilt; SPVD-Sweet potato virus disease; M=Moderate; S=Susceptible*

The new OFSP varieties offers growers good yields, a relatively high vitamin A content, with good starch and disease resistance. These varieties can compete with existing yellow-fleshed and white-fleshed varieties. They also cater for the regional differences in taste preferences. The OFSP varieties are slowly improving in rank in terms of preference. For example, in some areas, NASPOT 10 is ranked as number 2.

2.2.2 Uganda seed industry: Implications for innovation

Sweetpotato planting material in a screen house in Uganda

The seed industry consists of an informal and formal sector. The informal sector is characterised by use of farm saved seed, lower level organisation and institutional development, as well as a lack of functional specialisation. The formal sector is made up of public institutions and private sector players, mainly for grains. It is institutionalised. Seed trade is subject to seed laws that govern variety control seed testing and certification, among other things.

Sweetpotato belongs to the transitional seed system. Planting materials are accessed from the community, while improved varieties are sourced from research stations through extension and farmer groups. There is potential for elite varieties. According to the Seed and Plant Act 2006 and draft policy of 2015, transformation occurs when the seed merchant is registered and the varieties s/he produces are listed in the official release catalogue. The Act and draft policy recognise QDPM.

It is important to know the status of the seed system in Uganda today. According to research done by Integrated Seed Sector Development (ISSD), 13% of the planted area is planted with seed from commercial seed companies (formal system) and 89% of the farmers obtain seed from the informal seed system. The research also found that the available seed is not sufficient.

Farmers grow both improved and local varieties. Varieties of the major crops have done well in their agro-ecologies and coped with the prolonged dry spells. A number of new varieties of roots and tubers, such as cassava (TME14 and Nase series), and sweetpotato varieties NASPOT 1, NASPOT 11 and NASPOT 8, have been introduced and adopted by communities, hence the need to promote them further. Farmers access sweetpotato vines from both formal and informal sources. The implication for sweetpotato seed system work is that pluralism should be fostered, and robust regulatory systems built.

2.2.3 Marginal economic value of quality seed of improved varieties

An analysis of the level of demand for crops grown with quality seed of improved varieties was done. Uganda was found to have a form of public-private collaborative archetype. This means that there is quality seed for improved varieties for crops with strong demand but for which the cost of production or demand risk create barriers to private sector investment and innovation, resulting in the need for public sector involvement.

2.2.4 Progress to date in terms with pertinent issues to do with commercialisation

Commercialisation starts with clean sweetpotato planting material. In vitro tissue culture, virus elimination and multiplication is done at KEPHIS. This is followed by multiplication of mother stock by Makerere University and private laboratories, e.g. Biocrops Uganda Ltd. Secondary multiplication sites in screen houses and isolated fields in districts across the country serve as outlets for the laboratories. The materials are distributed to farmers' fields through tertiary multipliers affiliated to secondary site fields.

The idea of starting with tissue culture is a novel idea in Uganda. The diagnostic surveys found that 90% of the materials are farmers' own sources. Therefore, the formal component of the seed system only deals with 10%. With regard to inspection, there is traceability, where materials can be ascribed to a specific laboratory and secondary multipliers. Nonetheless, pests and diseases still have a negative effect on yield.

There are two modes of multiplication - dual and specialised. For these models, the foundation for piloting formal inspection protocols have been laid. This is expected to enhance quality along the chain. To start off, two private tissue culture laboratories were connected with loose associations in select districts. These associations will work with the laboratories to help them carry out inspection at the field level. Field standards for sweetpotato certification and tolerance levels have been established, the terminologies have been established and the process to publish the guidelines is underway.

2.2.5 Some critical issues

- Commercial viability of seed systems and production of sweetpotato roots – there is evidence that 30% yield increase is possible with clean seed. Less land would be required for sweetpotato production.
- Seed enterprise competitiveness – seed must be availed in good time; it should be disease and pest free, and meet consumer preferences.
- Capacity of current seed systems to respond to commercialisation – The seed policy is in place, and there is more funding and people willing to buy seed.
- Increased outputs must be addressed - value chain integration could be for animal feeds, bakery, Waragi [2] and promotions.
- Coordination is key - multipliers can integrate horizontally e.g. if people do not buy the vines, multipliers could make livestock feed.

2.2.6 Why pluralistic approaches are necessary for commercialisation of vine production

Pluralism denotes a diversity of views and approaches rather than a single method. It requires more engagement with stakeholders, assists in understanding of the systems, identification of constraints and opportunities, which inform how technologies are targeted. The end result is increased farmer acceptance and uptake of clean material.

2.2.7 Summary of discussion

According to the presentations, varieties have been released but uptake is only 5%. In addition, 95% of farmers access vines through informal systems. This formed the basis of the discussion, whose points are summed up below:

[2] Local distilled spirit

- Competition with other crops: In Uganda, the competitors are cereals like maize and rice as well as cassava. The most recent national survey showed that 55% of people had consumed sweetpotato in the last three days, indicating growth in consumption. However, this data is not disaggregated according to the sweetpotato type or flesh colour.
- Adoption behaviour: Baselines and endline surveys have been undertaken and they take flesh colour into consideration.
- There is need for a system of tracking variety adoption because farmers tend to rename any released varieties. It is possible that most of the earlier released varieties are existing under different names. Unfortunately, fingerprinting was not budgeted for in the project. In Uganda, efforts to track varieties is done through a catalogue showing the names for each variety.

2.3 Sweetpotato Commercialisation in areas with longer dry season of Uganda and Tanzania

Lukonge E., W. Kalule, G. Richard, O. Yuventino, W. Mushobozi, G. Rwegasira

In Uganda and Tanzania, sweetpotato is an important crop for food, income and health. It is grown in all agro-ecologies by all categories of people and consumed by both children and adults. Both roots and vines are utilised.

Everina Lukonge addresses participants

However, in areas with a long dry season, availability of vines is the main constraint. After harvesting the vines dry out and cannot be conserved because of lack of water for irrigation. Often, planting material is not available on time. Supply of vines during the dry period is from irrigated swampy areas, which makes them expensive. Furthermore, farmers do not exercise good agronomic practices.

Few farmers practice good agronomic practices such as use of fertiliser. Fertiliser management practices are important for increasing the production of vines, sources of clean vines, and profitability of vine production. It can therefore lead to improved food availability and income from sales.

2.3.1 Goal and objectives

The goal of the project is to enhance the capacities of vine multipliers to provide more healthy planting material of improved varieties and superior landraces to sweetpotato farmers. The objectives are:

- To equip vine multipliers with knowledge for farm business management, marketing advice for business opportunities and improved methods of vine production.
- To link multipliers and research stations for better flow of information, better varieties and technical advice.

The project is complementary to existing projects and institutions as a source of quality starter material for vine multipliers. The project partners are CBS, SASHA II project and KEPHIS (source of pre-basic seed), Kinga Marando project (net tunnels), HarvestPlus, research institutions.

2.3.2 Achievements

- Agronomic skills: The project has strengthened community based seed systems for good quality seed dissemination. Vine multipliers were trained on production techniques and fertiliser use.
- Quality seed has been accessed through the partner institutions. Community vine multipliers are used to disseminate clean seed. This has increased the proportion of farmers who use improved varieties.
- There are two major vine production methods: dual purpose (roots and vines) and mono purpose. Dual purpose is used in small-scale production. Fertiliser is seldom applied and vine cutting may be done once or twice. Mono purpose production is prevalent in large-scale production. Fertiliser is often applied during planting and more vine harvests of are made.

2.3.3 How fertilisers have increased the vine yields

Fertiliser rates and types varied from location to location due to price and availability. There was a significant increase in the number of farmers engaged in vine production, those who apply fertiliser and those who purchase vines. The data confirms a linear relationship between fertiliser rates and yield achieved (number of bundles per hectare). Roots were considered as a by-product, however they were mainly used for exchange with labour for watering and pump hire.

From March 2013 to March 2015, 8,623 bundles of vines were distributed in Tanzania. From March 2015 to January 2016, 8,143 bundles were distributed.

The main differences are that the mono purpose method produces no roots to sell but producers get more vines, especially when fertilised. The number of cuttings produced per hectare were reduced when on the dual purpose system was used. Vines could not be harvested more than once. If necessary they could harvested twice but it was not easy. More income is derived from roots than vines in a dual purpose farm. When the field is exclusive to vines, the profit is higher. The level of fertiliser to be used in vine production can be estimated based on the rise in level of profit. In Uganda, the same results were observed in fertiliser demonstration trials.

The recommendation of the project is that farmer multipliers should use 50kg of fertiliser per hectare, as this will enable the farmer to get benefits without being financially stressed.

2.3.4 Conclusion

Out of the two methods, dual purpose production benefits less from fertiliser. Fertilisers doubles profitability of the mono purpose method. Adding another 100 units of nitrogen further increases profitability; more than this is not worthwhile. Combining organic with the inorganic fertiliser may make production even more profitable but this will depend on the local costs of manure.

2.3.5 Lessons learnt and way forward

After awareness and training DVMs were ready to use fertilisers in their multiplication fields. Fertilisers can double the vine production. The way forward is to undertake mapping of community vine multipliers, link farmers to the market and improve communication strategies for the vine requirements of sweetpotato farmers.

2.3.6 Summary of discussion

Farmers working with the Kinga Marando project in the Lake Zone have made complaints about the difference in vine prices offered by different dissemination projects. This is in light of the fact that the Kinga Marando had advised them not to sell for less than Tsh. 5,000 per bundle. There seems to have been a misunderstanding. Farmers were used to selling bundles for between Tsh. 7,500 and 9,000. The Fast Track project informed them that vines would henceforth not be bought in bundles but it would instead pay Tsh. 10 per cutting. This clarification has since been made, but if necessary, field visits can be arranged to address the issue.

How many times are vines cut? On average, vines are cut after 2.5 months. In the mono purpose model, they are cut three to four times, depending on the planting time and the demand.

What is the impact of perishability of vines? This is something that needs to be studied.

Recommendation: An analysis should be done to determine the actual rate of return and economic viability of vine multiplication, especially when fertiliser is being applied. To do this, it is necessary to do an analysis based on the number of cuts that will be done as well as a budget analysis.

2.4 Effect of nitrogen and phosphorus on sweetpotato root production under Guinea and Sudan savanna agro-ecological zones of Ghana

Abukari Alidu Issah, Abidin Putri Ernawati and Edward Ted Carey`

2.4.1 Background

Demand for sweetpotato is increasing internationally and locally due to awareness of its nutritional and health benefits. Some of the benefits include high energy, vitamin C and B6, and beta carotene content, low glycaemic index, protease inhibitors and antioxidants. In SSA, sweetpotato production is growing faster than any other crop in terms of cultivated area. But in Ghana sweetpotato production grew relatively slowly in comparison to the rest of SSA. This slow growth of the local sweetpotato industry is mainly due to the low production efficiency of the crop. Studies conducted in countries like Nigeria and Papua New Guinea show that use of fertiliser can lead to increased storage root yield. Such information is not available for Guinea and Sudan savanna agro-ecological zones of Ghana. Therefore, the objective of this study is to investigate the interactive effect of levels of nitrogen and phosphorus on sweetpotato growth, development and yield in Guinea and Sudan savanna agro-ecological zones of Ghana. The study locations are Nyankpala and Bawku.

2.4.2 Materials and methods

The design is factorial arrangement of treatments with four replications. Apomuden variety was used as it is the only released OFSP variety available in Northern Ghana. The plot size was 6 x 4 m. Treatments comprised combinations of five levels of N (0, 30, 60, 90 and 120 kg/ha) and five levels of P (0, 40, 80,120 and 160 kg/ha).

2.4.3 Measurements

Vine length, number of secondary vine branches and leaves were measured. Storage roots were graded into marketable and non-marketable lots, counted and weighed. Plants were partitioned into leaves, stems and roots, oven dried to constant weight to estimate plant component dry weights and to calculate biomass partitioning rates. A single composite soil sample was taken from each rep at each site and analysed for nitrogen, phosphorus, potassium, pH and organic matter.

2.4.4 Data analysis

The experimental data were subjected to analysis of variance using the General Linear Model procedure of the statistical analysis system to determine main factor effects and treatment interactions. Means were separated by Fisher's protected Least Significant Difference test at the 0.05 level of probability. Best-fit equations were determined using coefficient of determination and root mean square error. Graphical analysis were carried out using Sigma Plot. A response to phosphorus and potassium is not expected if the soil tests greater than 25 and 150 ppm respectively (Smith et al., 2009).

2.4.5 Results

In the table below, the data shows that you need to apply the maximum level of nitrogen and phosphorous to get high levels of biomass.

Table 3: Results of nitrogen and phosphorus experiment

	Phosphorus				
Nitrogen	**Kg ha^{-1}**				Average
Kg ha^{-1}	40	80	120	160	N
30	5.1	5.25	7.28	5.6	5.81
60	5.78	7.38	5.45	7.6	6.55
90	6.35	6.35	5.73	7.15	6.4
20	6.08	6.75	6.93	7.45	**6.8**
Average P	5.83	6.43	6.35	**6.95**	

When nitrogen and phosphorus were applied at their highest rates in this study, total biomass production per hectare increased by 19% and 14%, respectively, when compared to the untreated check.

At Nyankpala, the main effect of phosphorus is not significant, although there was a linear and increasing trend in storage root numbers. However, at Bawku, phosphorus application led to a

significant and linear increase in storage root numbers. There was no interaction between nitrogen and phosphorus for fresh storage root yield.

In comparison with the untreated check, when nitrogen and phosphorus were applied at their highest rates, fresh storage root yield per hectare increased by 11% and 15% respectively at Nyankpala and by 37% and 50% respectively at Bawku.

Generally, with or without fertiliser, the average yield in the Sudan savanna location is about 37% less than that in the Guinea savanna zone. The data from this study indicate that the maximum level of nitrogen and phosphorus for optimum yield was not reached in this test.

2.4.6 Summary of discussion

Why was potassium not included, even though it is important for root production? The study was meant to test only two nutrients. Previous test results showed that potassium was high, so it was assumed that it would still be high. Samples were taken at the time of transplanting, but before the results came, it was realised that the soil potassium levels were low. Therefore, potassium will be included in the trial as a third factor and fractional factorial design adopted to test only the most salient treatment combinations in the coming season.

Suggestion: Nitrogen - potassium ratio is the main nutrient combination for root yield. It may be advisable to take out phosphorus and focus on these two.

2.5 "100 best bet": sweetpotato varieties for Sub-Saharan Africa

Robert Mwanga, Rosemary Gatimu, Bramwel Wanjala, Benjamin M. Kivuva, Edward Carey, Jan Low, Maria Andrade

Over the years, breeders have released many OFSP varieties across the continent. The demand for these varieties varies across the countries, and there are some that are no longer being requested. In order to rationalise the use of resources, the SASHA project embarked on an initiative to identify varieties that had to be systematically conserved for use by national programs. These varieties, dubbed "100 best bet" have special traits. They are unique in that they have important and desirable characteristics such as dry matter, beta carotene, drought tolerance, weevil resistance etc. The selected varieties will be cleaned up and maintained in tissue culture and screen house at KEPHIS PQBS Muguga, and will be distributed to countries on request at a small charge. For commercialisation, some of the varieties that have not yet been exploited could make it to the market.

To select the varieties, a template was sent to breeders to respond to the attributes that would be considered when selecting the "100 best bets" for SSA. These attributes included but were not limited to: estimated number of households who grew the varieties between 2014 and 2015; estimated yield per hectare; skin colour; beta carotene content; dry matter, maturity period; dual or mono purpose; resistance to SPVD and Alternaria blight. The scores were given based on these attributes and priority ranking done based on the agro-ecology e.g. for uni-modal and bi-modal climates.

Another factor considered was the status of the material, e.g. whether it was cleaned up or whether it was in the process of being cleaned up, whether it is in tissue culture, or available in the screen house to be sent out as cuttings for establishing the source of seed.

Each country sent in their best ten varieties, based on the scores. Other sources of information were survey reports, students' study reports and other research documents. Those whose important varieties are not yet on the list will have a chance to add them.

The list of the varieties are appended in *Annex 1.* In June 2016, the list will be discussed in the breeders' meeting.

2.5.1 Summary of discussion

Rationalisation of the regional germplasm collection: Fingerprinting and phenotyping of the varieties will be done. Those that have been kept in tissue culture but have not been requested will be cleared out. The "100 best bet" list will be maintained for long-term storage in tissue culture. In order to respond more swiftly to requests, the idea is to keep many cuttings available for quicker multiplication.

Material Transfer Agreement: Most countries are signatories of the Cartagena Protocol that stipulates conditions for the transfer of genetic materials and intellectual property rights. There is an agreement with KEPHIS that material will be transferred not for profit, but to facilitate benefits by more countries. CBS has already benefitted from this arrangement; when the company's customers request high dry matter varieties, it is possible to respond very swiftly by contacting KEPHIS and getting the plantlets or cuttings for multiplication.

Promotion of specific varieties: This will vary from country to country. In Uganda, the first promotion of OFSP focussed on Ejumula, Kabode, Kakamega and Vita. With this information, it is possible to revisit the types of varieties that should be promoted. In Rwanda, the likelihood is to focus more on varieties with high dry matter. In other countries, there may be a drive to promote promising varieties that are yet to be released.

Session 3: Learning journey: good agronomic practices for commercial root production

A Learning Route is a planned journey with learning objectives that are designed based on i) the knowledge needs of development practitioners that are faced with problems associated with rural poverty and, ii) the identification of relevant experiences in which local stakeholders have tackled similar challenges in innovative ways, with successful results and accumulated knowledge which is potentially useful to others. The Route allows for the experiential encounter between travellers and hosts, both having mutually useful experiences and knowledge. For more information on learning routes, visit www.africa.procasur.org. The learning route included a visit to TAHA OFSP commercialisation initiative and so an introductory presentation was made before the visit.

3.1 TAHA OFSP commercialisation initiative in Tanzania

Jacqueline Mkindi

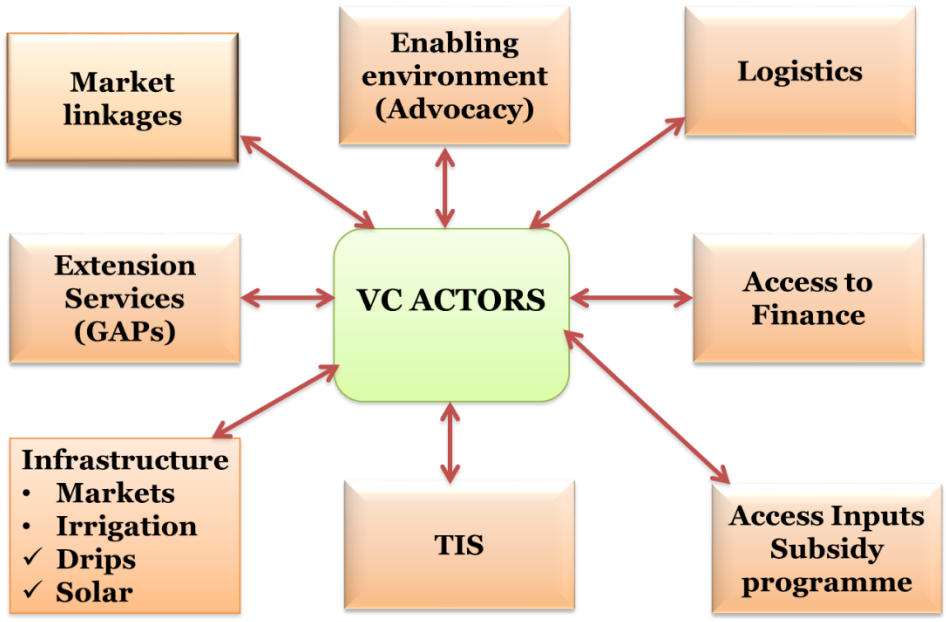
TAHA is an apex private sector member-based organisation that facilitates the development and inclusive growth of the horticultural industry in Tanzania. TAHA works to ensure that the agricultural environment is conducive for farmers, through technical support, advocacy, access to markets and trade facilitation.

TAHA has a development as well as commercial focus. The commercial arm includes logistics and access to markets. TAHA Fresh is the horticulture logistics solution that does air freighting, trucking, clearing and forwarding, and perishable ground handling.

3.1.1 The value chain approach

The figure below shows the aspects of the value chain that TAHA addresses.

Figure 5: The value chain aspects addressed by TAHA



3.1.2 OFSP commercialisation strategy

Jacqueline Mkindi talks about TAHA's work

TAHA decided strategically to prioritise and commercialise OFSP due to the crop's nutritional values and economic potential.

The critical requirement for sustainable profitability of such an enterprise is an established market. Therefore, in 2013 to 2015, a thorough market research was done at different levels to identify a strategic market partner. In 2015, a market relationship was established with a company in Israel, which is a major producer and distributor of horticultural products to European countries. TAHA has signed a ten-year contract with the company to supply up to ten containers (40ft @ 20 tonnes per week or 200 tonnes per week) which go to five different market destinations in the EU - France, the UK, The Netherlands, Sweden and Switzerland.

As part of the contract, TAHA had to test some varieties that are in high demand. Trial sites were established in three regions: Arusha, Manyara and Kilimanjaro. The production model consists of a nuclear farm that is run by TAHA and approximately 500 outgrowers. The aim is to attain full production of up to 600 ha. TAHAFRESH Handling Ltd, which is a well-established logistics company, will handle logistics.

3.1.3 Planting material and trials

This was a critical component of this venture. A partner had to be found who could provide clean, disease free planting material of Jewel, Kabode and Mataya that could be evaluated. Two hectare trial plots were established in each of the regions. The trial sites tested all the key components e.g. seed multiplication sites, good agronomic practices, harvesting, curing, storage and packaging and logistics systems.

Trial results show that production cost per hectare is Tsh. 7.5 million per hectare (USD 3.571). The range provided was that the yield should be between 35 and 40 tonnes per hectare. So far, this is 37 tonnes. The curing process is undertaken at 30 degrees centigrade for five days. After that, they are stored under 12-14 degrees centigrade, and then they are freighted to Europe.

3.1.4 Challenges and lessons learnt

- Poor vine management due to long transport distance from nursery location.
- The curing process took too long due to lack of proper heating facilities.
- There was low capacity and commitment by SHFs in Mto wa mbu in Manyara regions. Many did not adopt the new varieties introduced by TAHA, but the few who did have started getting good results. This is now raising interest from other farmers.
- Weevils due to infested soil resulted to 100% export rejects at Mto wa mbu and about 50% at Arusha Bloom farm. Soil should be tested for weevils and wire worm before planting. To commercialise this crop, control of pests is critical.
- Harvesting during heavy rains resulted in additional washing and farm transportation cost. To avoid such challenges, harvesting should be done during the dry season.

3.1.5 Roadmap

The results have been positive. The next steps are to mobilise resources and partnerships to establish the business, establish a nuclear farm and build outgrowers clusters according to the plan. TAHA is also sourcing resources to build processing facilities for curing, grading, sorting and packaging.

Only 70% of production will be exported. Therefore, there is need to think of expanding the business model to integrate value addition in the business system.

3.1.6 Summary of discussion

Root size: The size, shape and weight of the roots are stipulated in the contract.

Harvesting time: For consistent supply, harvesting must be done throughout the year. Harvesting in the dry season might result in higher number of rejects because of weevil damage.

Strategies for upscaling the business: The market can be serviced for now. However, there is a Finnish company that has requested for samples, as well as Finlays Company in Kenya. In terms of backward linkage, the first generation will have to come from the tissue culture labs, but multiplication sites will also be developed to service outgrowers.

Working with SHFs: When working with SHFs, sometimes, the agronomic practices could be a challenge. Through TAHA, there is a technical department responsible for farmer mobilisation and institutional development, and facilitating accreditation of farmers. Only products of good quality will be purchased from contracted farmers.

3.2 Background information on sites to be visited

CBS is a commercial crop biotech company incorporated in 2011. The company's mission is to deliver high quality vegetative seed materials that will reduce or eliminate constraints to crop productivity caused by disease, pest organisms and environmental stresses. The company has a modern biotech lab facility located at Kisongo, Arusha - Babati Road in Northern Tanzania. The facility comprises of a media preparation room, media store room, inoculation room, culture transfer room, sterilisation area, washing area, and growth room fitted with automated temperature and humidity regulators. Hardening facilities and nurseries are built on a two-acre plot with the capacity to produce 10, 0000,000 plantlets and potato mini-tubers.

The company receives virus indexed in vitro sweetpotato materials from KEPHIS PQBS Muguga laboratory for further *in vitro* multiplication. The plantlets are then hardened at CBS screen houses to produce Generation 1 planting materials. The sweetpotato varieties currently at the CBS facility are Kabode- (NASPOT 10), NASPOT 11, NASPOT 12, NASPOT 13, Jewel, Jitihada, Mataya, Ukerewe, Bela, Mayai, Kiegea, Kakamega, and Zambezi. Apart from sweetpotato planting materials, the facility also produces tissue culture bananas, Irish potato, cassava, coffee and pineapple.

Silverdale – Kimashuku Farm – Moshi: This is one of three farms piloting TAHA OFSP production for export to Israel. The farm is 1 Hectare (2.5 acres) in size and is owned by a farmer called Shaban Shoo. It is located in Kimashuku, Hai district about 60 km along the Arusha-Moshi road, on the slope of Mt. Kilimanjaro – the highest mountain in Africa. The farm is planted with

Kabode, Mataya and Jewel OFSP varieties. The farm acquired planting materials from CBS at Arusha Bloom farm and planted at Silverdale farm.

3.3 Preparations

To prepare for the learning journey, participants read the brief on the background of the sites. They discussed and agreed on the learning objectives, priority questions and protocol during the visit. After the visit, all members gave highlights and key learning points from their perspective, documented their reflections and noted the implications of their visit for different types of farmers (women, youth, and resource poor). Group members identified up to three action points coming out of the visit that they would personally act on within their own work or institution. Each group gave a presentation to the plenary on the main learning points; new or more in-depth research questions could be pursued in light of the visit – either by the host of the visit or in your own institutions; individual action points arising from the visit and nomination of topic and lead person for continued online (Google Group) discussion.

3.4 Group reports on the learning journey

3.4.1 Group 1: Good agronomic practices for commercial root production

Members

Jose Ricardo, Sammy Agili, Bramwel Wanjala, Ndirigwe Jean, Jude Njoku, Jean Claude Nshimiyimana, Kennedy Masamba, Benjamin Rakotoarisoa, Eliah Munda, Filipe Zano, Issah Abukari, Fekadu Gurmu, Kwame Ogero and Mihiretu Cherinet.

Objectives

1) To find out any new practices being implemented to satisfy the export market i.e. to ensure proper root size, shape.
2) To find out the strategies being used in order to meet the demand.

Findings

In order to meet market demand, TAHA has identified outgrowers with cumulative land of about 600 ha on which they will practice staggered production based on a production schedule. Shaban Shoo, the farmer who was visited, has planted sweetpotato on 2.5 acres but has 6 acres of land which gives him room to practice crop rotation.

The varieties Jewel, Kabode and Mataya, which are under assessment, were selected by the customer from Israel. The target root size is 165-350 gm. To achieve this, TAHA is using narrow plant to plant spacing. Roots will be graded into three classes: L1, L2 and L3. Spacing is 15cm x 150cm which gives plant density of about 44,000/ha, which is 11,000 more than the conventional spacing of 30cm x 100 cm.

They use drip irrigation to ensure supply, the water reservoir used measures 15 m x 6 m x 2 m (180 m^3) which can be used for two days in the dry season. This seems like a lot of water to use on such a small space. They use chlorine and molasses to unclog the irrigation pipes. This elicited a lot of discussion, because most participants did not know that molasses could be used.

The fertiliser regime used is recommended by the client. Urea is applied at the following rates: 35kg at 35 days after planting; 75kg at 60 days after planting; 75kg at 90 days after planting. It

is important to note that it seemed that the agronomist on the site might not have had the full extent of information.

Mechanisation is used for ploughing and harrowing; with ridging and harvesting are done manually. Manual labour is used at harvesting at: 60 people x 30 days x Tsh. 5000/pp seems to be an unrealistic figure. It was suggested that ridging could also be mechanised.

To reduce damage on roots, vines are pulled out together with the roots. The farmer uses neem and betrine to control weevils at a ratio of 30 ml/20lof water.

Recommendations

- Applying fertiliser at 90 days when the crop is ready for harvesting seems to be a waste.
- Six months are not enough for rotation and it is important to plant another crop instead of leaving the land fallow.
- The use of drip irrigation is a good lesson. It is a practice not normally used in sweetpotato production. However, for good water management irrigation stops a few days before harvesting.
- Should leave enough space between varieties. They are now grown very close to one another.
- The farmer and agronomist need training on pest and disease management as they were not able to identify SPVD. TAHA CEO had asked for this topic to be included in the CoP online discussions). Participants felt that there was need to evaluate whether this is an appropriate topic to conduct online. Integrated Pests and Disesases Management (IPDM) training modules are available on the www.sweetpotatoknowledge.org
- The harvesting cost mentioned is very expensive. It does not seem economical to use human labour.
- After harvesting roots, there is need to utilise the vines e.g. as animal feed- directly or through silage preparation.

Further research areas

- Optimal fertiliser application: Fertiliser application is not clear. The amount of urea (a nitrogenous fertiliser) recommended by the Israel agronomist is on the higher side. It favours more vegetative growth at the expense of roots. The team in the field stated that most of the instructions were provided by the agronomist from Israel and to get a clear justification for the application of high levels of urea, and also for applying fertiliser at 90 days, it would be necessary to speak with this person. There would also be need for soil analysis data.
- Mechanisation of harvesting: It can be made possible by increasing the length of the front axle of the tractor.
- In ground curing: This is whereby the vines are harvested and roots left in the ground for a week or two before harvesting.

3.4.2 Group 2: Business case for root production

Members

Jan Low, Maria Andrade, Gorrettie Ssemakula, Charles Musoke, Martin Chiona, and Koussao Some

Overview

The pilot project was started by the TAHA with an Israeli company, who is the buyer of the product (sweetpotato root) that will be produced by TAHA. They will contract a cluster of farmers on 600 Ha. The minimal farm size that can generate profit per farmer is 1 acre. They will produce roots from three varieties: Jewel, Mataya and Kabode.

Participants on the learning journey interact with Amani Temu of TAHA and Wilfred Mushobozi of CBS

Findings

Source of vines for growers: TAHA buys three-node cuttings from CBS at 150 TZS per cutting. They send the cuttings for rapid multiplication to a multiplier in Arusha. Then, 30 cm cuttings are sold to growers on credit at 50 TZS per cutting for root production. The cost of vines will be deducted after roots have been produced and sold by the company.

Pricing: The Israeli company fixes the price of roots. TAHA works backward to fix the price with root growers based on the company price. It is planned that the price be reviewed each growing season. The fixed price is higher than the price in the local market, but the roots must satisfy a size criteria. The root size should be 300 g or 3 to 4 roots per kg. Farmers will get 1 Euro for around 1 kg of sweetpotato.

Field establishment and management: Drip irrigation is used, which allows for production during the dry season. Irrigation kits are given to growers as an interest-free loan, and it costs 2.5 million TZS per acre. The drip irrigation installation can be used for five years. Water is sourced from a nearby river.

TAHA take care of the production cost but will recover the costs from root price. Technical assistance on fertilisation dosage, fertigation, spacing, etc. is provided by the agronomist in accordance with the Israeli company's stipulated requirements. The agronomist works on a weekly program but reports on daily activities undertaken.

Quality management in the field includes spraying against weevil with an insecticide provide by the Israeli company. Only fungicide is used to treat the cuttings before sell. The target market is conventional, not organic. The locally prescribed insecticide by the buyers will limit residual effect.

Root marketing: Roots will be sorted by size and quality at a collection centre. The root with requested size will be sold to the Israeli company. Rejected roots can be sold at the local market but the price is not good as the market is over supplied by other sweetpotato roots. The strategy that TAHA intends to pursue is to create processing units to add value before selling to the local market.

Quality management during shipping: TAHA has the logistics and experience in shipping perishable products with a shorter shelf-life than sweetpotato e.g. water melon. Therefore, handling sweetpotato transportation will be easy.

Profit sharing: 100 percent of the profit will go to promotion and development. This profit can also help to support the local research system.

Acreage: The estimated acreage of 600 Ha is what has been determined to be necessary to sustain supply, based on the yield per hectare which is 37 tonnes per hectare. This also varies according to the agro-ecological zone.

Vines: It was recommended that the vines be used for livestock feed after root harvesting. It was also observed that there were no other sweetpotato fields in the vicinity and that could have contributed to the clean fields. Maybe the situation could change if the production expanded.

The pending question is whether the high levels of fertiliser applied would make varieties with low dry matter even more watery.

3.4.3 Group 3: Sweetpotato seed marketing strategies

The objective

To understand how the entrepreneur determines the price of seed, identifies clients, conducts product and market mix at different stages of production.

Findings

Stability: Apparently very strong due to monopoly and assured market for quality seed. The reason is that TAHA got a ten-year contract. Should the structure of the market change from

monopoly to a competitive market, the stability might change. Producing seed for different crops (e.g. banana, pineapple and Irish potato) also reduces risk.

Seasonality: The Company produces according to demand, so seasonality does not affect production. The main products vary from season to season. But through observation by the group, it seems that banana is the main product that is driven by demand and has no threshold value.

Pricing: The supplier has monopoly and determines the price. Prices in the informal and formal market differ, with the formal market having a larger gross margin. There is a discount, and the price per cutting reduces with the quantity purchased.

Willingness to pay: Farmers value the product due to quality and cleanliness. Those farmers that have seen demonstration plots are more willing to pay. The responses from farmers differs from region to region, and according to the size of the farm.

Marketing: The Company advertises about the demonstration plots on the radio and in information kiosks. Customers are followed up after distribution of vines because the company does not have forward linkages with farmers.

3.4.4 Group 4: Good practices to increase tissue culture multiplication rates to reduce cost

Members

Beyene Demtsu, Marian D. Quain, Maureen Mwangangi, Nessie Luambano, Kiddo Mtunda and David Talengera

Findings

The nursery manager of CBS explains to participants how cuttings are treated before transportation

Media: CBS uses stock solutions and sugar as sucrose. Three to five explants are put in each jar. In order to save costs, cling film is used to seal cultures in place of parafilm; and CBS works on different crops.

Subculture intervals and cycles: The subculture intervals are 3-4 weeks and flush out takes place after every four cycles. This system keeps the clean mother plants in the screen house to use routinely for initiation. It was observed that the number of cycles before flushing out could be increased.

Production capacity: The daily output depends on the specific crop and the growth rate of the crop.

Mechanisms to reduce production costs: CBS uses the national grid electricity and has a backup generator. Different sources of water are used – rain water is harvested, the main supply as well as purchase of water whenever there are shortages.

Hardening and survival rate: There is 100% survival rate during hardening.

Multiplication rate: It all depends on the length of time it stays in the growth room. It is based on the genotype. Kabode, NASPOT 12 and 13 are more prolific than Jewel variety. The multiplication is based on the demand, but for those that do not respond well, more are initiated.

Ratooning: No ratooning is done, but they take out Generation 1 planting materials. If other farmers require cheaper planting materials, outgrowth of ratoons is supplied at cheaper cost. More ratoons are possible if the screen house practices are stringent. When working with customers that only require Generation 1 material, the cost is higher (TZS 150 each). Such customers are not interested in cuttings from a ratoon harvest.

Main challenges: One of the challenges is related to securing the market.

Quality*: I. Setosa* indexing is in progress.

CBS already has satellite screen houses for bananas and they are thinking of putting up a similar system for sweetpotato.

Lessons learnt

CBS uses cell plugs and coco peat for in the screen house, and Vapour Guard to extend shelf-life of the cuttings before transporting it.

Research topic

Data loggers should be put in the screen hose to document humidity, temperature, light intensity and plant growth rate because the screen house uses black netting. Documenting location specific data and coupling it with plant growth and multiplication rates would help to develop regimes to boost screen house production. The group suggests to evaluate the requirement of light for each sweetpotato variety as a research topic.

Investment capital: The commercial lab was a vision, and a strategic plan was developed and used to raise funds. It is not yet fully developed, and more funds are being sourced.

No action points were agreed on but Nessie Luambano was identified as the leader for the online discussion.

Parallel working group sessions on good seed production practices

4.1 Group 1: Triple S

The objectives of this working group were to:

1) Summarise key technical knowledge on Triple S based on current good practice
2) Identify requirements for out/up scaling in countries represented
3) Propose key indicators to monitor effectiveness and uptake of Triple S

Triple S (Storage in Sand & Sprouting) is important because shortage of planting material is one of the main constraint for sweetpotato production in many SSA countries. Farmers in SSA use vine cuttings from the foliage of live sweetpotato plants. However, during the months when it is not raining, the weather is extremely hot and there is no water source to irrigate sweetpotato plants. As a result, farm saved sweetpotato plants dry off due to the combined effect of extreme hot weather and water stress. The length of the dry season ranges from 2-8 months. Other environmental factors such as temperature and humidity are reported to differ from country to country. Therefore, the question of the effects of each of these variables on the efficiency of Triple S in various environmental conditions of SSA is still open for research. Generally, the technicality of Triple S technology is easy to implement at farmers' level if some issues like inputs and storage lengths of roots under different conditions are answered.

The input requirement is dry cool sand that is collected locally and placed in a basin. Farmers complain that basins are expensive, and they compete with other household needs such as handwashing. The research question is "*in the absence of basin what are the other options?*" Related to this, the criteria for selecting a container are: affordability, availability, strength, temperature regulation, size (root and sand holding capacity), water and moisture regulation capacity. Cut sacks, polythene bags and clay pots were recommended. The type of container should be selected based also on the suitability for is specific environmental conditions.

Containers are usually lined with newspaper to absorb moisture coming out of transpiring roots. Where newspapers are unavailable, it is important to investigate replacement of newspaper under different containers. A clay pot might be a better option to prevent rats and it would not need laying with newspaper because it provides natural aeration. This has been tried successfully in Mozambique. In addition, people in parts of Mozambique use a hole covered with grass and ash for storing roots for food, so it may be possible for them to also use this method to roots for Triple S. The positioning of roots in the container is critical to prevent it from attack by rats or humidity.

Sand is inert, has good aeration, and controls temperature conductivity. The size of the sand grains should be considered because smaller grains of sand are very compact and restricts aeration. In Mozambique, experience of using volcanic ash shows that a farmer could keep sweetpotato roots for more than six months.

Based on available knowledge on sprouting, for areas that have more than four months of dry season, it is important to de-sprout.

Studies are underway to determine the effect of different root size on storage duration and how de-sprouting affects potential storage time. The research questions are: (i) What are the

varietal differences on effectiveness of Triple S: (ii) What is the optimal root physiology and harvesting age? (iii) What is the relationship between the apical dominance and frequency of de-sprouting on stored food depletion and length of storage?

Recommendation for technical elements are (i) vines should be harvested/ de-haulmed before roots are harvested; (ii) longer period of dry season needs de-sprouting practice; (iii) use of old newspapers for lining container wall should continue until other option is developed; (iv) the choice of container can be made based on the context; (v) the size of roots should be by weight (150-250 gm); (vi) sand should be large grained to allow enough aeration[3]; and (vii) transplanting bed should be selected close to water.

Countries (Mozambique, Kenya, Burkina Faso, Ethiopia, Malawi and Uganda) are at different levels of testing, adapting and scaling out Triple S, supported by existing projects. They require ToT trainings, and training resource materials.

4.2 Group 2: Sandponics

The objectives of the working group were to:

1) Discuss current knowledge
2) Identify and immediate changes in protocols needed
3) Identify common data collection needs across the country

Several countries that have been using sandponics technology - Lima, Mozambique, Zambia, Malawi, Uganda and Kenya. Ethiopia is in the process of adopting the technology. Current sandponics technology uses nutrient formula for potato. However, trials in Kenya have been conducted to establish the optimum nitrogen level for optimal vine production. It was established that 150 parts per million (ppm) has been shown to be suitable on five different varieties). The way forward will be to in-cooperate the 150 ppm in fertiliser formulation and compare with conventional vine production in sterile soil.

The frequency of drip irrigation varies depending on the environmental conditions. When doing irrigation, collection trays can be put beneath the pots and the next irrigation should be done only after nutrient in the collection trays has been utilised.

Research questions identified are:

1. Effect of different growth media on vine multiplication rates (soil, sand vs coco peat) i.e. nutrient composition and physical structure
2. Effect of different nutrient fertiliser rates on multiplication rates
3. Effect of varying N levels on multiplication rates (Preliminary findings from Kenya-150ppm)
4. What are the optimum plant density/population per given pot for specific variety?
5. Whether to leave vines grow for 4-5 months or harvest every 1 or 2 months

[3] Very large roots lose water by transpiration and dry quickly in environments with low humidity. Dried roots are not biologically active and therefore will not sprout. Therefore, sand should be big enough to allow oxygen availability for root respiration and outlet of released ethylene from the container. While the suggestion is to use large size granules, the exact size is still a research question.

The specifications for setting up sandponics are: the greenhouse, (15 m x 5 m), clear polythene sheets, netting for sides, water source, tanks and tower, drip irrigation, piping and fittings, sand, sand sterilisation, nutrient preparation, pots and plants.

4.3 Group 3: Screen house, tissue culture conservation and micro-propagation

The objectives of this group were to:

1. Review practices to increase multiplication rates under screen house conditions
2. Share protocols for in vitro conservation

Good practices for tissue culture micro-propagation and screen house production

Tissue culture

- General cleanliness – remove shoes or use shoe covers, and wear closed shoes for the lab; wear lab coats; have double doors and keep them closed at all times; wash and disinfect hands before touching anything in the laboratory. Have disinfectant and 70% alcohol at vantage points.
- Preparation of explants, and initiation – the good practice is to first raise plant material in the screen house as source of explants. Monitor plants in screen house to keep them healthy. Instead of watering from top, water from bottom; work on one variety at a time; labelling should start right from the screen house to avoid mix up.
- Culture maintenance – have records for routine sub-culturing. Document observations (records) on the growth, contamination, of various varieties in the growth room this will facilitate production planning. Confirm health status of source of explant by I. setosa grafting before initiation in vitro.
- Medium preparation – make sure that the apparatus used are as clean as possible, disinfected and sterilised – let sterilised medium stay for 48-72 hours to know if it is good enough for initiation or not (this may not be very applicable in commercial production). However, it may be used as check where necessary. Equipment for taking measurements should be well labelled; have a checklist on stocks preparation; use correct pH level (5.7±1); calibrate the laboratory equipment routinely.
- Aseptic operation – disinfect and run the laminar flow for at least for 15 minutes before starting to subculture; label all materials. Where applicable, use ultra-violent light in growth room.
- Maintain light intensity, temperature, and humidity.
- Monitor for contamination and remove as soon as possible.
- Disinfect growth room e.g. spray with 70% NaOCl, use mortalised sprayer by fogging, or disinfectant spray; and fumigate.

Screen house

- General cleanliness – provide footbath, protective clothing, and hand disinfectant at the entrance. Have a double door fixed.
- Restrict entrance and record all activities in screen house.
- Monitor and do routine spraying for pest and diseases in screen house e.g. use sticky cards; beer in the screen house attracts and traps snails. Use of salt also kills snails.
- Acclimatisation – wash and rinse off all nutrient media from plantlets before planting. Reduce humidity gradually to reduce mortality of the seedlings.
- Substrate preparation – use pasteurised potting substrate. Use substrate that allows for drainage and maintains moisture. Potting medium sterilisation is important and

varies from country to country. To help drainage, soil should be mixed with gravel. The ratio of soil:farm manure:gravel is 3:2:1.

- Multiplication and ratooning – plant 3-node cuttings (two at the bottom and one at the top). In cold areas, cover planted cuttings with black plastic during sprouting to enhance growth. Fertiliser should be applied after cutting, to enhance growth.
- Record keeping – label at all levels of operations.
- Provide double protection in screen house for mother plants and plants to be indexed.

Key technical knowledge on increasing multiplication rate in the screen house

- Start with good substrate with high nitrogen levels
- Use rooting hormone to enhance growth
- Supplement with nitrogenous fertiliser and foliage spray
- Staking of vines (trailing)

Protocol for *in vitro* conservation

- Include sorbitol
- Double sucrose concentration to 6%/litre

Research gaps for tissue culture and screen house operations related to pre-basic seed production

- Conservation media - use of sugar alcohols osmoticum – mannitol, 50% MS medium and white medium
- Screen house operation conditions – use of data loggers in screen house to document humidity, temperature, light intensity, and plant growth rate
- Optimise screen house harvest intervals and investigate ex vitro growth media for different varieties to optimise growth rate

4.4 Group 4: Agronomy and crop management for sweetpotato seed

The objectives of this group were to:

1. Consolidation the online discussion on the best way to distribute vines (whether by weight, numbers or volume) for marketing purposes.
2. Review of experience on ratooning.
3. Identify other relevant topics.

Current experiences

Ratooning of plants for quality seed vine production: Although no systematic research has been conducted, data collected from different projects shows a general decrease in the amount of vines harvested. The first ratoon is usually the most productive. The number of vines harvested per ratoon depends on management i.e. water and fertiliser application, pest and disease management. Seasons and country conditions affect the amount of vines harvested. Replanting of ratoons will also depend on the market. Therefore, the number of ratoons cannot be generalised across countries. For example in Peru, up to 18 ratoons have been harvested. Instead, recommendations should be made based on country and agroecology.

Unit of measure – weight or numbers? Whether weight, bag or number of vines are used, it is critical to be able to estimate the number of cuttings sold. If dealing with pre-basic or basic seed it is better to count, but if seed is produced on a large-scale e.g. Quality Declared Seed (QDS),

weight might be easier. There is need to estimate how many cuttings are in one kilogram of each variety.

Research gaps

1. There is need for country-specific studies to find out the optimal number of ratoons as per the local conditions.
2. Effect of ratooning on root production (synchronised ratoons planted at the same time).
3. Estimate the number of cuttings that can weigh 1 kg. This should be done per variety.

In the discussion, it emerged that there was data on the effect of ratooning on overall storage root yield. It showed that ratooning before 90 days had a negative effect on yield but after 90 days it does not. It was clear that there was need for a study to synchronise ratooning e.g. five different trials and evaluate the ratoons for root and vine yield at the same time to keep the factors constant.

4.5 Topics for online discussion

Between March and December 2015, the Seed Systems and Crop Management CoP held eight online discussions, whose duration ran from 8-28 days and the number of contributions ranged from 13-38. The most active was topic 8, titled *sweetpotato seed system enterprise models and competitiveness* and moderated by Antony Masinde (FCI). The discussion had 38 contributions from 11 countries.

Meeting participants suggested the following topics and leaders. Those that are underlined were agreed on by participants. The discussion leaders will refine the topics.

1. Reducing perishability of vines during transport and handling (Jan Low)
2. Value addition to sweetpotato seed for shelf-life improvement, branding, packaging, etc. (Rogers Kakuhenzire)
3. Linking of key actors in the sweetpotato seed value chain (Wilfred Mushobozi) (This topic may be combined with No. 4 and No. 5)
4. In the long run, shall we need middlemen in the sweetpotato seed marketing? (David Talengera)
5. Strengthening public/private partnerships for enhancing vine marketing (Sammy Agili)
6. Fast tracking the seed certification process (Bramwel Wanjala)
7. Free seeds distribution: opportunity or illusion? (Some Koussao)
8. Should we continue to promote sweet potato as a nutrition crop or should we promote as a crop for food security and a mainstream staple? (Richard Gibson) (Proposed as a cross CoP discussion)

Sweetpotato Knowledge Portal orientation

To prepare for the meeting, participants had been requested to register as members to the portal, and to bring with them content, such as files, photographs and project information, to add to the portal during the hands-on training.

Due to poor internet connection and the limited amount of time allocated to the training, a full training could not be conducted. Instead, an orientation of the following was done:

- Introducing the new features on the portal;
- How to upload files, add the metadata, external links, projects, news items and events;
- Join discussion fora and conduct searches.

Evaluation

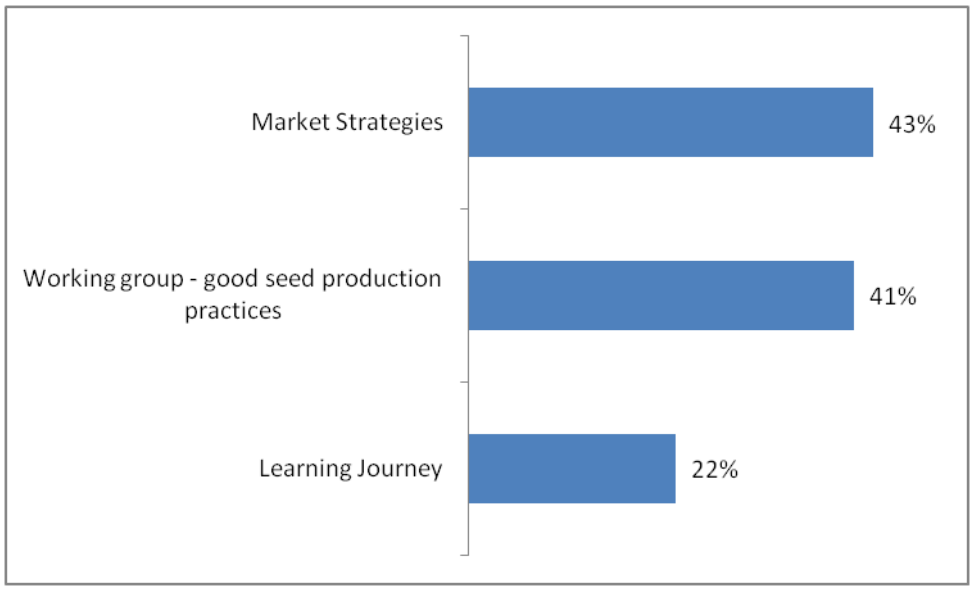
The evaluation was done by 37 participants. At the end of the meeting, participants were asked to fill out questionnaires to provide feedback that would help improve the usefulness of future meetings. The meeting was predominantly attended by men who made up 73% of the total participants. The average age of participants was 37 years. Nearly 90% of the participants were from research organisations.

Feedback on the meeting proceedings: 49% of participants expressed their satisfaction with the content. 38% thought it was very good. 87% of them rated the learning journey as either good or very good. Participants appreciated the effectiveness of the learning journey the activities related to marketing strategies and good seed production practices. They found it effective. A vast majority of participants (92%) rated the quality and usefulness of the day one working group on marketing strategies to be either good or very good. The usefulness of the day three working group on good seed production practices was rated very highly by 81% participants.

Expectations: Majority of the participants (73%) felt that by the end of the three days' meeting, all their expectations were fulfilled completely. 24% felt that most of their expectations had been met. An overwhelming majority of participants (92%) expressed satisfaction with regard to meeting arrangements.

Learning outcome from the meeting discussion: The topic on market strategies topic held on the first day of the program was rated as the most useful by 43%, followed by working group discussion on good seed production practices (41%). 22% of participants found learning journey approach to field trip participation to be most useful.

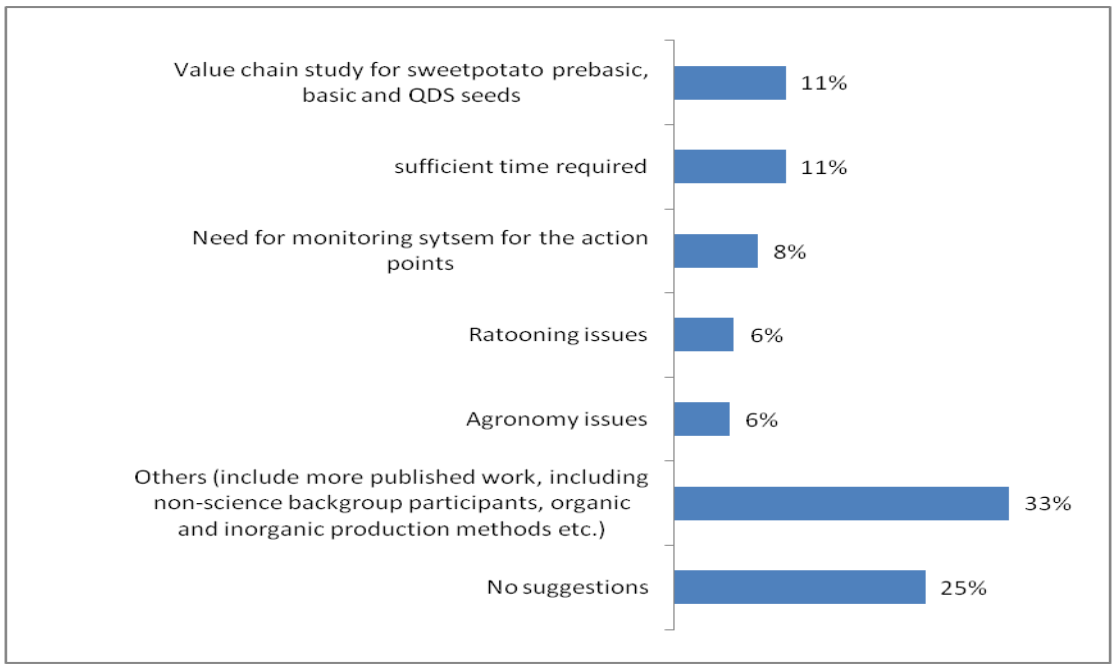
Figure 6: The most useful session according to participants' evaluation



Furthermore, participants were found to have learnt new things from the meeting such as business opportunities for tissue culture, agronomic practice, Triple S techniques and use of *Vapour Guard* to extend self-life of the vines.

Suggestions for improving the scope of future meetings: Value chain study for sweetpotato pre-basic, basic and QDS seeds was suggested by 11% of the participants. Another 11% expected more time to be allocated for discussion in future meetings. Eight percent stressed on the need for putting in place monitoring system for the action points. Detailed discussions on ratooning and agronomy issues were suggested by 6% each.

Figure 7: Participants' suggestions for improvement of future meetings



Annexes

Annex 1: "100 Best Bets"

Sr	Clone	Country	Score
1	Safaré	Burkina Faso	8
2	Nakalbo	Burkina Faso	9
3	Pepiris	Burundi	9
4	Mugamba	Burundi	12
5	Camp1	Cote d'Ivoire	9
6	Gbossolom Vihou	Cote d'Ivoire	9
7	Safo Fiou	Cote d'Ivoire	9
8	Azag3	Cote d'Ivoire	10
9	Camp3	Cote d'Ivoire	10
10	TIB	Cote d'Ivoire	10
11	Kulfo (LO-323)	Ethiopia	10
12	Tulla (CIP-420027)	Ethiopia	10
13	Awassa-83	Ethiopia	12
14	CRI-Patron	Ghana	9
15	Faara	Ghana	9
16	Obare	Ghana	9
17	Okumkom	Ghana	9
18	Santom Pona	Ghana	9
19	CRI-Apomuden	Ghana	10
20	CRI-Dadanyuie	Ghana	10
21	CRI-Ligri	Ghana	10
22	Nanungungu	Ghana	10
23	Blue Blue	Ghana	11
24	TU-Purple	Ghana	11
25	Kenspot 5	Kenya	11
26	Kenspot 4	Kenya	12
27	Galona / Sihanaka	Madagascar	9
28	Naveto	Madagascar	10
29	Mendrika	Madagascar	11
30	Nyamoyo	Malawi	9
31	Sakananthaka (LU96/303)	Malawi	9
32	Sungani	Malawi	9
33	Chipika	Malawi	10
34	Kadyaubwerere	Malawi	10
35	Anaakwanire	Malawi	11
36	Kaphulira	Malawi	11
37	Mathuthu	Malawi	12
38	Zondeni	Malawi	12
39	Bie	Mozambique	9
40	Caelan	Mozambique	9
41	Ivone	Mozambique	9

42	Lawrence	Mozambique	9
43	Victoria	Mozambique	10
44	Alicia	Mozambique	11
45	Anna-Marie	Mozambique	11
46	Bita	Mozambique	11
47	Esther	Mozambique	11
48	199062.1	Mozambique	12
49	Bela	Mozambique	12
50	Cecilia	Mozambique	12
51	Erica	Mozambique	12
52	Jane	Mozambique	12
53	Lourdes	Mozambique	12
54	Melinda	Mozambique	12
55	Namanga	Mozambique	12
56	Sumaia	Mozambique	12
57	Tio Joe	Mozambique	12
58	Amelia	Mozambique	13
59	Delvia	Mozambique	13
60	Ininda	Mozambique	13
61	Irene	Mozambique	13
62	TIS 2532.OP.1.13	Nigeria	9
63	Butter Milk	Nigeria	10
64	Ex-Igbariam	Nigeria	10
65	TIS 8164	Nigeria	11
66	TIS 87/0087	Nigeria	11
67	UMUSPO/3 (Mother's Delight)	Nigeria	12
68	UMUSPO/1 (King J)	Nigeria	13
69	Ndamirabana (RW11-2910)	Rwanda	9
70	Kwezikumwe	Rwanda	10
71	Terimbere (RW11-2560)	Rwanda	10
72	97-062 (Gihingamukungu)	Rwanda	11
73	Bophelo	S. Africa	10
74	Impilo	S. Africa	10
75	Monate	S. Africa	11
76	Blesbok	S. Africa	12
77	Kabbia	Sierra Leone	9
78	Slipot1	Sierra Leone	9
79	Slipot2	Sierra Leone	9
80	Slipot3	Sierra Leone	9
81	Slipot4	Sierra Leone	9
82	Kiegea	Tanzania	11
83	Polista	Tanzania	11
84	Ukerewe	Tanzania	12
85	New Kawogo	Uganda	10
86	Ejumula	Uganda	11
87	NASPOT 9 O (Kabode)	Uganda	11

88	Tanzania (SPNO)	Uganda	11
89	Dimbuka-Bukululа	Uganda	12
90	NASPOT 1	Uganda	12
91	NASPOT 10 O (Vita)	Uganda	12
92	NASPOT 11	Uganda	13
93	NASPOT 12 O	Uganda	13
94	NASPOT 8	Uganda	13
95	NASPOT 13 O	Uganda	14
96	15/1 (Olympia)	Zambia	10
97	Chumfwa	Zambia	10
98	Kokota	Zambia	11
99	Twatasha	Zambia	11
100	Orange Chingovwa (Chiwoko)	Zambia	12

Annex 2: Agenda

Sweetpotato for Profit and Health Initiative-
Regional Technical Support Platform for East, Central and Southern Africa
Sweetpotato Seed Systems Community of Practice: Fifth Consultation- Marketing Strategies for Quality Sweetpotato Seed. Arusha, Tanzania
10 -12th May, 2016 AGENDA

TIME	SESSION	Responsible
Monday 9th May: Arrival of CoP participants		
15.00 – 17.30	**Sweetpotato Knowledge Portal Training**	**Christine Bukania**
Tuesday 10th May		
8.00 – 8.15	**Registration**	Tassy Kariuki & Wendy Lymo
8.15 – 8.30	**Opening, introductions and objectives of meeting**	Kiddo Mtunda, Wilfred Mushobozi, and Margaret McEwan
Session 1: Marketing Strategies for Quality Sweetpotato Seed Moderator: **Kiddo Mtunda.** Rapporteur: Christine Bukania		
8.30 – 9.00	**Keynote: Building business and marketing strategies with cassava seed entrepreneurs: lessons for sweetpotato seed entrepreneurs**	Co-presentation: Peter Pacific & Stephen Magige **(MEDA Tanzania)**
9.00 – 9.30	**Marketing Strategies used by informal multipliers: sharing lessons from Northern Uganda and Tanzania** (Sweetpotato vines commercialisation in areas with a long dry season project)	Co-presentation: Stephen Kaule, Gration Rwegasira, Everina Lukonge, Richard Gibson **(Sweetpotato Vine Commercialisation in dry areas project)**
9.30 – 10.00	**SeFaMaCo Sweetpotato Seed Enterprise Model**	Presenter: Harold Mate **(FCI Africa Office)**
10.00 – 10.30	**Sweetpotato Seed Marketing Strategies: experiences from the private sector**	Presenter: Wilfred Mushobozi **Crop BioScience**
10.30 – 11.00 Group photo and tea/coffee break		
11.00 – 12.30	**Group work: improving our marketing strategies**	**5 groups led by:** **a.** Peter Pacific, Gration Rwegasira, Srini Rajendran Stephen Kaule and Harold Mate
12.30 – 13.00	**Plenary feedback**	3 groups x 10 minutes
13.00 – 14.00 Lunch		
14.00 – 14.30	**Plenary feedback**	2 groups x 10 minutes, plus discussion
Session 2: Novel methods and new findings. Moderator: **Jude Njoku** Rapporteur: Christine Bukania		
14. 30 – 14. 45	**Keynote: Novel Delivery Strategies for Sweetpotato Seed: experiences from Fast Track**	Co-presentation: Kiddo Mtunda, Everina Lukonge and Gorrettie Ssemakula (Fast Track Project)
14.45 – 15.00	**Learning from HarvestPlus Uganda:** Are Uganda bred OFSP varieties competitive & what seed system innovations are emerging?	Co-presentation: Charles Musoke, Sam Namanda (HarvestPlus) and Robert Mwanga (CIP-Uganda)
15.00 – 15.15	**Plenary discussion**	
15.15 – 15.30	**Increasing vine production – fertiliser rates** (Tanzania & Uganda)	Co-presentation: Stephen Kaule, Gration Rwegasira, Everina Lukonge, Richard Gibson **(Sweetpotato Vine Commercialisation in dry areas project)**
15.30 – 15.45	**Increasing vine production – fertiliser rates** CSIIR-SARI: Ghana	Issah Abukari **(CSIR-SARI)**

TIME	SESSION	Responsible
15.45 – 16.00	Plenary discussion	
16.00 – 16.15 Tea/Coffee break		
16.15 – 16.30	**"100 best bet"** sweetpotato varieties for SSA	Robert Mwanga (CIP-Uganda)
Session 3: Preparation for the Learning Journeys. Moderator: Margaret McEwan. Rapporteur: Christine Bukania		
16.15 – 16.35	**Presentation by Tanzania Horticultural Association (TAHA)**	Jacqueline Mkindi (CEO – TAHA)
16.35 – 17.35	**Preparation for learning journeys**	**Margaret McEwan**
17.35– 17.45	**Wrap up and arrangements for Learning Journeys**	Tassy Kariuki and Wendy Lymo
DAY 2: Wednesday 11th May: Learning Journeys		
8.15	**Departure**	Tassy Kariuki and Wendy Lymo
9.00 – 10.30	**Visit to CBS tissue culture lab**	Wilfred Mushobozi
10.30 - 13.00	Travel to Moshi and lunch	Tassy Kariuki and Wendy Lymo
13.00 – 15.00	**Visit sweetpotato commercial root producers near Moshi**	Wilfred Mushobozi
15.00 – 16.30	Return to Arusha	Tassy Kariuki and Wendy Lymo
17.00 – 18.00	**Write up learning journey findings**	Groups and Margaret McEwan
Evening event: 19.00 – 21.00		
DAY 3: Thursday 12th May.		
Session 4: Reflections and consolidation of learning. Moderator: **Gorrettie Ssemakula**. Rapporteur: Christine Bukania		
8.00 – 9.15	**Presentations on learning journeys**	Participants
9.15 – 10.30	**Parallel working group sessions on good seed production practices**: a. Triple S b. Sandponics c. Screen house and TC conservation & micro-propagation d. Agronomy and crop management	a. Sam Namanda and Mihiretu Cherinet b. Bramwel Wanjala and Martin Chiona c. Benard Yada, David Talengera and Marian Quain d. Jude Njoku and Kwame Ogero
10.15 – 10. 30 Tea/coffee break		
10.30 – 11.15	Continued working groups	
11.15 – 12.00	Feedback from working groups and plenary discussion	4 groups x 10 minutes
12.00 – 12.30	CoP on line discussion topics, leaders, and transition to SPKP	Christine Bukania
12.30 -13.00	Evaluation and wrap up of CoP meeting	Jan Low
Lunch 13.00 – 14.00		
Thursday afternoon sessions		
14.00 – 16.00	Sweetpotato knowledge portal training	For participants who could not participate on Monday afternoon. **Christine Bukania and Luka Wanjohi**
14.00 – 16.00	**SASHA SGA partners:** review of financial reports and preparation of annual work plans & budgets for June 2016 – May 2017	**Emily Ndoho and Margaret McEwan**
	Participants departure: Thursday evening or Friday morning	Tassy Kariuki and Wendy Lymo

Annex 3: Participants' list

No.	First Name	Last Name	Gender	Title	Institution	Address	Country	Telephone	Mobile	Email Address
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The **Sweetpotato for Profit and Health Initiative (SPHI)** is a 10-year, multi-donor initiative that seeks to reduce child malnutrition and improve smallholder incomes through the effective production and expanded use of sweetpotato. It aims to build consumer awareness of sweetpotato's nutritional benefits, diversify its use, and increase market opportunities, especially in expanding urban markets of Sub-Saharan Africa. The SPHI is expected to improve the lives of 10 million households by 2020 in 17 target countries.

SASHA
Sweetpotato Action for Security and **Health** in **Africa**

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