

EVERYTHING YOU EVER WANTED TO KNOW ABOUT SWEETPOTATO



TOPIC 1

Facilitating Training Sessions

Reaching Agents of Change Training of Trainers (ToT) manual

October 2018



Everything You Ever Wanted to Know about Sweetpotato. Topic 1 - Facilitating Training Sessions

Reaching Agents of Change ToT Training Manual

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This team has brought together and shared their many years of experience of working with sweetpotato systems and farmer learning processes across Sub-Saharan Africa to compile this *Everything You Ever Wanted to Know About Sweetpotato* resource. None of this experience would have been gained without the partnership of many sweetpotato farmers and other stakeholders (extensionists, national researchers, traders, transporters, NGO staff, nutritionists, media and donors) across the region. We thank you, and hope that this resource can in return offer you support in your sweetpotato activities.

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This manual was originally produced as part of the Reaching Agents of Change project in 2013 and updated by the Building Nutritious Food Baskets project in 2017/2018 – both projects funded by the Bill & Melinda Gates Foundation.

Acronyms and Abbreviations

Als	Adequate Intakes
AVRDC	The World Vegetable Centre
BNFB	Building Nutritious Food Baskets
CBO	Community Based Organisation
CIP	International Potato
DAP	Days After Planting
DFE	Dietary Folate Equivalents
DONATA	Dissemination of New Agricultural Technologies in Africa
DVM	Decentralised Vine Multipliers
dwb	Dry Weight Basis
FAO	Food and Agriculture Organisation of the United Nations
FW	Fresh Weight
HH	Household
HKI	Helen Keller International
IBPGR	Bioversity International
IPM	Integrated Pest Management
IPPM	Integrated Pest & Production Management
K	Potassium
LGA	Local Government Areas
M&E	Monitoring and Evaluation
MAP	Months After Planting
m.a.s.l.	Metres Above Sea Level
Mm	Mass Multiplication
MSC	Most Significant Change
N	Nitrogen
NARO	National Agricultural Research Organisation
NGO	Non-Government Organisations
NHV	Negative Horizontal Ventilation
NRI	Natural Resources Institute
OFSP	Orange-fleshed Sweetpotato
P	Phosphorous
PMCA	Participatory Market Chain Approach
PMS	Primary Multiplication Site
PPP	Public Private Partnership
PVC	Polyvinyl Chloride
QDPM	Quality Declared Planting Material

QDS	Quality Declared Seed
RAC	Reaching Agents of Change
RAE	Retinol Activity Equivalents
RCT	Randomised Control Trial
RDA	Recommended Daily Allowances
RE	Retinol Equivalents
REU	Reaching End Users
RH	Relative Humidity
SASHA	Sweetpotato Action for Security and Health in Africa
SMS	Secondary Multiplication Site
SP	Sweetpotato
SPCSV	Sweetpotato Chlorotic Stunt Virus
SPFMV	Sweetpotato Feathery Mottle Virus
SPKP	Sweetpotato Knowledge Portal
SPVD	Sweetpotato Virus Disease
SSA	Sub-Saharan Africa
ToT	Training of Trainers
TMS	Tertiary Multiplication Site
Tshs.	Tanzanian Shillings
TSNI	Towards Sustainable Nutrition Improvement
UNICEF	United Nations Children’s Fund
USD	United States Dollar
Ushs.	Ugandan Shillings
VAD	Vitamin A Deficiency
WAP	Weeks After Planting
WHO	World Health Organisation
WTP	Willingness to Pay

Foreword

During the past decade, interest in sweetpotato in Sub-Saharan Africa (SSA) has expanded, the number of projects utilizing sweetpotato has increased, and the demand for quality training resources, training development practitioners and farmers has subsequently risen. Sweetpotato scientists at the International Potato Center and national research centres often received these requests and frequently held 1-3 day training sessions, drawing on whatever training materials they had or could quickly pull together.

The Reaching Agents of Change (RAC) project in 2011 changed that situation. Jointly implemented by the International Potato Center (CIP) and Helen Keller International (HKI), RAC sought to empower advocates for orange-fleshed sweetpotato (OFSP) to successfully raise awareness about OFSP and mobilize resources for OFSP projects. RAC also sought to build the capacity of public sector extension and non-governmental organizational personnel to effectively implement those projects to promote the dissemination and appropriate use of vitamin A rich, orange-fleshed sweetpotato. The Building Nutritious Food Basket ([BNFB](#)) is a three-year project (November 2015 to October 2018) that followed on from the RAC project. The project is implemented in Nigeria and Tanzania and funded by the Bill & Melinda Gates Foundation. The goal of the project is to accelerate and support scaling up of biofortified crops for food and nutrition security and to help reduce hidden hunger by catalyzing sustainable investment for the utilization of biofortified crops (OFSP, PVA maize, high iron beans and vitamin A cassava) at scale. [BNFB](#) develops institutional, community and individual capacities to produce and consume biofortified crops. The objectives of the project are to strengthen the enabling environment for increased investments in biofortified crops and to develop institutional and individual capacities to produce and consume biofortified crops.

RAC/BNFB goal of developing and revising the Training of Trainers (ToT) manual on *Everything You Ever Wanted to Know About Sweetpotato* was to see *sustained* capacity for training senior extension personnel about the latest developments in sweetpotato production and utilization in each of the major sub-regions of SSA: Eastern and Central Africa, Southern Africa, and West Africa. Hence, CIP identified local institutions to work with in Mozambique, Tanzania, and Nigeria to host an annual course entitled: *Everything You Ever Wanted to Know About Sweetpotato*. The course has progressed from initially having CIP scientists working closely with national scientists to implement it, to national scientists and partners independently organising and conducting the course. In subsequent years, institutions in Burkina Faso, Ethiopia, Ghana, Malawi and others have been capacitated in conducting the course.

In developing the course content, a long-time collaborator of CIP, Tanya Stathers of the Natural Resources Institute (NRI), University of Greenwich, worked with CIP Scientists to review the existing training material, added in new knowledge from sweetpotato scientists and practitioners, and designed the course with a heavy emphasis on learning-by-doing. The CIP personnel who contributed to the development of the initial manual include, (Robert Mwanga, Ted Carey, Jan Low, Maria Andrade, Margaret McEwan, Jude Njoku, Sam Namanda, Sammy Agili, Jonathan Mkumbira, Joyce Malinga, Godfrey Mulongo), Adiel Mbabu and HKI nutritionists (Margaret Benjamin, Heather Katcher, Jessica Blankenship) and an HKI gender specialist (Sonii David) as well as NRI colleagues (Richard Gibson, Aurelie Bechoff, Keith Tomlins). Some of the materials were adapted from the DONATA project training materials, the Reaching End Users project and many others. After practitioners had used the course and the manual, a review was held in 2012 and the manual and course were subsequently updated, and a standard set of accompanying Power Point presentations created. In 2017-2018, the Building Nutritious Food Baskets project led a further review of the manual working closely with Tanya Stathers, the above mentioned CIP teams again plus Robert Ackatia-Armah, Kwame Ogera, Srinji Rajendra, Julius Okello, Fred Grant, Joyce Maru, Hilda Munyua and Netsayi Mudege to update the content of topics 3, 4, 5, 12 and 13 which cover: sweetpotato varietal selection; nutrition; seed systems; monitoring, learning and evaluation; and using the 10 and 5 day ToT course.

This manual is designed to potentially serve a wide variety of audiences (nutritionists and agronomists, policymakers, extension workers, community development workers, leaders of farmer organizations, farmers etc.). Not all the materials will be relevant to all audiences, but facilitators can adapt the content to their audience and facilitation best practices. To ensure sustainability and wide reach; a cascading approach in the delivery of training is recommended; where key experts (agriculturalists, nutritionists, health workers, marketing and gender experts) will attend more detailed ToT workshops. The experts trained will then become primary facilitators and drive the agenda for OFSP. This group will in turn deliver shorter version courses and step-down the training to various levels of audiences (secondary and tertiary) – based on needs identified. This trend will continue until the training cascades down to “farmer trainers” who finally train the end users in their communities.

The original version of the manual has also been translated into Swahili, French, Portuguese, and Amharic are available online at <https://www.sweetpotatoknowledge.org/learn-everything-you-ever-wanted-to-know-about-sweetpotato/> with the intension of translating the revised chapters as soon as resources permit. We envision the course to continue to be improved as new knowledge comes in. In this way, we expect the vibrant and knowledgeable sweetpotato community of practice to continue to grow in the coming years. The *Everything You Ever Wanted to Know About Sweetpotato* course will help us to achieve the major objectives of the Sweetpotato Profit and Health Initiative (SPHI). Launched in October 2009, the SPHI seeks to improve the lives of 10 million sub-Saharan African families in 16 countries by 2020 through the diversified use of improved sweetpotato varieties.



Jan W. Low, Leader of the Sweetpotato for Profit and Health Initiative, International Potato Center
October 2018, 2nd edition.

How to Use This Manual

This guide is part of the series, Everything You Ever Wanted to Know About OFSP.

The materials are designed to be used in two ways:

- As self-study material, or
- As a facilitator's guide for classroom training sessions

For each topic we have provided a **handbook** and a **PowerPoint presentation**

If you plan to deliver this as classroom training, then we would encourage you to read the guidance in this section prior to planning your lessons.

We hope that it will be useful for those involved in training extensionists and NGO staff at different levels, and that they in turn will train farmers in practical ways that help them to build their problem solving and decision-making skills so they can continue to learn, question, test and address different opportunities and challenges relevant to their livelihoods.

The manual consists of twelve topics which, after the initial two topics on 'Helping Adults to Learn and the 'Origin and Importance of Sweetpotato', follow the sweetpotato crop cycle. Each topic discusses the key need-to-know aspects highlighting the relevant gender issues and then presents suggestions for how this topic might be incorporated in a 10-day ToT course, with step-by-step guidelines for several hands-on learning-by-doing activities. The learning outcomes and key points for the topics are highlighted, and a number of self-assessment exercises are included with answers given at the end of the topic. The twelve topics are:

1 Helping Adults to Learn discusses the characteristics of good facilitators, and provides suggestions to help improve one's facilitation skills. It covers how to plan a training course from the needs assessment, through the development of learning outcomes, awareness raising, participant selection, development of the programme, use of discovery-based/experiential learning approaches, follow-up and long-term monitoring and scaling up and out. The learning-by-doing activities involve the participants practicing their facilitation skills while delivering different sweetpotato topics and understanding the importance of evaluating their training.

2 Origin and Importance of Sweetpotato describes the historical origins and spread of sweetpotato and presents an overview of the current uses of and production figures for sweetpotato across the world.

3 Sweetpotato Varietal Selection and Characteristics. Sweetpotato roots range in colour from purple to orange to yellow or white. A wide diversity of leaf shapes, root sizes and shapes, tastes, textures, maturity periods and flesh colours also exist. Farmers use such characteristics to select which varieties to grow. A method for comparing the different characteristics of different varieties on-farm is described.

4 Nutrition and Orange-fleshed Sweetpotato. The meaning and importance of good nutrition is described, followed by discussion of the different ways we can be malnourished, and the causes, consequences, costs and prevalence. The types, sources and functions of the different macro and micro nutrients are reviewed. The various ways of tackling micronutrient malnutrition including biofortification are compared. The nutritional benefits of orange-fleshed sweetpotato are discussed along with the symptoms and consequences of vitamin A deficiency. The role of nutrition-sensitive agricultural interventions for amplifying agriculture's contribution to nutrition is explored, and examples of successful nutritional behaviour change and nutritional awareness raising initiatives are shared.

5 Sweetpotato Seed Systems and the factors that influence them are discussed, including the gender and diversity dimensions. The need to use clean planting materials along with the different methods for identifying, sourcing and multiplying them are explained. The factors influencing decisions on whether to use a single shot or an ongoing planting material multiplication dissemination approach, and the level of subsidisation required are discussed. Calculation tables are given to help in planning and costing different types of planting material multiplication and dissemination strategies. Key considerations for scaling seed systems are described.

6 Sweetpotato Production and Management covers the importance of advanced planning to ensure sufficient planting materials are available at the start of the rains, land preparation, planting methods, intercropping, nutrients needs, the main growth stages and their associated management tasks.

7 Sweetpotato Pest and Disease Management explains how recognising the lifecycles of the damaging insect pests and diseases such as the sweetpotato weevil (*Cylas* spp.) and viruses can help farmers learn how to manage them more successfully. The signs and management strategies for mole rats and erinose are also discussed.

8 Harvesting and Postharvest Management. The physical damage caused during harvest and transport can reduce the shelf-life and value of sweetpotato roots. Over-drying and prolonged storage can reduce the beta-carotene content of dried orange-fleshed sweetpotato products. Good postharvest handling and storage practices for dried products are discussed, and methods for curing and storing fresh roots to increase their quality, value and availability are presented.

9 Processing and Utilisation. Many delicious, nutritious and potentially profitable food products can be prepared from orange-fleshed sweetpotato. The use of sweetpotato as animal feed is also discussed.

10 Marketing and Entrepreneurship. The concepts of marketing, market orientation, entrepreneurship, and the 5 pillars of marketing (product, price, price, promotion and people) are discussed in relation to fresh sweetpotato roots and sweetpotato products.

11 Gender and Diversity Aspects. The importance of recognising gender and diversity issues in agriculture and sweetpotato systems is discussed. Situations where sweetpotato is grown as a female crop, and others where it is grown as a male crop, or grown by both men and women are presented along with the different constraints, needs and priorities of female and male farmers. Best practice suggestions are made for how gender can be incorporated into sweetpotato programmes.

12 Monitoring, Learning and Evaluation of Sweetpotato Projects. The concepts of and reasons for monitoring, learning and evaluation are introduced. A range of sweetpotato project monitoring tools for use in monitoring the dissemination and performance of sweetpotato planting materials are presented. These are followed by a set of tools for monitoring who has been trained to help in understanding the long-term impacts and reach of sweetpotato training. These records can be used for follow-up activities. Evaluation mechanisms are also discussed.

User Feedback and Reflections

We hope that after field testing this manual trainers and participants will reflect on it and share their ideas for how it could be improved. Please send any suggestions you have to Jan Low j.low@cgiar.org and where possible we will incorporate them into new editions.

Unit 1 – Adapting the Materials for Your Specific Audience

The modules in this series have been designed to potentially serve a wide range of audiences, including:

- Agriculturalists and nutritionalists
- Policymakers
- Government and NGO agricultural extension workers
- Farmers and other stakeholders in agricultural value chains

Not all the material included in the modules will be relevant for all these groups. Therefore, you are strongly encouraged to:

- **REVIEW THE PRESENTATION MATERIALS** in advance and add, remove or edit slides or sections as necessary to better suit the specific needs, interests and knowledge level of your intended audience
- **REHEARSE THE PRESENTATION** in advance to confirm that you will be able to cover the most important concepts in the time allotted, with adequate time left over for discussions and activities
- **PRACTICE THE ACTIVITIES** with your colleagues before delivering the training, to confirm that you understand how to deliver them and know what supplies/materials you will need to bring on the day of training

Summarised Programme for the 10 Day ToT 'Everything You Ever Wanted to Know About Sweetpotato' Course

Topics	Learning Objectives	Activities
<p>Day 1</p> <p>Facilitators Guide (Topic 1)</p> <p>Origin and Importance of Sweetpotato (Topic 2)</p> <p>Gender and Diversity Aspects (Topic 11)</p>	<p><i>Participants will:</i></p> <ul style="list-style-type: none"> • Understand the course programme and how it aims to prepare them for training others on sweetpotato • Know about trends and challenges in sweetpotato production and use • Understand how gender issues are relevant throughout the sweetpotato value chain 	<ul style="list-style-type: none"> • <i>Introductions</i> • <i>Entry test: [30 mins] (Appendix 1.1)</i> • <i>Presentation 2. Origin and Importance of sweetpotato & group discussion. [45 mins]</i> • <i>See Activity 2.1</i> • <i>Presentation 11. Gender and diversity and how it is relevant for sweetpotato activities.</i> • <i>See Activity 11.1</i>
<p>Day 2</p> <p>Different Varieties of Sweetpotato and Their Characteristics (Topic 3)</p>	<ul style="list-style-type: none"> • Understand key differences between sweetpotato varieties • Know about the key characteristics of at least 3 sweetpotato varieties suitable for their area/ region • Be able to help farmers identify the key characteristics they are looking for in a sweetpotato variety • Understand that varietal preference differs between people • Be introduced to why care during harvesting is important for sweetpotato • Know how to conduct a variety ranking test (using red, yellow and green cards) • Be experienced in conducting a taste test 	<ul style="list-style-type: none"> • <i>Presentation 3. Natural diversity of sweetpotato; defining characteristics of different sweetpotato varieties; and methods for on-farm testing of different sweetpotato varieties and discussion. [45 mins]</i> • <i>See Activities 3.1 through 3.3</i>
<p>Day 3</p> <p>Nutrition and OFSP (Topic 4)</p>	<ul style="list-style-type: none"> • Understand what a balanced diet is and why it is important • Know how OFSP can contribute to reducing Vitamin A deficiency • Be able to select appropriate local ingredients to prepare child-friendly, and nutritious OFSP meals • Understand the importance of the gender aspects of 	<ul style="list-style-type: none"> • <i>Presentation 4. Nutrition and Orange-fleshed Sweetpotato</i> • <i>See all Activities 4.1 through 4.5</i>

	household nutrition	
<p>Day 4</p> <p>Selecting, Preserving and Multiplying Sweetpotato Planting Materials (Topic 5)</p>	<ul style="list-style-type: none"> • Be able to identify, select and conserve clean sweetpotato planting materials • Know about the principles of positive and negative selection and preservation of sweetpotato planting materials • Understand how to calculate vine multiplication rates and how varieties rates' differ 	<ul style="list-style-type: none"> • <i>Activity in manual topic 5: Vines for planting: clean and multiplied.</i> • <i>Presentation 5 Part 1. Sweetpotato Seed Systems, Units 1 through 7.</i> • <i>Activity 5.2 The Triple S system.</i> • <i>Additional activities: Net tunnel (see Appendix 5.2) or tissue culture plantlets (see Appendix 5.1)</i>
<p>Day 5</p> <p>Sweetpotato Pests and Diseases and Their Management (Topic 7)</p>	<ul style="list-style-type: none"> • Be able to find field examples of the key pests and diseases of sweetpotato and explain and show the damage each can cause. • Know a range of practical techniques for managing these key pests and diseases. 	<ul style="list-style-type: none"> • <i>Activity 7.1: Field hunting for sweetpotato pests and diseases and learning how to manage them.</i> • <i>Presentation 7, Sweetpotato Pest and Disease Management</i> • <i>Activity 7.2: Hidden damage</i> • <i>Activity 7.3: Training Others on Key Sweetpotato Pests and Diseases.</i>
<p>Day 6</p> <p>Sweetpotato Production and Crop Management (Topic 6)</p>	<ul style="list-style-type: none"> • Be able to help farmers set up a field experiment to compare different varieties or management practices. • Understand the different stages of the sweetpotato crop cycle and the management implications of each stage. 	<ul style="list-style-type: none"> • <i>Activities 6.1 and 6.2</i> • <i>Presentation 6. Sweetpotato crop cycle.</i>
<p>Day 7</p> <p>Planning a Planting Material Dissemination Program (Topic 5)</p> <p>Monitoring Learning and Evaluation (Topic 12)</p>	<ul style="list-style-type: none"> • Understand all of the key steps, and bottlenecks that may emerge in planning a mass multiplication or DVM approach dissemination exercise • Practice designing a dissemination program for their area to reach 5000 households • Understand why it is important to monitor and evaluate activities • Practice monitoring the dissemination of planting materials 	<ul style="list-style-type: none"> • <i>Presentation Part 2. Sweetpotato Seed Systems, Units 8 through 12.</i> • <i>Activity 5.3: Planning your multiplication and dissemination strategy. Practical</i> • <i>Activity 5.4: Working with DVMs.</i> • <i>Presentation 12. Introducing M&E.</i> • <i>Activity 12.1: Where did it go? M&E practice.</i>
<p>Day 8</p>	<ul style="list-style-type: none"> • Know about the main aspects of sweetpotato harvesting, post-harvest management and processing. 	<ul style="list-style-type: none"> • <i>Activities 8.1 and 8.2</i> • <i>Presentation 8. Harvesting & Post-harvest Management.</i> • <i>Activities 9.1 through 9.3</i>

<p>Harvesting, Post-Harvest Management, and Processing (Topic 8)</p> <p>Processing and Utilisation (Topic 9)</p>	<ul style="list-style-type: none"> • Understand how the processing and storage of OFSP affects beta-carotene content. • Understand the importance of involving different groups in processing training and awareness. 	<ul style="list-style-type: none"> • <i>Presentation 9. Processing.</i>
<p>Day 9</p> <p>Marketing and Entrepreneurship (Topic 10)</p>	<ul style="list-style-type: none"> • Be familiar with the concepts of marketing and market orientation • Understand the 5 pillars of marketing • Understand the opportunities and challenges in sweetpotato fresh root and processed product marketing • Explore gender issues along the value chain • Be aware of how to select an appropriate processed product • Know how to calculate marketing margins for fresh roots and processed products 	<ul style="list-style-type: none"> • <i>Activities 10.1 through 10.3</i> • <i>Presentation 10. Marketing and entrepreneurship.</i>
<p>Day 10</p> <p>Planning to Train Others On ‘Everything You Ever Wanted to Know About Sweetpotato’</p>	<ul style="list-style-type: none"> • Understand and have developed the draft learning outcomes and approaches, training materials and draft logistics plans (timing, venue and field sites, participants) of the sweetpotato training courses they will be delivering • Be able to deliver a 5 day training course on ‘Everything you Ever Wanted to Know About Sweetpotato’ 	<ul style="list-style-type: none"> • <i>Practising being learning-by-doing facilitators.</i> Practice in facilitating a key sweetpotato topic, and group work on the principles of giving and receiving constructive feedback. • <i>Training Action Plan:</i> Practice applying the new knowledge and skills learned. Participants will draft logistics planning for their delivery of training others (see Appendix 1.2) [1hr] • <i>Ideas for additional sweetpotato learning-by-doing activities.</i> (Activity in Unit 8) [1hr 20 mins] • <i>Evaluating a training course.</i> Course evaluation (option to repeat sweetpotato knowledge test as exit test (Appendix 1.1)) [1hr] • Presentation of certificates for completing course [1hr]

Advanced Preparations Required for the 10 Day ToT Course

Advanced preparations:	Suggested time frame for advanced preparations before the ToT course						
	6 months before	5 months before	4 months before	3 months before	2 months before	1 month before	1 week before
Selection of and contact with facilitators							
Advertising ToT course							
Planning the field preparations required (see list below)							
<i>Activity in manual topic 3: Spot the difference.</i> Identify or plant a nearby field (near to the training centre with several sweetpotato varieties in it, some roots and leaves of which can be harvested by participants during the course. Meet the farmer to discuss and plan.		Plant or plan		Monitor		Monitor	Monitor
<i>Activity in manual topic 5: Vines for planting: clean and multiplied.</i> Identify a nearby field which is likely to have virus and weevil problems at the time of the ToT course, and where participants can take vine cuttings.				Identify		Monitor	Monitor
<i>Activity in manual topic 5:</i> Set up a nearby rapid multiplication plot planted with cuttings of two varieties with very different multiplication rates, e.g. 1sqm (50 cuttings) of Variety A, 1 sqm (50 cuttings) of Variety B. Participants will harvest the cuttings.				Identify location	Set-up	Monitor	Monitor
<i>Activity in manual topic 5:</i> Prepare half a rapid multiplication bed at the field, so the participants can complete it and then practice planting out the cuttings they have taken, shading, and watering it.							Set-up
<i>Activity in manual topic 5: The Triple S system.</i> Set up a Triple S system, so that during the course the students can uncover the roots and find them sprouting and can then use them to practice planting them out.					Set up	Monitor	Monitor
<i>Activity in manual topic 5: Working with DVMs.</i> Locate or plant two nearby sweetpotato plots with two varieties planted separately in each. Rogue one to remove any diseased material, leave the other plot in the hope that virus infection and symptoms occur.		Plant or plan		Rogue 1 plot		Monitor	Monitor
<i>Additional activities topic 5:</i> If you plan to construct a net tunnel (Appendix 5.2.4) or practice hardening off tissue cultured plantlets (Appendix 5.1) you will need to make the appropriate advanced preparations (materials, space etc.).						Plan & set up	Monitor
<i>Activity in manual topic 6: Comparing sweetpotato varieties and management practices.</i> Identify an empty field area (~30m x 30m) where participants can practice designing and setting up a field trial.						Identify	Monitor

Advanced preparations:	Suggested time frame for advanced preparations before the ToT course						
	6 months before	5 months before	4 months before	3 months before	2 months before	1 month before	1 week before
<i>Activity in manual topic 7: Field hunting for sweetpotato pests and diseases and learning how to manage them.</i> Identify three nearby sweetpotato fields, i) a young crop with SPVD in it, ii) a field which previously had sweetpotato in it, iii) a mature or old sweetpotato crop. Which participants can explore and compare for pests and diseases.		Plant or plan		Monitor		Monitor	Monitor
<i>Activity in manual topic 7: Hidden damage.</i> Collect ~30 weevil infested roots and handle carefully so that participants can dissect them during the ToT.						Collect roots	Monitor
<i>Activity in manual topic 8: Increasing profits through storing fresh sweetpotato roots.</i> Identify or plant a nearby sweetpotato plot that the trainees can harvest in order to calculate yield.		Plant or plan		Monitor		Monitor	Monitor
<i>Activity in manual topic 8: Effect of sun-drying and storage on beta- carotene content of OFSP.</i> Prepare the OFSP roots and chips for sun-drying for different durations as described.							Prepare OFSP
<i>Activity in manual topic 10: Market trip.</i> Make a pre-visit to nearby markets with the checklist, to decide which market enables better learning by participants regards factors affecting both fresh root and processed product marketing. Organise transport for ToT market trip.						Pre-visit & book transport	
Immediate response by organisers to interested course participants and include a short needs assessment style survey.							
Facilitator familiarisation with training manual, suggested approach, activities and presentations and course programme and dates (could combine with a pre-training course).							
Reminder to all the facilitators about the ToT programme and the dates they will be required on.							
Finalise list of course participants and send them details of the course programme, venue and directions.							
Send facilitators summary list of the participants and their backgrounds and perceived needs							
Preparation of all learning-by-doing activity materials, equipment and ingredients for ToT course (see far right column of 10-Day Programme for details).							
Contact with all the facilitators reminding them about the ToT programme and dates they will be required.							
Preparation of all stationery, p/copying, badges, accommodation and meal arrangements, certificates.							

Unit 2 – Helping Adults to Learn

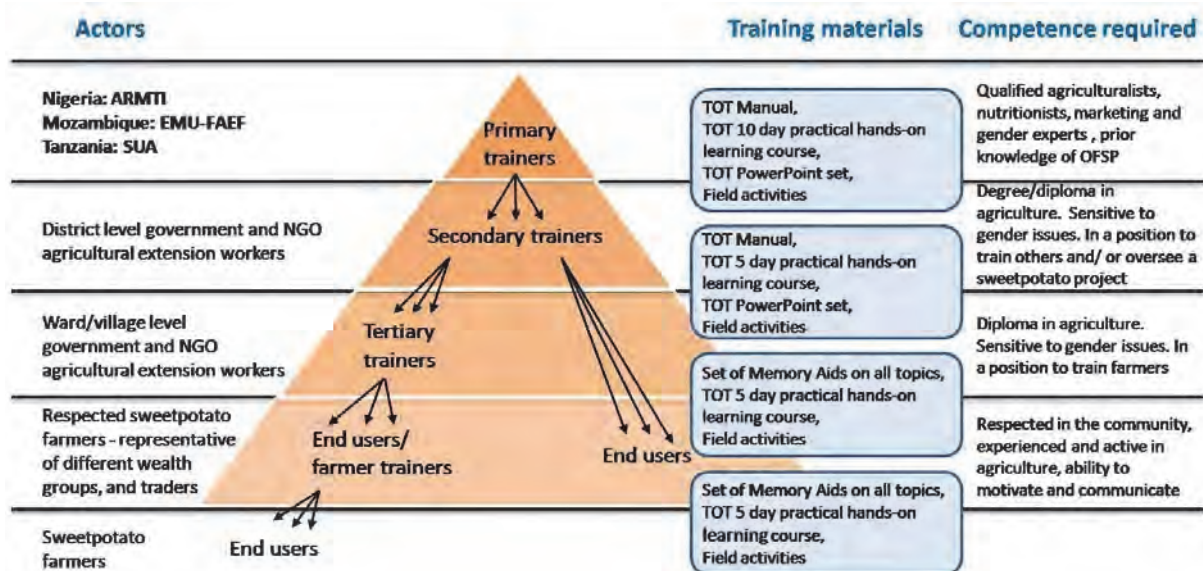
Pre-training Needs Assessment, Learning Objectives, and Stakeholder Awareness Raising

Aims: The Reaching Agents of Change (RAC) project’s overall aims for this ‘Everything you Ever Wanted to Know About Sweetpotato’ training course and manual are: to build the capacity of implementing agencies to implement technically strong cost-effective interventions that drive uptake of orange-fleshed sweetpotato.

Geographically RAC is initially focusing on three key sweetpotato producing countries in Years 1 and 2 (2012 and 2013): Nigeria, Tanzania and Mozambique, and within those countries on the main sweetpotato producing areas. In subsequent years it will include Ghana and Burkina Faso though to a lesser extent.

Before starting any training, it is important that an assessment of the target audiences’ training needs is done. This helps tailor the training to the participants’ needs, making it as relevant, interesting and useful to them as possible. In the case of the RAC ‘Everything you Ever Wanted to Know About Sweetpotato’ training, there are different types of target audiences (see figure below) e.g. primary trainers (the host training institute identified in each country), secondary trainers (the district level agricultural and nutrition extension and NGO staff), tertiary trainers (the field level extension and NGO staff) and end users (female and male, poor and medium wealth sweetpotato farmers) some of whom will become farmer trainers, and they all have slightly different training needs. The RAC programme will focus on the primary and secondary trainers. These trainers will then train others within their own programmes/ projects.

Overview of The RAC Project’s Training Pyramid, Showing the Different Levels of Trainers



Pre-training needs assessment: Whichever audience group the training is focused on, there is a need to find out what the main constraints to farmers improving their sweetpotato production, utilisation and marketing are currently perceived to be. It is important to discuss this issue with different types of people in the community where the training will take place, e.g. older and younger farmers; female and male farmers; poorer, middle income and wealthier farmers; field and district level government extension officers; field level NGO staff; traders; local leaders; farmer

organisations; and researchers etc. It is also helpful to visit different types of farmers' sweetpotato farms and post-harvest systems so they can show you the actual situation and problems they currently face. These discussions can be done with focus groups and/or individuals using semi-structured checklists, or a questionnaire could be developed and may form part of the baseline monitoring system of the project as well as the training needs assessment.

While gaining an overview of the farmers' (end users) sweetpotato knowledge and skills gaps, you can also use a similar approach to identify what the training needs are for the other trainers (tertiary, secondary and primary trainers) who will be helping deliver and scale-out the training activities. Using these findings you can develop your training course's draft learning outcomes to address these knowledge and skill gaps and to help achieve the overall aim. It will still be necessary to verify these draft learning outcomes with the participants at the start of the training programme, but good groundwork is crucial in helping to understand and plan a meaningful training programme, and can save a lot of time and resources.

Learning objectives are broad goals that describe what the learners are supposed to know, understand and/ or be able to do after the learning, e.g. the intended end point after a period of engagement in a specified learning activity.

For example:

At the end of the 'Everything you Ever Wanted to Know About Sweetpotato' training, the tertiary trainers (field level extensionists and NGO staff) are expected to:

- Understand the key aspects of sweetpotato production, utilisation and marketing relevant to their geographical area
- Be able to demonstrate key skills such as: selection and preservation of clean sweetpotato planting materials, how to multiply sweetpotato planting materials in order to have the amounts needed at the right time, sweetpotato crop and pest and disease management, and preparation of different recipes made from sweetpotato
- Know about the importance of good nutrition and vitamin a in the human diet, and foods that can be used to avoid vitamin a deficiency
- Understand how gender roles and responsibilities affect sweetpotato production, utilisation and marketing
- Know how their farmer clients' sweetpotato systems could be improved
- Be able to use learning-by-doing activities in delivering their own sweetpotato training course

Stakeholder awareness raising: To maximise the impact of the training; it is important that in addition to the farmers, key local stakeholders are also aware of the training programme's aims and plans, and recognise in what ways it is relevant to their own goals. The needs assessment will have created an opportunity to meet these key stakeholders, it is important that you keep them updated on plans and activities so that they build ownership and understanding of the training programme from its early stages.

Selection of Participants

In addition to working out *how many* training participants the budget can support, it is necessary to also think carefully about *whom* those participants should be in order to ensure that the benefits from the training are maximised and will continue to bring further benefits within the community.

For the training of secondary or tertiary trainers, the participants should:

- Be active and practising extension or NGO staff;
- Be willing to participate and work in groups;
- Get on well with farmers and other extension or NGO staff and be willing and able to share their training experiences;
- Be selected from a range of social groups, e.g. Gender, age, public/private organisations;
- Be located in a range of different locations across the existing or potential sweetpotato growing areas of the country so that there is a good spatial spread of trainees from whom others can learn.

Similarly, for the end user training, the participants should:

- Be active and practicing farmers;
- Be willing to participate and work in groups;
- Get on well with other farmers and be willing and able to share their experiences;
- Be selected from the targeted social groups, e.g. Gender, age, wealth;
- Ideally, be located in a range of different areas in the community so that there is a good spatial spread of trainees from who other farmers can learn.

Make sure you remember that not all farmers are middle aged, middle income, well educated men! Ensure that the way you design your training programme enables female farmers, young farmers and poor farmers to all benefit from it.

In order to support women's participation we need to ensure that the training programme:

- Is offered equally to women;
- Is designed in such a way that it does not prevent women's attendance (e.g. timing related to women's other household duties, duration);
- Is promoted in such a way that women as well as men can see the opportunities (health, income and labour wise) that will arise from participating in the training;
- Is designed to encourage the involvement and full participation of women from poorer and less educated backgrounds;
- Uses trainers who are not only technically competent and up-to-date, but who are strong facilitators who empathise with the needs and aspirations of women, and do not hold fixed assumptions about gender norms;
- Is designed to provide plenty of practical experiences in the use of sweetpotato knowledge and skills;
- At end user level is designed to ensure resources are used for village-based training and not just residential training;
- Team are aware that for sustainable improvements, not only must benefits be targeted to rural women, but mechanisms have to be developed and put in place to ensure that these benefits can be retained by the intended beneficiaries;
- Team are aware that the addition of participation criteria such as minimum landholding size, literacy and ability to purchase inputs act as potential biases against women and youth participation.

The course should also be attractive to youth who may not own land but who could offer some sweetpotato related services to their communities, and who demographically represent a large percentage of Sub-Saharan Africa's population. It may be necessary to run separate training courses for the poorest households in order to better meet their needs.

Scaling-up and Out the Learning

A training course for 30 participants is an expensive investment, and so it is important to think about how to maximise the impact of that investment. This could be through developing a plan so that those who were trained then train others or share what they learnt with others (scaling out) (see pyramid above), and/or it might involve attracting the attention of regional or national level stakeholders who might be interested in supporting similar training courses in other areas or through their own organisation's activities (scaling up). It is a good idea to ask the training participants to create a 'Training Action Plan' providing details of who they plan to train, what the training will contribute towards, who will fund that training and when it will happen. An example of a training action plan form is given in Appendix 1.2.

Review Questions

1. Who are the different types of trainers?
2. What are some of the criteria to use when selecting participants?

Unit 3 – Training Methodology / Adult Learning Principles

The training materials have been designed to help you, the facilitator, deliver the module in a way that follows adult learning principles and best practices.

While we will provide specific recommendations for facilitating each type of activity later in this guide, the table below provides a high-level synopsis of our recommendations.

Principle	Best Practice	What NOT to do
<p>People process information best when visual aids are used to enhance a presentation</p>	<ul style="list-style-type: none"> • Rehearse the presentation, and familiarize yourself with the slide deck, so you can deliver the training in a natural, conversational style • Face the audience and make eye contact with participants (to whatever extent is culturally appropriate) 	<ul style="list-style-type: none"> • Stare at the screen or your notes and read the text word-for-word
<p>Adults learn best when they take an active role in the learning experience</p>	<ul style="list-style-type: none"> • Engage learners in a dialogue through discussion questions. • Direct questions to specific participants throughout the session 	<ul style="list-style-type: none"> • Lecture for extended periods of time without giving learners a chance to participate in discussions, ask questions and/or engage in activities • Allow one or two highly assertive participants to dominate discussions and activities, denying others the chance to participate
<p>People are more likely to comprehend and retain new skills and concepts if they can relate them to their prior knowledge, and connect them to things they already know/believe/understand</p>	<ul style="list-style-type: none"> • Use discussion questions and brainstorming sessions to activate participants' prior knowledge, and highlight how the information you are about to cover relates to what they already know 	<ul style="list-style-type: none"> • Present new information without helping participants place it in context

Principle	Best Practice	What NOT to do
<p>Adults learn best when they can relate concepts and skills to their personal experience / job responsibilities</p>	<ul style="list-style-type: none"> • Edit the materials and remove / reduce any sections that are not relevant to your audience’s work, or that your audience would already know • Provide specific examples of how concepts apply to participants’ work • Use discussion and “Quick Survey” questions as an opportunity for participants to relate skills and concepts to their work 	<ul style="list-style-type: none"> • Spend large amounts of time going into the details of concepts that are not particularly relevant to your audience • Spend large amounts of time covering information that your audience would already know • Present new information without providing some real-world context of how participants might use it in their work
<p>People are more likely to retain and use skills and concepts that they learn through self-discovery</p>	<ul style="list-style-type: none"> • Use discussions as a chance for learners to arrive at key concepts through critical thinking and debate • Use activities to help participants practice skills and discover key concepts through trial-and-error 	<ul style="list-style-type: none"> • Intervene in discussions and activities and tell/show participants the “right” response or outcome, without first giving them a chance to arrive at the conclusion, themselves
<p>Participants will retain information better if they are asked to actively recall it during the session</p>	<ul style="list-style-type: none"> • Use the “Quick Review” questions as a chance for participants to actively recall information 	<ul style="list-style-type: none"> • Skip review questions • Allow one or two participants to answer all the review questions
<p>Facilitators should periodically check for understanding, to confirm that participants comprehend and retain information as it is presented</p>	<ul style="list-style-type: none"> • Use discussion and review questions to check for understanding • Direct questions to specific participants throughout the session • If participants do not answer review questions correctly, take a moment to review/revisit any points of confusion then ask again 	<ul style="list-style-type: none"> • Simply ask “Any questions?” at the end of a section and assume that participants understood if they do not ask questions • Treat review questions as a test and blame participants for not comprehending the course content • Allow one or two participants to answer all the review questions

Review Questions

1. What are the seven principles of adult learning?
2. What are some of the ways you can encourage active participation?
3. When demonstrating relevance of the training materials, what are some of the mistakes to avoid?

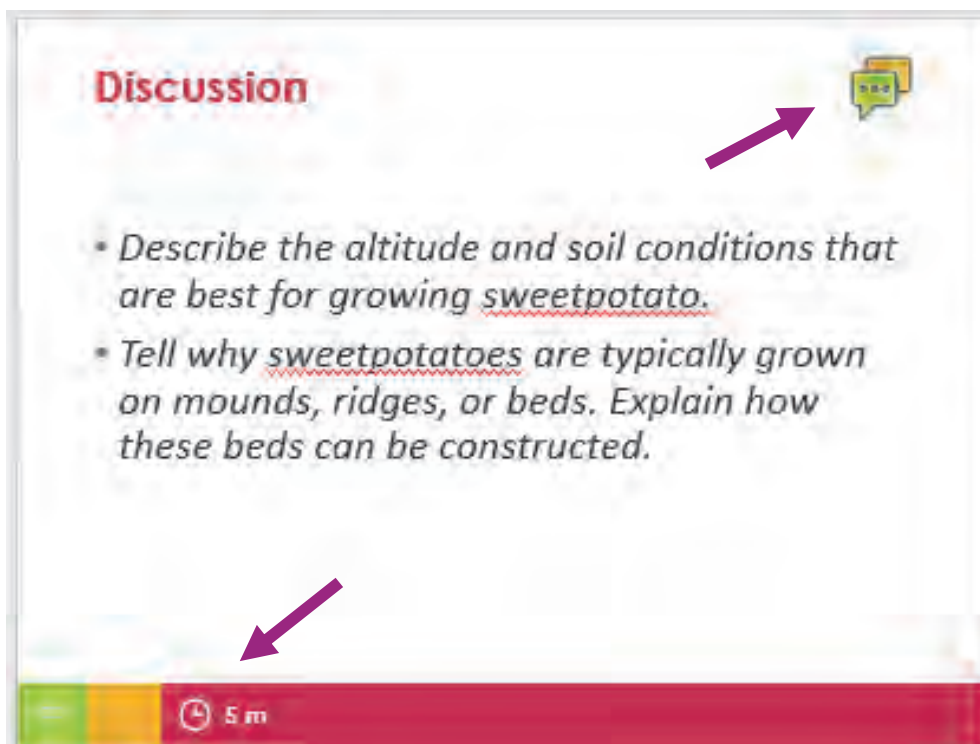
Unit 4 – How to Use the PowerPoint Presentation

The PowerPoint presentation serves several functions:

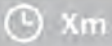






- Offer visual reinforcement for participants
- Serve as an outline for the facilitator
- Indicate when the facilitator should break for discussion and review questions
- Provide general instructions for activities

Icons

Certain slides have symbols in the header or footer that provide the facilitator with additional guidance:



Below, find a list and explanations of the icons:

Icon	Description
	Expected Duration, minutes
	Quick Review/Survey Questions
	Brainstorming Session
	Discussion Session
	Group Activity
	Animated Slide
	End of Animation

“Expected Duration”

The various question, discussion and activity slides may already have an “expected duration” to indicate how long that part of the presentation should reasonably take. Otherwise we suggest that you estimate the duration of each unit and activity as you plan for the training.

You should time yourself during rehearsals to ensure that you are able to complete the presentation in the time planned, with enough time left over for discussions, activities and a 30- to 60-minute buffer at the end.

Time Management Tips

- Explain up front that, while everyone will get a chance to answer questions and participate in discussions, not everyone will get a chance to answer *every* question and participate in *every* discussion and that, for the sake of time, you might need to cut some discussions short.
- If a participant gives a long, unfocused response, ask guiding questions to help them reach a conclusion and/or summarize what the participant has said thus far then continue on or invite another participant to contribute.
- For activities and discussions, notify the group when there is one minute or half a minute remaining, as appropriate.
- If a group discussion goes off topic, make a note of the subject being discussed and say the class can revisit it at the end of the day (people will likely forget in the interim).
- If a discussion goes over time, wait for a pause then intervene, summarize the points raised in the discussion, then move on to the next part of the module.



Quick Review/Survey Questions

Quick Review ?

“Micronutrient malnutrition” refers to a lack of:

- A. Calories
- B. Vitamins and minerals
- C. Protein
- D. Beneficial microbes in the digestive system

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Purpose

The Review/Survey Question slides serve two purposes:

1. As a check for understanding, to confirm that the participants understood the information that was just presented
2. To improve retention through active recall, by forcing participants to remember details of what was just presented

Instructions

- For review questions, correct answers can be found in the PowerPoint presentation notes
- Some sections might end with several slides featuring multiple choice questions or an “alternate” slide with free-response questions. The facilitator should decide which questions to use, based on the size of the audience and personal preference
 - With large audiences (more than 16), multiple choice questions might be faster, and can potentially allow more people to answer.
 - You can either direct the question to an individual or have the entire class answer through a show of hands / mobile response clickers.
 - If using mobile response clickers, you will need to format the question slides as necessary for your specific brand/model of clicker. For example: <https://www.turningtechnologies.com/response-options>
- With smaller audiences (fewer than 16), free response questions can often give you a better sense of how well learners understand the concepts, but you will need to be mindful of time.

Best Practices

If	Do	Do NOT
<p>Participants do not answer the questions correctly.</p>	<ul style="list-style-type: none"> • Go back and review any concepts / key points that the participants did not understand, then ask again. 	<ul style="list-style-type: none"> • Tell the participants they are “wrong” • Answer the question yourself without reviewing the concept first.
<p>One or two participants answer most of the review questions</p>	<ul style="list-style-type: none"> • Direct questions to other participants • Tell the dominating participant(s) that we need to hear from others. • Switch to having the entire class answer, using clickers or a show of hands 	<ul style="list-style-type: none"> • Allow one or two participant(s) to dominate
<p>When answering via a show of hands, participants seem to be going with whatever the majority decides.</p>	<ul style="list-style-type: none"> • Instead of using a show of hands, direct the question to individuals or to pairs of individuals (“<i>Miguel and Isobel – what are the three types of malnutrition?</i>”) • Use mobile response clickers and set the slide to not display answers until everyone has responded. 	<ul style="list-style-type: none"> • Assume most participants understand just because the majority are selecting the correct response via show of hands



Brainstorming Session

Brainstorming

Symptoms of malnutrition

What are the **visible** symptoms of macronutrient (calorie/protein) deficiency?

What are the **visible** symptoms of micronutrient (vitamin/mineral) deficiency?

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Purpose

The Brainstorming Session slides allow participants to **activate prior knowledge**, by relating what they already know to any new information received in the training course. People generally comprehend and retain new information and ideas better when they can connect it to ideas they already know/believe.

Instructions


- A list of possible responses can be found in the PowerPoint presentation notes (note that this list is not necessarily complete – there may be other valid responses)
 - Give the prompt, then encourage the class to think of as many possible responses as they can
 - Write down the group's responses on a flip chart, whiteboard or other surface.
 - For each brainstorming session, you can assign the task of writing down the responses to a different participant, if you feel that might help them feel more engaged.

Best Practices

If	Do	Do NOT
Participants do not volunteer any responses	<ul style="list-style-type: none"> • Ask guiding questions. For example, if asking participants to list vitamins and minerals say, <i>“What do we need for strong bones?”</i> or <i>“What vitamin is in orange juice?”</i> • Direct the question to a specific participant <i>“Caroline, any ideas?”</i> 	<ul style="list-style-type: none"> • Start listing answers, yourself • Skip ahead without listing any answers
One or two participants dominate	<ul style="list-style-type: none"> • Thank them for their input, then invite other participants to reply (<i>“Thank you, James – Prasanth, can you name some vitamins and minerals?”</i>) 	<ul style="list-style-type: none"> • Allow one or two participants to dominate
Responses are incorrect / off-topic	<ul style="list-style-type: none"> • Ask guiding questions • Advance to the next slide, which will typically have a list of valid responses, and say something like <i>“Okay, here are some answers– how many of these did we identify?”</i> 	<ul style="list-style-type: none"> • Tell participants they are “wrong” • Allow the brainstorming session to continue off-topic for a long time



Discussion Section

Discussion 

*If calories, fats and protein are examples of “**macro**nutrients”, what do you think is meant by the term “**micro**nutrients”?*

“

⌚
5 m

Purpose

The Discussion Session slides encourage participants to:

- Learn through self-discovery – Giving participants the chance to arrive at key concepts on their own, versus simply explaining the concepts to them, can improve engagement, comprehension and retention.
- Relate concepts to their personal experience / job responsibilities – If participants see the relevance of the course content to their own life/work, it will increase their engagement and boost long-term retention
- Think critically about the concepts presented in the course, improving comprehension and the likelihood that they will apply the concepts later in their work.
- Take an active role in the learning experience by sharing ideas with other participants and helping each other to learn.

Instructions

- Present the class with the prompt, then allow them to discuss amongst themselves
- Ensure that participants treat each other with respect and that everyone – not just the most assertive participants – is given a chance to be heard
- Gently guide the discussion with prompts and leading questions to ensure that it stays on-topic
- Be mindful of time, and politely bring the discussion to a conclusion if you are nearing the end of the expected duration (unless you are ahead of schedule, in which case the facilitator may – at their discretion – allow the discussion to continue for longer).

Best Practices

If	Do	Do NOT
Learners do not initiate discussion	<ul style="list-style-type: none"> • If the question is general, try relating it to a specific, concrete example. E.g., if the question is about disaster preparedness, ask <i>“What steps could have been taken to mitigate the damage from last year’s floods?”</i> • Invite specific participants to share their personal experience: <i>“Mahmood, have you encountered this issue in your own work?”</i> 	<ul style="list-style-type: none"> • Skip the discussion • Tell participants what conclusions they are expected to reach
One or two participants dominate	<ul style="list-style-type: none"> • Thank them for their input, then invite other participants to reply (<i>“Thank you, James – Prasanth, can you name some vitamins and minerals?”</i>) • Pass around an object to indicate who is allowed to speak, and make sure it is circulated around the entire class 	<ul style="list-style-type: none"> • Allow one or two participants to dominate
Responses are incorrect / off-topic	<ul style="list-style-type: none"> • Ask guiding questions • Politely point out that the current subject of conversation is off-topic, and write a note to revisit it at the end of the day (odds are participants will forget) 	<ul style="list-style-type: none"> • Tell participants they are “wrong” • Allow the brainstorming session to continue off-topic for a long time
Discussion runs over time	<ul style="list-style-type: none"> • Summarize the points raised in the discussion thus far and move on 	<ul style="list-style-type: none"> • Impose <i>too much</i> closure by drawing conclusions participants did not reach, (it is OK to leave some questions open/unresolved)



Group Activities

Activity (Breakout Groups)



Importance of Understanding Lifecycles

- Working in pairs, cut open the open the sweetpotato roots (and vines) which you collected during your field visit or which have been provided by your facilitator.
- Look for different life cycle stages of the insect pests inside the roots.
- Share your findings and lessons learned with the rest.

306

90 m

Purpose

The Group Activities offer participants a chance to:

- Learn through self-discovery – Giving participants the chance to discover key concepts through trial-and-error practice, versus simply explaining the concepts to them, can improve engagement, comprehension and retention.
- Apply concepts from the course to solve real-world problems – If participants see how the course content applies to real-world situations, it will increase their engagement and the likelihood that they will apply the concepts later in their work.
- Think critically about the concepts presented in the course, improving comprehension and the likelihood that they will apply the concepts later in their work.
- Take an active role in the learning experience by sharing ideas with other participants and helping each other to learn.

Instructions

- Review the activity instructions with the class
- Quickly divide the class into groups (usually of 3 to 5)
- Let participants know how much time they have to complete the activity
- Observe the groups, answer questions that arise provide clarification / direction as needed
- Ensure that everyone is actively participating, and no one is dominating the group
- Be mindful of time and remind groups of the time remaining as you near the end of the expected duration.
- Ask questions and give participants time to reflect on the activity afterwards, during debriefing

Best Practices

If	Do	Do NOT
<p>Participants seem to fundamentally misunderstand the activity or not understand the instructions</p>	<ul style="list-style-type: none"> • Re-explain the instructions and answer any questions 	<ul style="list-style-type: none"> • Intervene and start completing the activity for the group, yourself • Explain the desired outcome or divulge too much information, denying learners the chance to learn through self-discovery
<p>One or two learners are doing all the work while other learners seem disinterested / disengaged</p>	<ul style="list-style-type: none"> • Assign specific roles / responsibilities to each team member, to ensure everyone contributes • Ask the disinterested / disengaged learners questions, or ask them to summarize the group's progress, which may prompt them to re-engage • Have smaller groups to increase individual accountability • Change groups for the next activity, to ensure the dynamic does not continue 	<ul style="list-style-type: none"> • Directly confront disinterested learners about their non-participation
<p>Group members argue with one another</p>	<ul style="list-style-type: none"> • Remind participants to be civil • Ask participants to summarize the points of conflict • Look for points of agreement • Encourage group to refocus on problem solving 	<ul style="list-style-type: none"> • Ignore the conflict • Favour one participant over another

Unit 5 – Overview of the 5 Day ‘Everything You Ever Wanted to Know About Sweetpotato’ ToT Course

It is anticipated that that the district level extension and NGO staff who have participated in the 10-day ToT course, will then themselves train field level staff in their organisations using a 5 day ToT course, and these field level staff will then train farmers using a 5 day ToT course. We have therefore developed a suggested outline for a 5-day ToT course which includes lots of opportunities for hands-on learning. The programme for this course is shown below. Facilitators may decide to run it on 5 consecutive days or to cut it into separate training events to fit with the crop cycle. If you have more than 5 days available, we strongly suggest you add in Activity 10.1 Market Visit and spend more time on helping the participants practice their own delivery of the training topics. We hope these materials are supportive and welcome your feedback on them. It should be noted that there is also a formal course evaluation form available on the Sweetpotato Knowledge Portal.

Summarised Programme for the 5 Day ToT ‘Everything You Ever Wanted to Know About Sweetpotato’ Course

Topics	Learning Objectives	Activities
<p>Day 1</p> <p>Facilitators Guide (Topic 1)</p> <p>Overview of Importance of And Uses of Sweetpotato (Topic 2)</p>	<p><i>Participants will:</i></p> <ul style="list-style-type: none"> • Understand the course programme and how it aims to prepare them for training others on sweetpotato • Know about trends and challenges in sweetpotato production and use • Be able to prepare a sweetpotato dish • Understand how OFSP can be substituted for other products in common recipes • Understand how gender issues are relevant throughout the sweetpotato value chain 	<ul style="list-style-type: none"> • <i>Introductions:</i> group activity. [15mins] • <i>Expectations:</i> Sharing and grouping of participants’ expectations (individual stickers) and levelling of these with the trainers’ expectations and then fine tuning the existing learning outcomes as necessary. [30 mins]; • <i>Entry test:</i> Test on sweetpotato knowledge at start of course. (<i>Appendix 1.1</i>) • <i>History and knowledge of sweetpotato:</i> Small group work on participants’ knowledge about sweetpotato history, cultural importance, production and utilisation trends, and the main problems faced by sweetpotato farmers. [20 mins group work, followed by 5min presentation of key issues per group] • <i>Cooking with OFSP:</i> Participants to make a chapati using different recipes which substitute sweetpotato for some of the wheat flour, OR they can make sweetpotato juice OR sweetpotato porridge ((see Activities 9.1, 9.2, and 9.3)) (try to ensure a range of products are made). • <i>Presentation 2.</i> Origin and Importance of sweetpotato (Topic 2), followed by group discussion. <i>Presentation 11.</i> Gender and diversity and how it is relevant for sweetpotato activities 11.1 followed by group

		discussion.
<p>Day 2</p> <p>Nutrition and OFSP (Topic 4)</p>	<ul style="list-style-type: none"> • Understand what a balanced diet is and why it is important • Know how OFSP can contribute to reducing Vitamin A deficiency • Be able to select appropriate local ingredients to prepare a child- friendly and nutritious OFSP meal • Understand the importance of the gender aspects of household nutrition 	<ul style="list-style-type: none"> • <i>Brainstorm:</i> What is a balanced diet? • <i>Presentation 4.</i> Nutrition and Orange-fleshed Sweetpotato • <i>See all Activities 4.1 through 4.5</i> • <i>Group discussion:</i> Strengths and weaknesses of approaches. Are we integrating gender well?
<p>Day 3</p> <p>Different varieties of sweetpotato and their characteristics (Topic 3)</p> <p>Selecting, preserving and multiplying SP planting materials (Topic 5)</p>	<ul style="list-style-type: none"> • Be able to identify, select and conserve clean sweetpotato planting materials • Know about the principles of positive and negative selection and preservation of sweetpotato planting materials • Understand key differences between sweetpotato varieties • Know about the key characteristics of at least 3 sweetpotato varieties suitable for their area/ region • Be able to help farmers identify the key characteristics they are looking for in a sweetpotato variety • Understand that varietal preference differs between people • Be introduced to why care during harvesting is important for sweetpotato • Be experienced in conducting a taste test (using red, yellow, and green cards) 	<ul style="list-style-type: none"> • <i>Activity 5.1: Vines for planting: clean and multiplied.</i> Field activity to identify clean planting materials, take vine cuttings, learn how to plant them in a rapid multiplication bed, discuss how to care for them, calculate vine multiplication rates. • <i>Activity 3.2: Spot the difference.</i> Field activity. • <i>Activity 3.3: Selecting sweetpotato varieties.</i> • <i>Presentation 3.</i> The natural diversity of sweetpotato; defining characteristics of different sweetpotato varieties. • <i>Presentation 5 Part 1.</i> Sweetpotato Seed Systems, Unit 1 through 7. • <i>Activity 5.2: The Triple S system.</i> Practicing the triple S method, from the root selection stage, to loading and placement in cool dry area.
<p>Day 4</p> <p>Sweetpotato production and crop management (Topic 6)</p>	<ul style="list-style-type: none"> • Understand the different stages of the sweetpotato crop cycle and the management implications of each stage • Be able to find field examples of the key pests 	<ul style="list-style-type: none"> • <i>Activity 7.1: Field hunting for sweetpotato pests and diseases and learning how to manage them.</i> (as possible). Include practice and discussion of hilling up and rouging of SPVD affected plants. • <i>Activity 6.1: Comparing sweetpotato</i>

<p>Sweetpotato pests and diseases and their management (Topic 7)</p>	<p>and diseases of sweetpotato and explain and show the damage each can cause</p> <ul style="list-style-type: none"> • Know a range of practical techniques for managing these key pests and diseases • Be able to help farmers set up a field experiment to compare different sweetpotato varieties or different sweetpotato management practices 	<p><i>varieties and management practices.</i></p> <ul style="list-style-type: none"> • <i>Presentation 6.</i> The sweetpotato crop cycle. • <i>Presentation 7.</i> Lifecycles and management of sweetpotato pests and diseases.
<p>Day 5 Harvesting, storing, processing and marketing OFSP (Topics 8, 9, 10)</p> <p>Planning to train others on 'Everything You Ever Wanted to Know About Sweetpotato'</p>	<ul style="list-style-type: none"> • Know about the main aspects of sweetpotato harvesting, processing and post-harvest management. • Understand how the processing and storage of OFSP affects its beta-carotene content • Be familiar with the concepts of marketing and market orientation • Understand the opportunities and challenges in sweetpotato fresh root and processed product marketing • Have begun to think about and practice delivering the 5-day training course on 'Everything you Ever Wanted to Know About Sweetpotato' 	<ul style="list-style-type: none"> • <i>Presentation 8.</i> Piecemeal harvesting, chip drying & curing for improved shelf-life; post-harvest management of fresh roots and dried chips; storage containers, protection from pests and monitoring over time. • <i>Activities 8.1 and 8.2.</i> • <i>Group discussion:</i> on who to target for processing training, such as people who are already micro-food processors and might incorporate OFSP, discussion regards the importance of involving men even though women do the food preparation usually, but men are still influential in deciding what foods to plant or purchase. • <i>Presentation 10.</i> Marketing concepts, trader training & gender considerations. • <i>Activities in Unit 8 below, 'Learning-By-Doing'</i> • Presentation of certificates.


Unit 6 – Memory Aid Cards

Additionally, a set of ‘memory aid cards’ have been prepared as support materials to accompany the ‘*Everything you Ever Wanted to Know About Sweetpotato*’ manual and training course.

They are a set of cards which sequentially cover different sweetpotato topics. Each card has a photo or diagram and key points related to the topic. It is hoped that trainers will use this set of cards as a useful notebook/ instant presentation tool at points during their training activities. The picture can be shown to the farmers/ trainees while the trainer uses the notes to make sure they cover the key issues in their training. However, it should be noted that this set of cards have been prepared as memory aids and they should never replace practical learning- by-doing activities and discussions with farmers.

Example of a Memory Aid Card

Pest control during vine production



- Vine multiplication sites should be carefully monitored for pests
- If pest outbreaks become severe (e.g. caterpillars or millipedes) see the extension officer for appropriate pest management recommendations
- Fence plots to keep livestock from eating planting materials

Unit 7 - Gender and Diversity Aspects of Helping Adults to Learn

A thorough discussion of gender and diversity aspects in relation to sweetpotato is presented in Topic 11. Key gender and diversity issues relevant to helping adults to learn include:



- Training is not something that happens in a vacuum, it builds on the prior knowledge and experiences which women and men bring with them when they take part in training programmes. When designing a training course and selecting the facilitators it is important to ensure that this is done in ways which will help women and men from the focal range of cultural and educational backgrounds learn best.
- There are five key areas where gender and diversity aspects need to be included in the planning, implementation and monitoring of training courses, these overlapping areas are: the content; the training approaches and activities; the language and communication; the framework conditions/ logistics; and the gender awareness competence of the facilitators.
- During the pre-training needs assessment, it is important to understand what experiences or prior knowledge potential participants have and whether this differs between women and men. In the case of a sweetpotato training course it would be useful to understand: the typical activities and responsibilities of both men and women across the day and the year; who controls and has access to which resources, and how decisions affecting sweetpotato activities (e.g. land, planting time, source of planting materials, varieties, crop management, labour availability, nutrition and food preparation, processing, marketing, and income) are made.
- The course organisers may wish to set gender and diversity targets, such as: an equal number of men and women attend the course and are proportionally representative of the wealth or ethnic groups in the area; speeches by made by different groups of participants are approximately the same number and length (e.g. one group is not dominating the discussions); course advertising and materials used for the course are produced in gender-neutral language; the issue of gender and diversity is taken up as a central theme in the course; the opinions/ attitudes of women and men to a defined (gender) issues have demonstrably changed during the course.
- It is important that training materials do not lump people together as though there was no diversity among them or suggest stereotypes and roles which then make the participants feel limited. Training materials including documents, pictures, and examples should be checked to ensure they adequately present the social realities of both genders and work towards changes. If existing course materials do present farmers as a homogenous group or women and men only in stereotypical roles, then it is important for the facilitator to point this out and discuss these issues in the training course.
- An interested facilitator will be able to recognise when they are using training approaches which are biased towards certain groups and can then work to help widen participation and involvement of all the trainees present. For example, men may find it difficult to talk about personal matters with other men or may be sceptical about some creative methods, such as painting or role play. Women may be shy when taking part in open debates or avoid taking on leadership duties or presentations. These are learned behaviours, and they are changing rapidly in most societies. By using a range of different training and learning approaches to achieve the training course's goals and the session's learning outcomes, the facilitator will help ensure that all participants participate and also are able to try something new or unusual.
- In training programmes which bring participants from a range of locations or bring in external facilitators, there are usually a range of mother tongue languages present. It is

essential that oral translation services are organised to ensure that all participants can understand what is being said and can participate and contribute to discussions. Facilitators need to make sure they are using gender neutral language, e.g. business person and not business man; chairperson and not chairman etc.

- Establishing rules or norms at the beginning of the training programme can help support:
 - The use of gender-neutral language;
 - Avoidance of stereotyping;
 - Restrictions on the length of speeches by each person;
 - People to speak without being interrupted by others;
 - The awareness and avoidance of sexist language, disparaging or personal remarks;
 - Discussion time;
 - Feedback opportunities.
- During the planning of the training course it is important to think carefully about *who* the participants should be in order to ensure that the benefits from the training are maximised and will continue to bring further benefits within the community. Remember that not all farmers are middle aged, middle income, well-educated men! Ensure that the way you design your training programme enables female farmers, young farmers and poor farmers to all benefit from it.
- Potential participants can be accidentally excluded from participating in training programmes if care is not taken to ensure the acceptability to all participants of the:
 - The place and timing of training courses;
 - Security arrangements (routes, access, public transport, overnight facilities);
 - Goals of the training course are understood by not only the target participants themselves but leaders and others who influence their behaviour or have influence over their activities;
 - Information channels used for advertising and promoting the course;
 - Compatibility with other livelihood activities e.g. Family duties, farming activities
 - Facilities (food, washrooms, transport arrangements, childcare, lighting, background noise);
 - Cost.
- When selecting facilitators in addition to their knowledge of the subject it is also important to select facilitators with strong skills in the use of a range of participatory techniques. Such a facilitator will usually manage to create a beneficial learning environment with meets the requirements of the different participants. It is helpful if facilitators have both practical and theoretical gender skills, and actively look out for any gender issues arising. Gender and participatory techniques training should be included in any pre-training courses being organised for facilitators. If several facilitators are involved in the course, it is helpful to include both men and women facilitators.
- In order to learn how to better meet the needs of different groups/types of participants, course evaluations need to ensure that the evaluation data can be easily disaggregated by sex, wealth, or ethnic group.

Review Questions

1. How could you as a facilitator ensure respect for diversity during the training?
2. What are some ways you can ensure diversity when selecting participants to take the course?

Answers to Review Questions

Unit 2

1. Who are the different types of trainers?
 - *Primary trainers (the host training institute identified); secondary trainers (the district level agricultural and nutrition extension and NGO staff); tertiary trainers (the field level extension and NGO staff); end users, some of whom will become farmer trainers.*
2. What are some of the criteria to use when selecting participants?
 - *Be active and practising extension or NGO staff; Be willing to participate and work in groups; Get on well with farmers and other extension or NGO staff and be willing and able to share their training experiences; Be selected from a range of social groups, e.g. Gender, age, public/private organisations; Be located in a range of different locations across the existing or potential sweetpotato growing areas of the country so that there is a good spatial spread of trainees from whom others can learn.*

Unit 3

1. What are the seven principles of adult learning?
 - *Using visual aids; Active participation; Activating prior knowledge; Demonstrating relevance; Encouraging self-discovery; Active recall, Checks for understanding*
2. What are some of the ways you can encourage active participation?
 - *Engage learners in a dialogue through discussion questions; Direct questions to specific participants throughout the session.*
3. When demonstrating relevance of the training materials, what are some of the mistakes to avoid?
 - *Spend large amounts of time going into the details of concepts that are not particularly relevant to your audience; Spend large amounts of time covering information that your audience would already know; Present new information without providing some real-world context of how participants might use it in their work.*

Unit 7

1. How could you as a facilitator ensure respect for diversity during the training?
 - *Use gender-neutral language; Avoid stereotyping; Be mindful of restrictions on the length of speeches by each person; Allow people to speak without being interrupted by others; Be aware and avoid sexist language, disparaging or personal remarks; Give equal feedback opportunities.*
2. What are some ways you can ensure diversity when selecting participants to take the course?
 - *Offer the course to different groups equally; Run separate training courses for different groups; Have the courses at different times that work around other duties (household, work); Make the course attractive to different groups; Promote the opportunities for both men and women.*

References

The content of this topic draws heavily on materials which the author, Tanya Stathers developed recently for a similar section in a postharvest handling and storage management training manual for WFPs Purchase for Progress Programme (Hodges and Stathers, 2012). It also draws on the experiences of many other practitioners and the references below.

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Appendix 1

Throughout the ‘Everything You Ever Wanted to Know About Sweetpotato’ course, there are Activities placed at the end of each Topic. These activities have been designed to provide hands-on discovery learning opportunities for the participants. We hope that by learning about sweetpotato in a hands-on way, not only will participants leave the course with useful knowledge, but they will also be able to share their knowledge with others using a practical learning-by-doing approach. The following example activities could occur at the end of the course; However, we hope these activities will also be used by trainers as stand-alone learning activities and as part of other training courses. Refer to the Appendix Activities located at the end of this manual for all topics’ activities.

The table below is an overview of an example Topic, ‘Planning to train others.’ After reading and completing course materials, we suggest the learning by doing activities listed below.

Topic	Learning Objectives	Activities
Planning to train others on ‘Everything you Ever Wanted to Know About Sweetpotato’	<p><i>Participants will:</i></p> <ul style="list-style-type: none"> • Understand and have developed the draft learning outcomes and approaches, training materials and draft logistics plans (timing, venue and field sites, participants) of the sweetpotato training courses they will be delivering • Be able to deliver a 5-day training course on ‘Everything you Ever Wanted to Know About Sweetpotato’ 	<ul style="list-style-type: none"> - <i>Practising being learning-by-doing facilitators.</i> Practice in facilitating a key sweetpotato topic, and group work on the principles of giving and receiving constructive feedback (see <i>Activity</i> below). - <i>Training Action Plan:</i> Practice applying the new knowledge and skills learned. Participants will draft logistics planning for their delivery of training others (see Appendix 1.2) [1hr] - <i>Activity: Ideas for additional sweetpotato learning-by-doing activities.</i> [1hr 20 mins] - <i>Activity: Evaluating a training course.</i> Course evaluation (<i>option to repeat sweetpotato knowledge test as exit test</i>) [1hr] - Presentation of certificates for completing course [1hr]

Appendix 1.1 Practising Being Learning-by-Doing Facilitators

Objectives

Participants will:

- Be able to confidently facilitate discovery-based learning on the key topics on the 5th day of the *'Everything you Ever Wanted to Know About Sweetpotato'* course which they will be facilitating
- Understand the preparation required to facilitate a meaningful learning-by-doing activity
- Receive constructive feedback from their peers on the strengths and weaknesses of their facilitation skills

Time

2 hours 30 minutes

Materials

Cards with the key topics from the 5-day training course written on them (e.g. conserving and multiplying planting materials including advanced planning, selecting clean planting materials, managing sweetpotato weevils, managing viruses in sweetpotato, processing sweetpotato, marketing sweetpotato, vitamin A and nutrition etc.), participants will need their *'Everything you Ever Wanted to Know About Sweetpotato'* training manual, note books and pens; stickers/ post-its, flip charts, masking tape, marker pens, all the equipment that has been used during the training programme including approx. 100 sweetpotato roots, some of which should be orange-fleshed.

Suggested Steps

1. Ask the participants to work in groups of four people. Assign half the groups to act out a short scene showing a bad facilitator, and the other half of the groups to act out short scene showing a good facilitator – they can choose any topic they like. Give them 5 minutes to practice and then 1 minute each to present. Then facilitate a 10-minute group discussion on the characteristics of good and bad facilitators, and the strengths of using an experiential/ discovery-based learning approach (*Sections 1.1. and 1.2 of this manual will be useful resources for this*). [20 mins]
2. Ask the participants to work in groups of four people. Explain that they are going to be given an opportunity to practice facilitating some of the key sweetpotato topics they will soon be training others on. Explain that each group will be given a card with one of the key sweetpotato training topics on it. They will need to use their memory, experience and the manual to develop and practice the facilitation of a relevant learning-by-doing activity related to the topic. They will be given half an hour to prepare, and then they should be ready to share a 5-minute role play of them facilitating that activity with the rest of the group. (Note: it is vital that at least two of the participants per group act as the facilitator during their role play, so they need to organise to share that role). [5 mins]
3. The facilitator should hand out the cards and be available to help the participants if they have any questions. The participants will in their groups spend 30 minutes preparing and practicing the role play of them facilitating a learning-by-doing activity on the key topic they have been given. Remind them of the importance of at least two of them both playing the role of the facilitator during the role play. [30 mins]
4. Ask the participants to move their chairs into a semi-circle facing the 'stage' area. Explain that you are going to give out stickers, and after they have watched each group's role-play they are to quickly gather in their small group of 4 and write down 2 strengths and 2 weaknesses about the facilitation skills or activity on the stickers. These stickers will then be stuck on the flip chart for that group, before they watch the next group's role play. Remind

them of the learning opportunities that arise from constructive criticism. Remind them also about the importance of working quickly, and that they should only put one comment per sticker, and write it clearly using marker pens. [5 mins]

5. Role plays (each group has 5 minutes), then a couple of minutes in-between for the audience to discuss and write on stickers 2 strengths and 2 weaknesses of the facilitation skills and activity. Note their needs to be a separate flip chart sheet for each small group the facilitator should prepare and paste them all up while the small groups are practicing their role-plays. [1 hour]
6. Give the participants 5 minutes to review all the strengths and weaknesses comments.
7. Ask each group to take the flip chart with the comments about their facilitation on it, and to review and group them, and discuss how they can build on the strengths and improve on the weaknesses. [10 mins]
8. Ask one group to share with the whole group their suggestions for how they could improve their facilitation and learning-by-doing exercise the next time. Facilitate further group discussion on this if necessary. [10 mins]
9. Ask the participants, how they took gender into consideration during their activity. [10 mins]

Appendix 1.2 Ideas for Additional Sweetpotato Learning-By-Doing Opportunities

Learning Objectives

Participants will:

- Experience the steps involved in creating learning-by-doing activities
- Have created their own learning-by-doing activity for a key sweetpotato topic relevant to their location

Time

1 hour 20 minutes

Materials

Participants will need their 'Everything you Ever Wanted to Know About Sweetpotato' training manual, note books and pens; stickers/ post-its, flip charts, masking tape, marker pens, all the equipment that has been used during the training programme including ~100 sweetpotato roots, some of which should be orange-fleshed.

Suggested Steps

1. Ask the participants to get themselves into new groups of 8 people (*e.g. not the same groups they had for Activity 1.3.1.*). Explain that you want them to spend 30 minutes identifying and creating a new learning-by-doing sweetpotato activity which they feel would be useful when they train others. They will then have 5 minutes to describe or present the activity to the rest of the participants. [35 mins]
2. Ask each group in turn to share or show the learning-by-doing activity that they have planned to the rest of the participants. [*Note: the facilitator should take note of all ideas as they could be used to strengthen future training courses and editions of this training manual*]. [30 mins]
3. Facilitate a short discussion about these suggested activities [15 mins]

Appendix 1.3 Evaluating A Training Course

Learning Objectives

Participants will:

- Have experience in evaluating a training course
- Know how to analyse participants feedback in order to improve their facilitation and training delivery

Time

1 hour 15 minutes

Materials



Enough photocopies of the course evaluation form 12.5.5c for each participant, pens

Suggested steps

1. Ask the participants to individually complete the course evaluation form, based on their experience of the ToT programme. [15 mins]
2. Then ask them to get into groups of 8 people. In their group they need to analyse the groups evaluation of the course, and to prepare a short summary of their responses to 5 of the questions on the form (they can select whichever five they like, but they must include some that had quantitative and some that had qualitative responses). [30 mins]
3. Ask each group to share their summaries with the rest of the participants [15 mins]

Facilitate a discussion regards the value of evaluating a course, and how they might evaluate what actual learning outcomes took place amongst those they train in the short, medium and long-term. [15 mins]

Appendix 1.4 Basic Written Test to Assess Current State of Sweetpotato Knowledge

Full Name:	
Male or Female:	
Training course location:	
Date:	
1. What colour can the flesh of sweetpotato roots be?	
2. What is a balanced diet?	
3. Which part of the vine should you use as planting material?	
4. What are the signs of virus infection in sweetpotato plants?	
5. What should you do if your sweetpotato plant shows signs of being infected with a virus?	
6. Have you seen this insect before, what is its name and what does it do to sweetpotato?	
7. Are there any insects commonly found in the sweetpotato field which are beneficial to farmers. If yes, which ones?	
8. What causes this to happen to sweetpotato roots?	
9. What problems can someone who is deficient in vitamin A have?	
10. What are the main problems related to transport of sweetpotato?	
11. What are the 5 pillars of marketing?	
12. Name four key actors/ stakeholder types in the sweetpotato market value chain?	
13. What other recipes can you make from sweetpotato?	

14. What part of the sweetpotato plant can be fed to livestock?	
15. Why is it important to involve both men and women in sweetpotato training?	



Appendix Activities

Activity 2.1 Stakeholder Presentations

Objectives

The purpose of this activity is to take the facts and be able to present them to stakeholders in a positive and informative way.

Time

1 hour

Materials

- Flip chart
- Pens

Suggested Steps

1. Divide everyone into groups
2. Have each group create a short presentation for different stakeholder groups on the benefits of OFSP as a solution to vitamin A insufficiency
3. The different stakeholder groups could include an international donor, a local NGO focusing on maternal and child nutrition, and the government ministry of agriculture

Activity 3.1 Sweetpotato Taste Test

Objectives

To better recognize the different varieties of sweetpotato and how they taste.

Time

1 hour

Materials

- Different varieties of sweetpotato
- Cooking utensils
- Additional ingredients depending on the recipe chosen

Advanced Preparations

- Collect different varieties of sweetpotato
- Cook the sweetpotato in advance if necessary

Suggested Steps

1. The instructor should bring in uncooked varieties of sweetpotato to view and compare.
2. Pick a recipe that is best for each variety and cook while at the learning centre.
3. If it is not possible to cook together, prepare outside of class and bring in to share.

Activity 3.2 Spot the Difference

Objectives

- Become familiar with attributes of importance to sweetpotato farmers, and with farmers' perceptions of the attributes of their varieties
- Be able to identify sweetpotato varieties using standard descriptors
- Be able to conduct gender-sensitive consumer taste tests

Time

2 hours and 45 mins / half day

Advanced Preparations

Identify a nearby field with several varieties of sweetpotato growing in it, and meet the farmer and see if they are agreeable to their field being visited by the participants, themselves being interviewed by the participants, and some (try and minimize the number) of the plants being dug up to see the root characteristics and to remove some roots for tasting, possibly 1-2 plants per variety. The farmer will need to be compensated for the roots that are used.

Materials

- Nearby field with several varieties of sweetpotato growing in it and which the participants can harvest some roots (note: this activity could also be done in an on-station field but this would then omit the opportunity for participants to learn why farmers grow those varieties)
- Flip chart
- Marker pens
- A4 plain white paper
- Pencils
- Erasers
- Participants notebooks
- Sufficient copies of the handout on sweetpotato descriptors (Appendix 3.1) and on estimating the beta-carotene content through flesh colour of orange fleshed sweetpotato varieties (Appendix 3.2)
- Sufficient copies of the form for participatory storage root taste evaluation (forms 5b and 5b2 Appendix 3.5b)
- Cooking stoves and fuel
- Pans
- Water
- Matches
- Knives

(Note: Taste test could be done in the training room)

Suggested Steps

1. Walk to a nearby field with several varieties of sweetpotato growing in it. Greet the farmer and remind her/him that as per the arrangement the course participants will move around the field and try and identify and then sketch different sweetpotato varieties that are growing there. They would then like to ask her/him about her/his sweetpotato variety choices. In groups of 5 people the participants should move around the field and locate at least 3 different varieties of sweetpotato. Each participant should sketch the leaf and root shapes of the different varieties and note down any colour differences between them. Using the sweetpotato descriptors handout they should then identify the shape of the sweetpotato roots and leaves that they have drawn.

2. The participants should then ask the farmer about why she/he grows a range of sweetpotato varieties, what the different survival rates, growth durations, growth habits, climatic preferences, root and leaf tastes and marketable traits of the different varieties are. This is best done in small groups if possible. Participants should make a note of the farmer's answers and how they relate to the varieties they have drawn. Encourage the participants to use open-ended probing questions to learn more about the different varieties.
3. In their small groups the participants should discuss and describe the different varieties of sweetpotato in the field.
4. The participants should harvest some roots of each variety to taste together with the farmer/s, and then record the different taste aspects of each variety using the method described in Topic 3.3 of the manual (with the red, yellow and green cards) and use the Forms (5B and 5B2) in Appendix 3.5b and their notebooks to record their findings. *If possible, try and ensure one of the varieties being tested has low dry matter content.*

If Possible

Some roots should be harvested without care (so they become damaged) and some with care. Do not boil all of these roots -- keep several of each variety of them on a table in the training room, to use for the harvesting discussion on day 9 of the ToT. If REALLY organized in advance, you could have some roots that were field cured prior to harvest, and you could also carry these back to the training room so that the effect of curing could be assessed by the participants when they come to study harvesting on Day 9.

Activity 3.3 Selecting Sweetpotato Varieties

Objectives

- Know and describe key characteristics of at least 3 sweetpotato varieties suitable for their area/ region
- Be able to converse intelligently (listen) with farmers about key characteristics they look for in a sweetpotato variety
- Be able to develop OFSP promotional materials referring to key characteristics of importance to farmers and consumers.

Time

70 mins

Materials

- Flip charts (at least 1 page per participant);
- Coloured pencils including plenty of green, brown, orange and yellow ones
- CIP OFSP catalogue.

Suggested Steps

1. Facilitate a group discussion on the key factors differentiating sweetpotato varieties and which are important for which reasons; make notes of key points on a flip chart [10 mins]
2. Then for the main two sweetpotato varieties grown in the participants work locations, ask them each to use half the flip chart page to create an advertising poster showing and describing the different characteristics of each of these varieties. The facilitator should push them to think of different characteristics they could include:
 - a) Leaf shape and colour
 - b) Time to root maturity
 - c) Root size, colour (skin and flesh) and shape
 - d) Resistance to diseases
 - e) Root yield
 - f) Dry matter content
 - g) Taste
 - h) Texture
 - i) Marketing appeal [30 mins]
3. Then ask them to each add into their posters (on the empty half of the page) two new varieties they have learnt about during the ToT, which they feel could be promoted in their work locations (and why, include gender aspects). (Note: These flipchart style posters could act as training materials when this trainer then trains other people). The flipcharts should then be posted up around the training room as a small exhibition and to enable the facilitator to see which characteristics and new varieties have been picked up on by the participants. [20 mins to complete their posters, then 10 mins for the exhibition]

Activity 4.1 How Well-Balanced Are Our Diets?

Objectives

Gain an understanding of how local diets can be made more nutritious

Time

40 mins

Materials

- Flip chart
- Pens
- Masking tape

Suggested Steps

1. With the trainees working in groups of 5 or 6, ask them to identify at least two meals that are commonly eaten by the community in their area. Note: they may wish to think about a meal that is eaten by a poor household and another by a medium wealth group household, or by a rural household and an urban household.
2. Ask the group to analyse the adequacy of these meals in terms of the food categories that are needed by the body (e.g. energy giving- cereals, roots, tubers, plantains; body building – pulses, seeds, nuts, milk, eggs, fish, meat; energy storage – fats and oils; body protective – fruits and vegetables). After each small group has presented their analysed meals, open up a general discussion to enable the participants to highlight gaps, questions or differences of opinions regarding the meals and their food/nutrient type categories. Ensure the discussion covers: adequacy in terms of quality, quantity, and value; seasonality and common food substitution practices; gendered aspects of food consumption and sharing; and food hygiene.
3. In their small groups, ask the participants to discuss the challenges of preparing balanced diets in the community, and any solutions they know of.
4. Then go around the room asking each group to share one key challenge to preparing a balanced diet and suggested solutions for overcoming it. List these on a flip **chart and** open the topic up for a few minutes of general discussion to see if any extra suggestions can be added.

Activity 4.2 Dining from A Vitamin A-Rich Menu

Objectives

Understand how to prepare balanced meals with locally available vitamin A-rich foods

Time

20 mins

Materials

- A4 sheets of paper and pens
- Actual examples of vitamin A-rich local foods such as pumpkins, pawpaw, OFSP, local and exotic green leafy vegetables etc., if available

Suggested Steps

- 1) Divide the trainees into 4 groups and let each group come up with two meal plans that contain locally available vitamin A-rich foods (including orange-fleshed sweetpotato). Ask each group to write their meal plans on A4 sheets of paper, and then stick these on the wall.
- 2) Give participants a few minutes to look through the other groups' vitamin A rich meal plans and open up a short general discussion addressing any issues the participants want to discuss or raise. Probe for ways in which the meals could be improved. Emphasise the importance of having oil in the dishes as the fats help in absorption of vitamin A and therefore make it more accessible to the body.
- 3) Arrange for the vitamin A meal plans to be typed up onto a page that will then be photocopied for the participants to take away with them.

Activity 4.3 Virtual Porridge Making

Objectives

Be able to prepare a nutritious porridge suitable for children from OFSP.

Time

1 hour (Note: the actual porridge making activity planned on Day 1 will also link to this)

Materials

- 4 sets of the virtual porridge cards with photos and descriptions of different ingredients that could be used to make a nutritious child's porridge (see Handout below)
- Masking tape
- Flip chart
- Paper and pens

Note: The porridge can only have a maximum of 4 ingredients.

Suggested Steps

- 1) Divide the trainees into 4 groups, give each group a set of the 25 ingredient cards, ask them to use the cards to develop nutritious and acceptable porridge recipes that a typical household could use to feed children from 6 to 24 months old. Discuss how these recipes will change as the child grows and new foods are incorporated into their diet. Explain that it is very important for the porridge to be dense; it should NOT drip off the spoon. Children have small stomachs, so they need to come up with a recipe that does not weigh more than 150 grams yet are nutritious. Explain that they will need to present their recipe to the whole group at the end, note that a recipe includes the steps as well as the ingredients.
- 2) Invite each of the 4 small groups to present their porridge recipes to the whole group.
- 3) Ask the participants to discuss the differences in the choices of ingredients between the recipes presented, the pros and cons of the different ingredients used, the practicalities of obtaining the ingredients and the importance of food diversity and varying the recipes. They should make notes about their selected recipes and the reasons behind choosing them.



Activity 4.4 Develop a Gender Responsive Nutrition Behaviour Change Strategy

Objectives

Gain experience in identifying behavioural issues associated with poverty and gender, and in developing a gender-sensitive behaviour change program

Time

1 hour

Materials

- This topic of the manual
- The short story below
- Flip chart
- Marker pens

Suggested Steps

1. Ask the trainees to read through the short story on the following page.
2. Divide the trainees into 4 groups. Ask them to discuss how poverty and gender issues affected the nutrition and health status of Chio, Tuy, the oldest girl, the other children and the baby in the womb. They should record their answers on two flip charts, one for “Poverty” and the other “Gender”, and then ask the groups to share their answers/discussions in plenary.
3. In their same groups, ask them to design a nutrition communication behaviour change program on how they could reach Chio, Tuy and Tuy’s parents with information and knowledge they need to change their nutritional behaviour. They should sketch their behaviour change program and then present it back to the plenary group.

SHORT STORY: Poverty, Gender and Development of Nutrition Behaviour Change Strategies

Chio had five children ranging from an infant boy, Tuy, who was 10 months old, to a 12-year-old girl who had already started menstruating. The family was poor. Some days, Chio didn't know how she was going to feed everyone.

She herself had never gone to school. Her husband was a truck driver in the nearby town. She lived in the village with her children whilst her husband would come to the village every month. She had decided to return to the village because her husband lived in two small rooms on the outskirts of the city and there was not enough room for everyone to fit. In addition, it was difficult for her when she had her infant son because there were no sanitation facilities and she had to fetch water every day from the common well. In addition, in the rural area Chio's husband had inherited a piece of land from his parents, so Chio and her family could stay there and cultivate their own food. This was better than living in the city where they had to buy everything and never had enough money. She had recently received training on how to make a home garden and plant orange fleshed sweetpotato (OFSP); however, her husband was not convinced that OFSP would be helpful to the family at all.

Chio felt very tired and went to the clinic. She took her infant boy, Tuy, as she was still breastfeeding. The doctor told her she was pregnant. Tuy, who was born small, had started eating complementary food (besides the breast milk); however, he was not eating much, and she did not have the time to feed him. She decided to stop breastfeeding to keep her energy for the new baby. Chio was unhappy about being pregnant; they couldn't afford it and there was too much work to do already. She had to tend to the field and feed the cattle. She also had to feed the two pigs that her husband had purchased. She had to walk long distances to look for the pig feed.

Recently her husband had lost his job, so he had come back home, and there was not enough money. They were not able to produce enough on their small piece of land because of the depleted soil fertility, and anyway the land was too small to cater for the needs of their growing family. When her husband was home he helped with looking for the pig feed; however, usually during the day he was out looking for a job and only came back home at night. When she made the evening meal, she gave her husband food first (because he was tired from looking for a job the whole day and also that is what she had learnt from her mother: 'men eat first because they do all the hard work'), and then divided the rest among the children, leaving a little for herself; she was too tired to eat anyway. Their food on most nights consists of rice, a sauce made from tomatoes, some cassava and vegetables from Chio's home garden.

Source: Adapted from a story in WHO, 2010

Activity 4.5 Raising Awareness and Creating Demand for Orange-Fleshed Sweetpotato

Objectives

Gain experience in using a range of tools to raise community awareness about OFSP

Time

55 mins

Materials

This topic of the manual



Suggested Steps

- 1) Divide the trainees into 4 groups. Explain that due to the 'hidden' nature of micronutrient malnutrition, it is often necessary to create demand for OFSP. Explain that they are going to practice using different.
- 2) OFSP community awareness raising techniques. Give them 15 minutes to discuss and practice before sharing with the rest of the participants in a 5-minute presentation.
 - a) One group will develop a short play using a theatre script
 - b) One group will create a short song
 - c) One group will act out a potential radio or television advertisement
 - d) One group will give a short speech
- 3) Give each group 5 minutes to present their community awareness activity or strategy.
- 4) Ask the participants to discuss the practicalities and pros and cons of using the different techniques and any ideas they have for other OFSP awareness raising methods. They should make notes on the awareness creation techniques presented, their pros and cons and any other good ideas.

Handout: Virtual Porridge Making Ingredient Cards (photocopy and cut into separate cards)

AVOCADO, fresh and ripe

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	16	0.2	0.67	0.055	0.064	0.7	1	5.8
30 grams	48	0.6	2.01	0.165	0.192	2.1	3	17.4
100 grams	160	2	6.7	0.55	0.64	7	10	58



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene.
DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

PUMPKIN, cooked

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	3	0.148	0.29	0.028	0.01	20	0.65	1
30 grams	9	0.444	0.87	0.084	0.03	60	1.95	3
100 grams	30	1.48	2.9	0.28	0.1	200	6.5	10



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene.
DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

SUGAR, granulated

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	38.7	0	0	0.001	0	0	0	0
30 grams	116.1	0	0	0.003	0	0	0	0
100 grams	387	0	0	0.01	0	0	0	0



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene.
DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

GROUNDNUTS, boiled and mashed

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	31.8	1.35	0.88	0.101	0.183	0	0	7.5
30 grams	95.4	4.05	2.64	0.303	0.549	0	0	22.5
100 grams	318	13.5	8.8	1.01	1.83	0	0	75



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene.
DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

RICE, cooked

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	13	0.238	0.03	0.149	0.042	0	0	9.7
30 grams	39	0.714	0.09	0.447	0.126	0	0	29.1
100 grams	130	2.38	0.3	1.49	0.42	0	0	97



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene.
DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

COCONUT MILK, expressed from grated coconut meat and water

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	23	0.229	0.22	0.164	0.067	0	0.28	1.6
30 grams	69	0.687	0.66	0.492	0.201	0	0.84	4.8
100 grams	230	2.29	2.2	1.64	0.67	0	2.8	16



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene. DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

CASSAVA flour

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	32	0.16	0.17	0.026	0.034	0	0.4	2.7
30 grams	96	0.48	0.51	0.078	0.102	0	1.2	8.1
100 grams	320	1.6	1.7	0.26	0.34	0	4	27



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene. DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

CABBAGE, boiled

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	2.2	0.102	0.19	0.017	0.009	0.7	2.01	2
30 grams	6.6	0.306	0.57	0.051	0.027	2.1	6.03	6
100 grams	22	1.02	1.9	0.17	0.09	7	20.1	20



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene. DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

EGG, raw

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	14.7	1.258	0	0.183	0.111	14	0	4.7
30 grams	44.1	3.774	0	0.549	0.333	42	0	14.1
100 grams	147	12.58	0	1.83	1.11	140	0	47



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene. DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

PUMPKIN leaves

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	2.1	0.272	0.27	0.32	0.02	8	0.1	2.5
30 grams	6.3	0.816	0.81	0.96	0.06	24	0.3	7.5
100 grams	21	2.72	2.7	3.2	0.2	80	1	25



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene. DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

ORANGE FLESHED SWEETPOTATO ROOTS, boiled and mashed

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	7.6	0.137	0.25	0.072	0.02	58.8	1.28	0.6
30 grams	22.8	0.411	0.75	0.216	0.06	176.4	3.84	1.8
100 grams	76	1.37	2.5	0.72	0.2	588	12.8	6

kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene. DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate



VEGETABLE OIL

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	88.4	0	0	0	0	0	0	0
30 grams	265.2	0	0	0	0	0	0	0
100 grams	884	0	0	0	0	0	0	0

kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene. DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate



BEANS, boiled and mashed

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	12.7	0.867	0.64	0.22	0.1	0	0.12	13
30 grams	38.1	2.601	1.92	0.66	0.3	0	0.36	39
100 grams	127	8.67	6.4	2.22	1	0	1.2	130

kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene. DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate



WHITE-FLESHED SWEETPOTATO ROOTS, boiled and mashed

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	7.6	0.137	0.25	0.07	0.02	0	1.28	0.6
30 grams	22.8	0.411	0.75	0.21	0.06	0	3.84	1.8
100 grams	76	1.37	2.5	0.72	0.2	0	12.8	6

kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene. DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate



SWEETPOTATO LEAVES, cooked

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	3.4	0.23	0.19	0.06	0.026	4.6	0.15	4.9
30 grams	10.2	0.69	0.57	0.18	0.078	13.8	0.45	14.7
100 grams	34	2.3	1.9	0.6	0.26	46	1.5	49

kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene. DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate



WHITE MAIZE flour

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	36.1	0.693	0.96	0.238	0.173	0	0	2.5
30 grams	108.3	2.079	2.88	0.714	0.519	0	0	7.5
100 grams	361	6.93	9.6	2.38	1.73	0	0	25



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene. DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

FISH, Sardines

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	11.2	2.14	0	0.09	0.04	4.3	0	1.1
30 grams	33.6	6.42	0	0.27	0.12	12.9	0	3.3
100 grams	112	21.4	0	0.9	0.4	43	0	11



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene. DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

FISH, small, dried, freshwater

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	33.5	5.86	0	0.25	0.52	0	0	2.8
30 grams	100.5	17.58	0	0.75	1.56	0	0	8.4
100 grams	335	58.6	0	2.5	5.2	0	0	28



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene. DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

RED PALM OIL

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	86.2	0	0	0	0	500	0	0
30 grams	258.6	0	0	0	0	1500	0	0
100 grams	862	0	0	0	0	5000	0	0



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene. DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

BANANA, fresh and ripe

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	8.9	0.11	0.26	0.03	0.02	0.3	0.87	2
30 grams	26.7	0.33	0.78	0.09	0.06	0.9	2.61	6
100 grams	89	1.1	2.6	0.3	0.2	3	8.7	20



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene. DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

BAOBAB, pulp

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	30.5	0.42	0.51	0.19	0.03	0	20.1	1.3
30 grams	91.5	1.26	1.53	0.57	0.09	0	60.3	3.9
100 grams	305	4.2	5.1	1.9	0.3	0	201	13



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene.
DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

Juice from an ORANGE

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	4.7	0.094	0	0.01	0.007	1.1	5.32	3
30 grams	14.1	0.282	0	0.03	0.021	3.3	15.96	9
100 grams	47	0.94	0	0.1	0.07	11	53.2	30



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene.
DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

MANGO, ripe

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	6.5	0.05	0.18	0.01	0	3.8	2.77	0.6
30 grams	19.5	0.15	0.54	0.03	0	11.4	8.31	1.8
100 grams	65	0.5	1.8	0.1	0	38	27.7	6



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene.
DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

PAPAYA, ripe

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	3.9	0.06	0.18	0.01	0.01	13.5	6.2	3.8
30 grams	11.7	0.18	0.54	0.03	0.03	40.5	18.6	11.4
100 grams	39	0.6	1.8	0.1	0.1	135	62	38



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene.
DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

WATERMELON, raw

	Energy	Protein	Fibre	Iron	Zinc	Vitamin A	Vitamin C	Folate
	kcal	g	g	mg	mg	mcg RAE	mg	mcg DFE
10 grams	3.9	0.06	0.04	0.02	0.01	2.8	0.81	0.3
30 grams	11.7	0.18	0.12	0.06	0.03	8.4	2.43	0.9
100 grams	39	0.6	0.4	0.2	0.1	28	8.1	3



kcal= kilocalorie. RAE: retinol activity equivalent: 1 RAE = 1 mcg retinol, 12 mcg beta-carotene.
DFE: dietary folate equivalent: 1 DFE= 1 mcg food folate

Activity 5.1 Vines for Planting: Clean and Multiplied

In this field activity participants will learn to identify clean planting materials, take vine cuttings, cut them into planting materials, learn how to plant them in a rapid multiplication bed, discuss how to care for them, when and how to plant them out, and calculate vine multiplication rates.

Objectives

Participants will be able to:

- Identify, select and conserve clean sweetpotato planting materials
- Explain the principles of positive and negative selection and preservation of sweetpotato planting materials
- Calculate vine multiplication rates
- Describe how varieties' rates differ



Time

2.5 hours plus travel time to the field and back – best done in morning.

Materials

- Nearby planted sweetpotato field with some virus infected plants
- Half completed nursery bed
- 5 cutting knives
- 2 full watering cans
- 2 hand hoes
- A nearby rapid multiplication plot which had been planted 8 weeks prior to the course with two varieties with different multiplication rates
- Flip chart
- Pens

Preparation

- Make arrangements with the owner of the field for the participants to visit, select and take vine cuttings. It should be a field with virus and weevil problems, so the participants can practice negative selection (i.e. roguing diseased material and discarding unhealthy material and only selecting planting materials which look healthy, and disease and pest free).
- Set up a rapid multiplication plot 8 weeks prior to the course planted with cuttings of two varieties with very different multiplication rates, e.g. 1sqm (50 cuttings) of Variety A, 1 sqm (50 cuttings) of Variety B.
- Set up half a rapid multiplication bed at the field, so the participants can complete it and then practice planting out the cuttings they have taken, shading, and watering it.

Suggested Steps

1. Explain that the group are going to collect planting materials to set up a rapid multiplication plot, as though the on-set of the rains are close. Go to the field.
2. At the field, ask the participants to get into groups of 5 people, and to imagine they were farmer multipliers setting up their rapid multiplication plots to produce planting materials both for their own field and to sell. Ask each group to work in different areas of the field. Give them 5 minutes to walk around together and find some very healthy and some virus infected plants. The facilitator should move between the groups to check they are able to correctly identify the virus infected plants.
3. Call the whole group together, and ask them 'if they were farmers where would they select their planting materials from?' Use probing questions to ensure they discuss:

- Selection from clean healthy plants;
 - The need to rogue out any virus infected plants in the field;
 - The process of taking a cutting (which portion of the vine, why we don't use the part of the vine closest to the soil (e.g. Likelihood of weevil infestation), number of cuttings, length of cuttings (e.g. 3 nodes (~20cm) long), best time of day to take cuttings (e.g. Early morning or late afternoon)).
4. Give each group of 5 people a knife and ask each group to cut a total of 20 cuttings each 3 nodes long (~20 cm lengths) from healthy sweetpotato plants, and to bring them to the site of the half prepared rapid multiplication nursery bed.
 5. Ask them where they should put their cuttings before they plant them and why? (e.g. in the shade of the tree to keep them cool and fresh). Ask them how they should transport planting materials if they needed to take a large quantity of them by vehicle to a different area (e.g. help them discuss why they should transport them as soon as possible after harvest, and in the early morning when it is cool and in an open truck; using jute sacks or pierced polypropylene sacks to increase ventilation; not squashing the vines by overloading the sacks or truck; labelling the sacks with variety name, harvest date and multipliers contact details; 50 cuttings typically weighing 1kg etc.).
 6. Ask the whole group to move to the rapid multiplication plots which were set up 8 weeks before the course. Explain to the group that the two plots (e.g. 1 sqm of Variety A, and 1 sq m of Variety B) have different varieties in them, and that some varieties multiply faster than others. Ask them to cut cuttings 3 nodes long from an area of 50cm *50 cm of the plot of Variety A and an area of 50cm *50cm of the plot of Variety B. They should count how many cuttings of Variety A and of Variety B they obtained from this small area and then calculate how many cuttings of each variety they could obtain from the 1 sqm plot. Use a flip chart to note their findings. Ask them to put the cuttings in the shade keeping the two varieties separate.

Then discuss the different multiplication rates of the two varieties, and how this will influence their calculations about the time, space and start cuttings needed to produce a set amount of planting material. Explain how at 6-8 weeks the vines in the rapid multiplication plot can be harvested, and each of the new cuttings planted out in an adjacent area of the rapid multiplication plot, and then after a further 6-8 weeks they can harvest cuttings from *both the initial cuttings and the second lot of cuttings – (two cycles in 4 months)*; a total of 4 harvests can be made from the cuttings. Ask them what differences they noted between cuttings taken from the farmer's field and those taken from the RMT plot.

The facilitator should explain how QDS/QDPM inspections are done, and the participants could practice assessing SPVD or weevil incidence in the RMT plot. Explain that you will work more on planting material multiplication and dissemination plans and strategies on Day 7 of the course.

1. Show them the half-prepared rapid multiplication nursery bed. Ask them where one should site the nursery bed and why (e.g. somewhere not too far from a water source so it can be irrigated, protected from livestock, easy access for the farmer so they are more likely to monitor it regularly). Ask them to look at the half-made nursery bed and discuss important aspects of it (e.g. the nursery bed should be made of loose fertile soil, raised 20cm above ground level to prevent water logging, farm yard manure or NPK fertilizer (at 100g/m²) can be added to increase fertility and vine production, need to lightly irrigate the bed before planting). Ask them to help complete the nursery bed.
2. Ask two people to show the others how they would plant their cuttings in the nursery bed. After watching, ask the group what the important aspects were: spacing, ensuring at least two nodes were under the soil level, making sure the vine was the right way up etc. Then after discussing these aspects, ask them to plant the rest of their cuttings in the nursery bed using a spacing of 10cm * 20cm.

3. In their small groups (5 people) ask them to discuss for 3 minutes how they would now take care of the nursery. Then in plenary, ask each group to share one key care taking task. Ensure they mention: irrigation (2 times each day, in early morning or later afternoon), shading, protecting from livestock, monitoring (frequency), roguing of any virus infected plants. Ask two of them to gently irrigate the new cuttings.



Activity 5.2 The Triple S System: Storing in Sand and Sprouting

Objectives

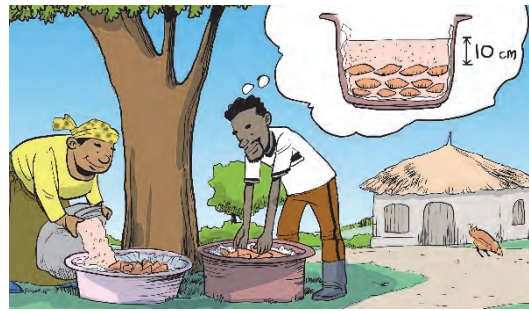
Participants will have experience in setting up the Triple S system.

Time

90 mins

Materials

- 200 sweetpotato roots – some damaged and a range of sizes
- 6 plastic basins
- Newspaper
- 5 buckets
- 5 brooms
- Plus, one Triple S system set-up 3 months in advance of the tot course so that the students can see the sprouting roots



Advanced Arrangements Required

Set up a Triple S system 3 months before the ToT course, so the students can uncover the roots and find them sprouting and can practice planting them out.

Suggested Steps

1. Ask participants to get into 5 groups. Explain that they will practice setting up the Triple S seed system which they have just learnt about in the presentation. Ask them to divide the roots into 5 groups and each group to carry their roots to a different area of the room. Ask them how they will decide which roots to use in their Triple S system. Get them to find some examples of damaged roots, and to explain why they would not use those ones.
2. In their small groups ask them to work together to set up a Triple S system. The facilitator should move around the groups to check they are:
 - Selecting their roots carefully, and using small or medium-sized undamaged roots,
 - Stacking their roots carefully in the container,
 - Letting their sand cool before using it,
 - Covering their roots with a top layer of at least 10 cms of sand.
3. Ask one person from each group to come to a central table and ask them to together explain and repeat the process of setting up the Triple S system as though they were demonstrating it to a group of farmers. The facilitator should watch carefully, and make sure they are following the correct steps and clearly explaining why they are doing what they are doing. At the end, invite a discussion from the whole group about how they could have done their demonstration differently, also ask them to think about when during the season they would set up their Triple S system (*e.g. at the start of the dry season*).
4. Ask two of the participants to explain to the others where they are going to now store their Triple S system, and what monitoring or care (*e.g. cool, dry, safe place, away from children and chickens*) it needs for the next few months, and what they might expect to see changing in it (*e.g. sprouting, and if this happens too early >3 months before the rains are expected then the sprouts can be removed*).
5. Ask another two of the participants to explain what the next steps are before the rains arrive
 - About 6-8 weeks before the rains start, plant the sprouting roots in a nursery bed near the home. The soil needs to be fertile and the area fenced against grazing animals.
 - Bury the whole of the root and sprouts, unless the sprouts are very long. Plant the

sprouting roots at a spacing of 60 x 60 cm (~2 ft x 2 ft) and in a slight depression at a depth of about 10 cm (to help watering).

- The roots should be watered at planting, then twice / week for 2 weeks, then once/week.
 - By the time the rains come, the roots will have sprouted vigorously, and large amounts of planting material can be cut. Just 40 roots can generate ~1,500 cuttings. [10 mins]
6. Bring out the Triple S system which was set up a few months in advance of the ToT course and ask the participants to uncover and take out the sprouting roots. If there is time the group could practice planting some of the roots which had already sprouted.

Activity 5.3 Planning Your Multiplication and Dissemination Strategy

Objective

Participants will design a dissemination program for two different scenarios to reach 5,000 households with clean planting material of known origin.

The two scenarios are:

Scenario 1

El Nino destroyed crop in Northern Zone, relief agency needs to supply 4 kgs of planting materials to each of 5,000 households (HHs) before the next rain season in 9 months' time. Plan.

Scenario 2

Your project aims to improve the vitamin A intake (through OFSP consumption) of a total of 5,000 HHs with children under 5 years old across three dispersed regions of Country X within 3 years, and to build sustainable decentralised seed systems in all 3 of these regions. Each household should receive 2 kgs of two different varieties of OFSP to test. Plan.

Time

3 hrs

Materials

- Flip chart
- Markers
- 35 copies of blank template of sweetpotato activity calendar
- 35 copies of worksheet for calculating your sweetpotato multiplication strategy
- 35 copies of template of sweetpotato dissemination plan

Suggested Steps

1. Explain to the participants that they are going to design a dissemination program for two different scenarios to enable them to reach 5,000 households with clean sweetpotato planting materials. Ask them to get themselves into groups of 8 people, if possible each group should contain an extension worker and if possible a programme manager. Ask the groups to choose a leader and a rapporteur.
2. The groups need to discuss and agree on the following aspects for each scenario:
 - a) When are the rain seasons (approximate start and end dates)?
 - b) Is the area unimodal or bimodal? How long is the dry season – are there rivers, swamps etc. which could be used for planting material multiplication and/or conservation?
 - c) What is the population density? Where are most of the farms located (i.e. close to transport infrastructure for easy distribution)?
 - d) What is the existing sweetpotato seed system?
 - e) What infrastructure and organisations are available to support multiplication activities: e.g. research stations, existing farmer multipliers, NGOs, private sector multipliers?
 - f) What infrastructure and organisations are available to support dissemination or distribution (e.g. schools, health centres, markets which could be used)?
 - g) What is the most common method of transport (in particular to transport vines: i.e. foot, bicycle, existence of traders for vines and roots)?
 - h) Where are the nearest markets located?
 - i) Which types of sweetpotato are preferred in these markets. Are there any gender or age

differences in preferences? Are there any preferences depending on utilization (e.g. fresh roots, processed)?

- j) Which OFSP varieties have similar characteristics to those preferred by the market?
 - k) Do any of these OFSP varieties with the preferred market characteristics also have virus resistance?
3. Then ask each group to develop the sweetpotato vine multiplication and root production calendar for their target regions. Encourage the participants to work backwards from the start of the rainy season (i.e. when planting material should be available to farmers) to plot when the different steps of their project's planting material multiplication and dissemination activities need to occur. They should work together on a large flip chart version of the calendar first and then transfer this to the A4 handout sheets (see Handout 5.11.3a Calendar).
 4. Explain that each group will develop two different sweetpotato dissemination plans: one for mass dissemination (Scenario 1) and another for annual access through DVMs (Scenario 2).

Scenario 1

The plan for the emergency distribution (Scenario 1) should be able to reach 5,000 households (HH) with 4kgs planting materials/ household within 9 months. They can choose either variety A or B.

Scenario 2

The DVM based strategy (Scenario 2) should be able to reach 5,000 households (HH) with each household receiving 2kgs of planting materials of variety A and 2kgs of planting materials of variety B within 3 years and should have a basis for sustained production of planting material to continue after the end of the project intervention.

Note: Variety A has a multiplication rate of 1:10 after 4 months. Variety B has a multiplication rate of 1:30 after 4 months.

The groups should use the blank worksheet (Handout 5.11.3b) to help with the calculations. They need to complete all the highlighted cells first, and then work step by step through the calculations.

The groups should start by working on answering the questions in the Handout 5.11.3c for each of their Scenarios, they should highlight any challenges they anticipate on a flip chart.

The facilitator will need to move around between the groups and help them to use the multiplication rates (see Box 5.5) in their calculations to determine the timing, size, type, location and number of multiplication plots required. Make sure they also put their information together in a way that can then be briefly presented and shared with the other participants during a short presentation.

1. Presentation of plans. Each group has 10 minutes to present their plans (5 min per plan) to the rest of the participants. Then discuss the challenges the groups faced during the exercise and how they overcame them, what additional information they felt they needed, what differences they saw between the way different groups worked on the exercise.
2. The facilitator can then summarise the session by highlighting the following key points:
 - Develop your sweetpotato vine multiplication plan at least 9 months before you need the planting materials.
 - From the group work we found that key administrative and agricultural information requirements include: population density, population figures per agreed administrative unit; number of extension workers/ work load/ priority crops/ number of farmer groups each extension worker is meant to cover/ transport provision for extension worker/ lunch allowance/ per-diem rate/ availability of in-service training to include sweetpotato in.
 - It is important to understand the different multiplication rates of different sweetpotato varieties and in different locations and under different management and the need to

keep records in order to be able to plan more accurately in future seasons.

- Plan to produce sufficient materials to cover some losses due to drought, pests, livestock, theft, loss during packing, transportation (at least 10%) etc.
- Together with your project's managers and finance team cost each activity in advance to enable you to plan timely availability of funds.

Sweetpotato Agricultural Calendar Handout

Sweetpotato activities	Months													Who does the activity?
	O	N	D	J	F	M	A	M	J	J	A	S		
Short rains														/
Long rains														
Conservation of planting materials														
Multiplication of planting materials														
Purchase of planting materials														
Record keeping														
Land preparation														
Ridging														
Planting														
Weeding (1 st , 2 nd , 3 rd)														
Monitoring of crop														
Leaf harvesting as vegetable														
Uprooting of any virus infested plants														
Hilling up														
Piecemeal harvesting														
Final harvesting														
Transporting SP from farm to home														
Transporting SP from home to market														
Marketing of fresh sweetpotato roots														
Preparation of fresh roots for meals														
Sun drying of chipped sweetpotato														
Storage of dried sweetpotato														
Purchase of sweetpotato roots														
Other:														
Other:														

Worksheet for Calculating Multiplication Strategy Figures

	A	B	C	D	E	F	G	H
1	No. of cuttings required per household:							
2	Planting spacing = no. of cuttings/ sq m:							
3	Level of multiplication	Proposed size of each multiplication plot (sqm)	Months working backwards	Target no. of households and timing (200 cuttings/hh)	No. of cuttings of variety B	Area required (50pp/sqm)	No. of multipliers needed	Multiplication rate in a 4 month period
4	Farmer root production		Nov-13		—			
5					Step 1. = total no. of cuttings needed = target no. hh x no. cuttings per hh =D4xD1			
6			Oct-13					
7			Sep-13					
8			Aug-13					
9	TMS		Jul-13		—			
10					Step 2. =no. of cuttings reqd at TMS level =no. cuttings reqd by farmers / multiplication rate at TMS level =E4/H9	Step 3. = area reqd at TMS level =no. of cuttings required/ planting density of cuttings =E9/D2	Step 4. = no. of multipliers needed =total TMS area reqd/ size of each TMS plot =F9/B9	
11			Jun-13					
12			May-13					
13			Apr-13					
14	SMS		Mar-13		—			
15					Step 5. =no. of cuttings reqd at SMS level =no. cuttings reqd by TMS level / multiplication rate at SMS level =E9/H14	Step 6. =area reqd at SMS level=no. of cuttings reqd at SMS level/ planting density of cuttings =E14/D2	Step 7. = no. of multipliers needed =total SMS area reqd/ size of each SMS plots =F14/B14	
16			Feb-13					
17			Jan-13					
18			Dec-12					
19	PMS		Nov-12		—			
20					Step 8. =no. of cuttings reqd at PMS level =no. cuttings reqd by SMS level / multiplication rate at PMS level =E14/H19	Step 9. =area reqd at PMS level =no. of cuttings reqd at PMS level/ planting density of cuttings =E19/D2		

Template for Sweetpotato Planting Material Multiplication and Dissemination Plan

What	When	Who	How	Cost
<p>1. Identify target communities and record their sweetpotato vine multiplication, root production and post-harvest activity calendar and varietal preferences and options.</p>				
<p>2. Agree on the scale of your initial planting material distribution.</p> <ul style="list-style-type: none"> • No. of districts, • No. of households, • No. of varieties, • Quantities of planting materials/ household • Monitoring data requirements • Available budget 				
<p>3. Make a calendar (<i>see example in manual</i>) showing when and where the multiplication activities are needed.</p>				
<p>4. Multiplication implementation phase</p> <ul style="list-style-type: none"> • Calculate for variety A and/or B <ul style="list-style-type: none"> - The quantity of planting materials required for 5,000 households to receive 4 kgs each. - The quantity of planting material required if 50 cuttings are planted per m² using for variety A a multiplication rate of 1:10 after 4 months, and for variety b a multiplication rate of 1:30 after 4 months. • Calculate the number of months required to provide 5,000 households with 4kgs planting materials for scenario 1. • Calculate the timing of DVM multiplication operations to ensure 5,000 have 2kgs of each variety (A and B) within 3 years for scenario 2. • Plan timing and scale of land preparation and field activities including harvesting, packaging and labelling. 				
<p>5. Pre-distribution activities</p> <ul style="list-style-type: none"> • Community awareness raising on OFSP • Group meeting to organise who will receive planting materials and when, & communication strategy • Transport arrangements (vehicle size, timing, destinations & routes) 				

<ul style="list-style-type: none"> Community meetings: Advanced notification to communities of exactly when the planting materials will arrive (or when they can collect them), and demonstration of how they should handle and then plant them, and what prior field preparations they need to make 				
6. Distribution				
7. Monitoring				
8. Planning for distribution in subsequent years				

Activity 5.4 Working with DVMs

Objectives

Participants will understand the benefits of and training requirements for a successful DVM strategy.

Time

2.5 hrs

Materials

- A nearby sweetpotato demo plot with two distinct varieties separated, labelled and containing clean planting material
- Second plot with a mixture of clean/ virus infected planting material and mixtures of varieties is required for training
- Flip charts
- Marker pens
- Masking tape
- Copies of the above Handouts



Advanced Arrangements Required

Locate or plant two nearby sweetpotato plots with two varieties planted separately in each. Rogue one to remove any diseased material, leave the other plot in the hope that virus infection and symptoms occur.

Suggested Steps

1. Use discussion and open-ended questions to get the participants to share their understanding of:
 - How to select and multiply disease and pest free vigorous planting material.
 - The point of labelling planting materials.
 - The point of keeping different varieties distinct.
2. Use the pictures in the Handout to stimulate discussion on the challenges associated with vine dissemination. Ensure all participants contribute to the discussion.
3. Explain to the participants that you are now going to visit two sweetpotato planting material nursery plots. Ask them to work in groups of five people, and on arriving at the nursery plots to carefully observe the plants in both plots and to think about why they would choose one of them as a planting material multiplication plot. Ask the participants to select planting material from the two plots and return with them to the learning room. Ask representatives from two of the groups to present their observations and thoughts about the nursery plots and the planting materials in them. Use probing questions to ensure that planting material health, the importance of separating different varieties, and roguing are mentioned.
4. Ask the participants in their groups to think about how they might select a decentralized vine multiplier (DVM) in their target area. (The participants should work in the same groups as for the prior activities when they developed their two-planting material multiplication and dissemination strategies). They should come up with a list of 10 criteria they would use for selecting DVMs and should explain why each criterion is important. They should also think about whether their criteria might exclude any particular groups of the community and whether that could be a problem for their project and how they might overcome that. Ask each group to record their findings on a flip chart (using a table like the one shown below) and then stick the flip charts up on the wall.

DVM Selection Criteria	Reasoning behind that selection criteria	Who might these criteria exclude, and what could be done to overcome that
1		
2		

- The participants should look at each of the flip charts and see whether there are any key differences between groups. (The facilitator can also refer to the DVM selection criteria mentioned in Unit 6).

The whole group should then choose 12 key DVM selection criteria, these should be recorded on another flip chart. The facilitator can then demonstrate how these criteria could be used to identify and select DVMs during a project, or to rank different DVMs to help in deciding which ones to work with.

The facilitator should raise the discussion of whether a project should focus only on existing farmer multipliers or should focus only on training other farmers or entrepreneurs to become DVMs, or whether to use a mixture of the two approaches and why. The facilitator should highlight the problem that many farmers claim to be farmer multipliers and it may be wise for a project to visit the target area at the beginning of the rains and find out who is actually selling planting materials and in what quantities.

- In their groups ask the participants to discuss and identify the training needs they think DVMs would have in order to ensure they could successfully produce clean healthy planting materials. Give the groups 10 minutes to discuss this and make notes on a flip chart. Then go around the groups, asking the first one to present all their ideas, and the subsequent groups to only present any new ideas which have not yet been mentioned by the others. Make a list of these combined training requirements and ensure the participants note it down. Ask them to think about how they might organize this training given the decentralised nature of the DVMs and the need for very practical learning-by-doing training approaches - if they had 4 visits to each DVM (or group of DVMs) when should those visits occur and what should be done in each of them.
- Referring to the previous activity on multiplication and dissemination calculations (Unit 10) ask the groups to calculate the amount of planting material needed for 8,000 households to each receive 2kgs (~100 cuttings) of both Variety A (*multiplication rate 1:10 after 4 months*) and Variety B (*multiplication rate 1:30 after 4 months*) and to then calculate how many vine multipliers (with what sized plots) they will need if they are to achieve this within a 3 year project (Handout 5.11.3b might assist them). Ask the groups to summarise and share the results of their calculations (3 mins per group), highlight any key issues or mistakes that arise.
- Ask each group to select one person to act as a DVM. The others will then interview the DVM on the costs associated with their vine enterprise and use Handout 5.11.4b and Table 5.XX to calculate the profit the DVM is making.
- Ask the participants to raise any problems they faced when using the budget analysis tool, and what suggestions they saw for improving the profitability of the DVM's enterprise.



Handout 5.11.4a.



Handout 5.11.4b.



Activity 6.1 Comparing Sweetpotato Varieties and Management Practices

Objectives

Participants will be able to help farmers set up a field experiment to compare different sweetpotato varieties or different sweetpotato management practices

Time

3 hours

Materials

- Flip charts
- Pens
- Rope
- Measuring tape
- Spades
- Labels
- Sticks
- Nearby field in which they can set up the experiment
- Topics 3, 6, and 7 of this manual
- Pages 20-22 in the handout booklet 'what is damaging my sweetpotato?'

Advanced Arrangements Required

Identify a nearby empty field with an area of about 30m * 30m, which participants can use for practising the designing and setting up of a field experiment.

Suggested Steps

1. Ask the participants to get into groups of 5 people. Explain that they are going to plan and design an experiment which they think would be useful to do with the farmers they provide services to. Remind them not to make the experiment too complex, one experiment should only test one topic at a time otherwise the results become too difficult to understand.
2. Ask them to discuss and agree on **the objective** of their experiment, and **what treatments** they will compare (too many or too few will not result in useful information, 3-5 treatments per experiment works well), make sure they remember they need to include a control treatment as well which could be the farmers' normal practice or the recommended practice. Remind them to think about:
 - a) What they are trying to find out
 - b) What treatments they are going to compare
 - c) Which farmers they should involve in planning, managing and evaluating the experiment (recognizing that in this particular exercise farmers have not had a chance to participate as fully as would be the case in reality)
 - d) How often they would need to visit their experiment and what they would observe or measure at each of those visits
 - e) How they could be sure that the results of their experiment were reliable? (e.g., mention the concept of replication, and that they should replicate their treatments at least 3 times to increase their confidence that any differences in results between treatments are due to the treatments and not to the soil type in the corner of the field where that treatment happened to be placed) [Note: In a community it is also possible to replicate trials over farms. This is the way we do on-farm variety trials.]
 - f) How large would each of their plot sizes be

- g) How they would invite other farmers and extensionists to share the learning from the experiment, and how could they best present their experiment to these visitors (e.g. farmer to farmer explanations, clear labels, participatory evaluation by the visitors?)

Give each group a few empty flip chart pages to design their experiment, reminding them that they will need to present it to the rest of the participants

1. Ask each group to present their experiment's objectives, treatments, and design. Then ask the whole group to read through pages 20-22 on Experimenting in their handout booklet, 'What is damaging my sweetpotato?' Let the group discuss whether they need to make any further changes to their experiment
2. Move to the nearby field and ask each group to take one area of their field and set up as much as possible of their experiment, including the labels. Demonstrate to the participants how to lay out a right angle, to produce rectangular or square plots. [Note they will not have sweetpotato planting materials so will need to imagine these, they can lay out the different plots and make clear labels (including pictures) to show what is in each plot]. Explain that they have 1 hour to do this and then the whole group will tour each experiment. The facilitator will move around between groups ensuring they have thought carefully about the layout of the field e.g. any slopes, the size of their different plots, randomizing the treatments, and clear labelling. The facilitator can demonstrate simple field randomization.
3. As a whole group tour the field imagining that you are visitors to the experiments about 3 months after planting. Discuss:
 - a) any aspects of the layout which do not work well and how you could improve them?
 - b) when and how you would evaluate the trials with farmers?
 - c) why it would help farmers to create, visit and evaluate an actual field experiment as opposed to just hearing a presentation about it?
 - d) why labelling the different treatments is important?
 - e) why it is important that women as well as men farmers are involved, and that farmers from different wealth groups are involved?
4. Ask the participants to copy the objectives and design of their own experiment, and any of the other experiments they thought might be useful into their notebooks and to highlight the key points they need to remember when setting up experiments with farmers.



Activity 6.2 Advanced Planning

Objectives

Participants will understand the different stages of the sweetpotato crop cycle and the management implications of each stage

Time

75 mins

Materials

- Flip chart sheets
- Marker pens
- Pencils
- Masking tape

Suggested Steps

1. Ask the participants to get themselves into groups of 10 people (preferably all working in the same geographical area so that the timing of their rainy seasons are similar). Ask them to identify two of them to act as facilitators to obtain as full a sweetpotato activity calendar as possible. Remind them:
 - a) to mark the rainy seasons and months of the year on the calendar,
 - b) to start by thinking carefully about all the activities they do related to sweetpotato production and postharvest aspects,
 - c) to include a way of showing who in the household typically does the job, and if it is a combination of the wife and the husband what percentage of the task is done by each (the sweetpotato cropping calendar in Appendix 11.2 may be helpful),
 - d) that they can use pictures and symbols as well as words in their calendar,
 - e) that they will need to present their calendars to the rest of the participants, and
 - f) to leave about 5 empty activity rows at the bottom of the calendar
2. Now ask the participants if they were to carefully conserve their healthy planting materials during the dry season, when they would need to select their planting materials and how they might conserve them during the dry season. Ask them to think about the process of multiplication of their planting materials in advance of the rains in order that they have sufficient planting materials for planting their whole field (they should specify the size of their field) at the start of the rains. They need to discuss and think about, and then add onto their calendar (in the empty rows at the bottom):
 - a) when they would select their healthy clean planting materials from their previous crop
 - b) how they would conserve those planting materials during the dry season, including their watering
 - c) preparation of their multiplication nursery bed,
 - d) taking of and planting of clean healthy cuttings from their conserved planting materials,
 - e) maintenance of their multiplication plot,
 - f) harvesting of their cuttings (note this may include ratoon harvesting, aka several subsequent harvests).
3. Now have all the participants move around each group's calendar one by one, as the owning group makes a brief presentation regards it. Encourage questions and discussions about:
 - a) problems the participants foresee with the need for advanced planning and

- conservation of planting materials
- b) gender aspects of the labour and market returns currently involved in sweetpotato production, and what these gender roles mean regards who they need to train on sweetpotato production
- c) other activities for which it is crucial to plan in advance
- d) other aspects of farm and household operations and labour availability, as a reality check

Activity 7.1 Field Hunting for Sweetpotato Pests and Diseases and Learning How to Manage Them

Objectives

Participants will be able to find field examples of the key pests and diseases of sweetpotato and explain and show the damage each can cause

Time

85 mins plus transport time

Materials

- A nearby young crop with SPVD in it;
- A field which previously had sweetpotato in it;
- A mature or old sweetpotato crop which participants can explore and find diseases and pest damaged sweetpotato plants in;
- 20 digging sticks;
- 8 buckets for carrying infested roots;
- 8 sacks;
- 20 transparent collecting pots or jars with lids with a few small holes in them;
- 20 magnifying lenses;
- participants should carry their notebooks and pencils;
- Flip chart and stand;
- Marker pens;
- Tape.

Advanced Preparations

Identify one nearby field with a young crop with SPVD in it, a field which previously had sweetpotato in it, and a mature or old sweetpotato crop, which participants can explore and find diseases and pest damaged sweetpotato plants in.

Suggested Steps

1. Split the participants up into small groups of ~6 people, explain that you will be visiting nearby sweetpotato fields in order to identify sweetpotato pest and disease problems. These problems could damage the roots, the vines and leaves, or the whole plant. They should also be trying to find the insects or other types of pests which have caused the damage and collect them in the collection jars to then show to the other groups. [5 mins]
2. Journey to sweetpotato field.
3. Pest and disease hunting. Give each small group a couple of digging sticks and collection jars, and a bucket or sack. Ask each of the groups to cover different areas of the fields. Give them 20 minutes to hunt for insect pests, and signs of pest and disease damage on sweetpotato - which they should collect samples of for the field discussion session. Remind them that they should try and observe the pests in action to gain a better understanding of what the pests do and how they damage sweetpotato. While the groups are hunting, the facilitator must move around between the groups ensuring that each group sees some virus disease, some aphids and whiteflies, and some weevil damaged roots.
4. Call them for the discussion under a shady tree near the fields. Ask each group to display their infested roots, leaves etc. and collection jars on their sack. As a whole group move around from sack to sack hearing about what each of the small groups observed and collected. If they have all collected similar things, speed up the exercise by asking

- subsequent groups to describe and show anything different they saw or collected.
5. Using open probing questions, the facilitator should ask the participants to share their observations and thoughts on:
 - a) What the pest was doing when they saw it,
 - b) How it causes damage,
 - c) Where it might have come from,
 - d) How it survives during the season when there is no sweetpotato crop in the field, and
 - e) How diseases spread.
 6. Ask one of the participants to act as a rapporteur and record the suggestions and questions on a flip chart. Pack the plant parts and collection jars containing the insects back into the sacks ready to take to the training room.
 7. The facilitator should take the group back into the field and ask them what they might do to help prevent pest or disease infestations in their sweetpotato field, and what they can do if such infestations do occur to prevent them from spreading and causing further damage. The importance of clean planting materials, resistant varieties, field sanitation, regular monitoring, natural enemies, hilling-up, regular roguing and timely harvesting should be discussed. Each participant should practice some hilling-up of exposed roots and some roguing of virus infested plants.

Activity 7.2 Hidden Damage: The Importance of Understanding Lifecycles

Objective

Participants will understand the different life cycle stages of the sweetpotato weevil, and which stages cause serious damage

Time

1 hour

Materials

- About 50 weevil-infested sweetpotato roots;
- 20 wooden boards;
- 20 sharp knives;
- 20 magnifying lenses;
- 40 dishes or plastic bags;
- 1 set of scales for weighing the damaged and undamaged portions of the sweetpotato roots;
- Participants' notebooks and pencils.

Advance Preparations

Collect some weevil infested sweetpotato roots a couple of weeks before the training course. The participants may find some during their field hunt but, in case they do not, the facilitator should be sure they have some for the participants to dissect to see the eggs, larvae, pupae and feeding tunnels. This may require artificially investing roots in the laboratory if field invested examples are not easily available at the time of the course.

Suggested Steps

1. Remind the participants that they saw and collected damaged sweetpotato roots and vines in the field. Working in pairs, you now want them to cut open these roots (and vines) and look for different life cycle stages of the insect pests inside the roots [*Note: they will have just had a lecture on the lifecycles of key sweetpotato insect pests and diseases*]. Each pair should work with at least 5 damaged roots. They need to weigh their roots at the beginning before they start cutting them and record this total weight in their notebooks. They should then carefully begin to cut open the roots and search for the different lifecycle stages in the root and investigate them using their magnifying lenses: they can draw a sketch of each of the different life cycle stages they find. As they cut up the roots, they need to keep the undamaged portions on one side and the damaged portions on the other side. The facilitator should move around the pairs helping them to: identify the eggs, larvae, pupae and adult stages of the sweetpotato weevils; ensuring they see the feeding tunnels; helping them to separate the damaged (inedible) parts of the roots from the undamaged parts.
2. When they have finished dissecting their roots they can put all the damaged portions into one bag and weigh them and record the weight. They can then do the same for the undamaged portions of the roots. They should then calculate what % of the total roots was inedible as a result of this insect damage.
3. The facilitator should then ask the groups what they have learnt from the exercise. Areas to probe include:
 - a) How important it is to understand what the different lifecycle stages of an insect look like so that farmers can link the presence of the seemingly harmless adult stage with the damage that occurs later caused by the larval stage?

- b) How might they reduce the spread of these pests and limit the damage they cause?
 - c) What proportion of the edible roots can be lost due to sweetpotato weevil infestation?
 - d) What effect does this damage have on the marketing of sweetpotato weevils?
 - e) If you stored weevil infested roots next to clean uninfested roots, what might happen?
4. Clearing up.

Activity 7.3 Training Others on Key Sweetpotato Pests and Diseases

Objectives

Participants will have experience in using their field observations to develop training approaches and materials for training others (extensionists or farmers) on sweetpotato pests and diseases

Time

1 hour and 45 mins

Materials

- The root and vine and insect materials they collected during the field hunt that morning;
- Flip charts;
- 40 marker pens;
- Masking tape;
- Magnifying lenses;
- 3 packs of stickers/ Post-its;
- Participants' notebooks and pens.

Suggested Steps

1. Divide the participants into small groups (~3 people per group) and allocate each group a sweetpotato pest or disease (e.g. sweetpotato weevil, sweetpotato virus, mole rats, rough sweetpotato weevil, armyworm). Explain that each group has 20 mins to prepare a 5-minute presentation, folk drama or role play about their pest or disease and the damage it causes farmers. Remind them that these presentations they are developing may be useful for them when they come to train others.
2. Ask each group to share their presentation, remind them they have a maximum of 5 minutes only, and ask someone to act as the timekeeper. Ask the other participants to use stickers to make quick notes after each presentation on the things they liked about it, the information that was missing or incorrect in the presentation and a suggestion for how the presentation could be improved (one sticker per presentation). Make a flipchart page for each presentation onto which those watching can stick their review comments (this means at the end each small group will be able to look at all the comments about their presentation and get ideas for how they could have done it differently).
3. The facilitator can use the presentations as a way of assessing understanding of the topic by participants, and to help them start to think about how they will share the knowledge they are developing with others. The facilitator should invite each small group to visit the flip chart page which has comments about their presentation on it and give them 5 minutes to review and discuss those comments, before opening a 10-minute group discussion on the presentation process. The facilitator must remind participants that we learn continuously, and that listening to and responding to feedback from others is a very important part of improving our performance.

Activity 8.1 Increasing Profits Through Storing Fresh Sweetpotato Roots

Objectives

Participants will be able to estimate the yield and value of a field of sweetpotato roots as well as:

- Understand good harvesting practices in order to minimise losses during harvesting and post-harvest;
- Know how to set up a pit store for fresh root storage, select undamaged roots to place in it, and be aware of the key fresh storage problems.

Time

2 hours

Materials

- Nearby sweetpotato field which is ready for harvest and where the participants can dig up 10 plants per group to work out the yield
- Scales;
- Sack;
- Calculator;
- Pen and paper;
- Spades;
- Hoes;
- Dry grass;
- Bamboo poles;
- Harvesting sticks;
- Branches;
- Thatching grass;
- String.

Advanced Preparations

Identify or plant a nearby sweetpotato plot that the trainees can harvest in order to calculate yield.

Suggested Steps

1. Ask the participants to work in groups of ~8 people. Explain to them that they will be visiting a field and will firstly have to estimate the yield of the field and harvest some roots which they will then use to set up either a pit or a clamp store in which they can store the fresh roots. Walk to the field.
2. Once at the field, remind them that in order to store fresh roots, the roots need to be undamaged, so they should be carefully while they are harvesting and weighing the roots of their plants.
3. Ask each group to work out the sweetpotato yield of the field, using the following method. They should then compare their findings between groups, and then discuss the current per kg price of this variety of sweetpotato and use that to calculate the value of the sweetpotato in the field.
4. Explain that each group can decide whether to construct a pit or a clamp store for storing their fresh sweetpotato roots. (The facilitator should however ensure that both types of fresh root store are being constructed). Remind the participants that they should think
5. carefully about where they will site the store.

Working out the yield of your field prior to harvesting

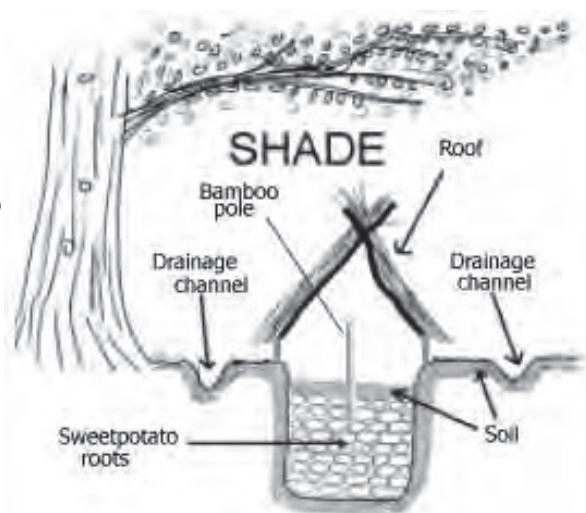
- Dig up at least 10 plants randomly selected from across your field and weigh the roots from each of them.
- Record the weight of roots for each plant. (see example below)

•	•	•	•	•	•	•	•	•	•

- Then calculate the average weight of roots per plant. To do this, add up all the weights you recorded and then divide by the number of plants you sampled. e.g. 22kgs / 10 plants = 2.2kg/plant.
- To work out the yield of your whole field. Count how many plants there are in your field and multiply that number by the average yield (e.g. average yield = 2.2kg in this example). So if you had 4,000 sweetpotato plants in your field, you would multiply 2.2 x 4,000. You can then estimate that your field has 8,800 kgs of sweetpotato roots in it.

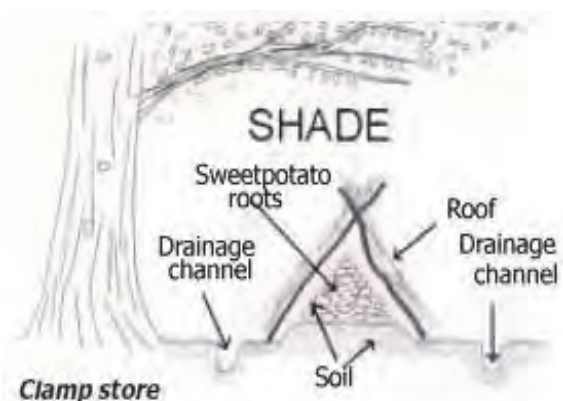
Pit Stores

Hole dug in an area of dry ground. Whilst it is often recommended that the hole should be lined with dry grass to cushion roots from damage and absorb moisture helping to prevent roots from rotting, other studies suggest it is important not to line the pit with grass- so you may wish to experiment with both methods. Place roots carefully into the pit, cover completely with more dry grass (if you are using it) and then seal with dry soil up to normal ground level. A bamboo pole should be carefully inserted through the soil to act as a ventilation pipe, ensure that its top end is high enough above ground level to reduce the chances of weevils crawling down it. Cover the pit with a raised sloping roof to shade the pit store and protect it from rain that could cause rotting. Size and shape of hole depends on the number of roots to be stored. Add a drainage channel around the store to divert rainwater.



Clamp Store

This structure should be made on a flat mound of earth raised about 10cm above ground level. Cover the flat mound (~1m wide) with dry grass for cushioning and to absorb moisture (note: you may wish to experiment with and without the dry grass layer). Carefully pile undamaged sweetpotato roots on top, then cover with more dry grass and then with a 10- 20cm thick layer of dry soil. Cover the structure with a thatched roof to protect it from sun and rain, allow a gap all the way round between the roof and mound for ventilation. Add a drainage channel around the store to divert rainwater.



After the groups have looked at each other's' clamp or pit stores, facilitate a discussion regards the issues associated with fresh root storage (e.g. off-season market prices, rotting, need for undamaged

roots, where to site the fresh root stores, monitoring of fresh root stores, re-use of fresh root stores).

Activity 8.2 Effect of Sun-Drying and Storage on Beta-Carotene Content of Orange-Fleshed Sweetpotato

Objective

Participants will understand how the processing and storage of OFSP affects its beta-carotene content

Time

30 mins

Materials

- 50 orange-fleshed sweetpotato roots;
- Chipping machine;
- Raised drying rack;
- At least 3 sample bags;
- Labels;
- Marker pens;
- Data set showing how beta-carotene content decreases with prolonged sun-drying;
- Sufficient photocopies of the data set showing how beta-carotene content decreases with prolonged storage.

Advanced Preparation

On the first day of the 10-day ToT course, prepare a small quantity of OFSP chips and place them out on a raised rack to sun-dry (this will become the 'sun-drying for 7 days sample'), on day 3 of the ToT course, chip some more OFSP and place it on the same raised rack but do not mix it with the first sample. Make sure the samples are clearly labelled and protected. On day 6 of the ToT course, chip some more OFSP and place it on the same raised rack to sun-dry, and ensure it is clearly labelled and not mixed with the earlier samples. On Day 9 of the ToT carefully collect the three samples (keep them separate) and take them into the training room and place them on a side table.

Suggested Steps

1. You will have chipped and sun-dried the different batches of OFSP in advance (see advanced preparation above). Carefully collect the three samples and keeping them separate carry them into the training room and display them on a side table, each should have a clear label that states how long they were sun-dried for.
2. Ask the participants to quietly observe the different samples, and then ask them to suggest what differences they saw between the samples and why they think these differences exist, and why they might be important.
3. If possible provide beta-carotene content estimates of the different samples and ask the participants what conclusion they can draw from this information and how does it affect sun-drying practices. (*Note: when chips of Ejumula variety were sun-dried for 1 day the beta-carotene loss was 10%, and after 3 days sun-drying it was 48% in Uganda*).
4. In addition to sun-drying, storage also affects the beta-carotene content. Provide the participants with beta-carotene content data from samples that were stored for different periods of time (see the Handout below). Give them a few minutes to study

the data and discuss it with their neighbour and then ask them to explain what happens to the beta-carotene content over time and how temperature influences this. Ask them to explain what implications this has for storage practice this information has (e.g. cool room, opaque packaging).

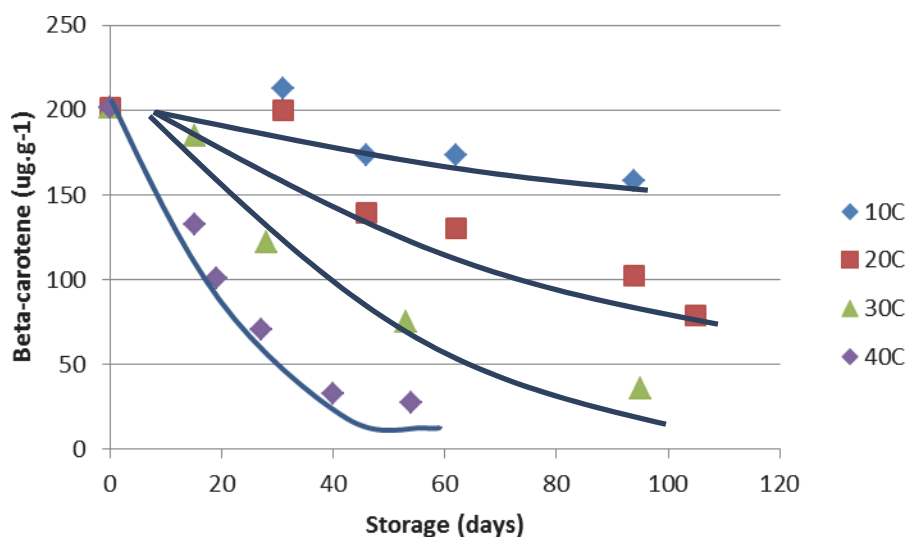
5. In summary draw out or explain that:
 - The key issue for beta-carotene retention in dried chips is storage period and not drying. “It doesn’t matter how well you dry your sweetpotatoes, if you store them for four months, you will have lost your beta-carotene.”
 - The initial beta-carotene level is also important: if you have little beta-carotene at the beginning, you will get less in the end product. If you have high levels at the start, then you will lose some, but still have enough beta-carotene at the end for the food to be nutritious.
 - Other quality issues can also occur during storage leading to off-smells, rancidity etc.

[Handout] Beta-carotene concentration of dried sweetpotato chips over different storage periods and at different temperatures.

Data set

	at 10°C		at 20°C		at 30°C		at 40°C	
Storage (days)	Average beta-carotene concentration (ug/g dwb)	Storage (days)	Average beta-carotene concentration (ug/g dwb)	Storage (days)	Average beta-carotene concentration (ug/g dwb)	Storage (days)	Average beta-carotene concentration (ug/g dwb)	
0	201.0	0	201.0	0	201.0	0	201.0	
31	212.8	31	199.6	15	184.9	15	132.4	
46	173.6	46	139.3	28	121.9	19	100.7	
62	173.3	62	130.1	53	75.0	27	70.8	
94	158.5	94	102.2	95	35.5	40	32.9	
105		105	78.8			54	27.6	

Logarithmic Degradation of Beta-Carotene During Storage of Dried Sweetpotato Chips of Ejumula Variety at 4 Different Temperatures



Activity 9.1 Substituting Sweetpotato for Wheat Flour in Chapati Recipes

Objective

Participants will know how to incorporate sweetpotato (particularly the vitamin A rich OFSP) into popular recipes that normally only use wheat flour

Time

2 hours 5 mins

Materials

Per small group:

- Sauce pan;
- Charcoal or gas stove;
- Frying pan;
- Cutting board;
- 1 litre lukewarm boiled water;
- Rolling pin;
- Grater;
- Fruit squeezer;
- Food containers;
- Bowls;
- Plates;
- Knives;
- Flip chart;
- Marker pens;
- Masking tape;
- Recipe:
 - kg wheat flour
 - ½ kg OFSP
 - ½ kg boiled OFSP
 - ½ kg OFSP flour
 - One cup vegetable oil
 - Salt.

Advanced Preparations

Obtain sufficient OFSP for each small group to have ½ kg of it. If you will be short of time, the OFSP for the boiled & mashed recipe could be pre-boiled so that the participants just mash them and then incorporate them into the recipe.

Suggested Steps

1. If equipment allows break the participants into groups of 5 people. Explain to them that they are going to prepare chapatis using a range of different recipes that incorporate sweetpotato. First each group will prepare a typical chapati using just wheat flour. Then they will make chapatis using orange-fleshed sweetpotato flour, they can decide whether to use: raw and grated OFSP; or boiled and mashed OFSP; or OFSP flour in their recipe. Ask the group what benefits there might be from using OFSP as a substitute for wheat flour in

recipes (e.g. cost, nutritional, taste, ease of access etc.)?

- The different options are written up on a flip chart so that the groups can decide which they will make. The facilitator must ensure that there is a good spread of the different recipes, and that not all groups are using OFSP, as the aim is to get them to practice and compare the different chapati recipes. If there is time, each group could test 2 or 3 of the different sweetpotato chapati recipes. Remind them that they must wash their hands before preparing or eating any food.

Wheat flour chapati	Orange-fleshed Sweetpotato Chapati Options		
	OFSP raw & grated	OFSP boiled & mashed	OFSP flour
100% wheat flour	50% raw & grated OFSP /50% wheat flour	50% boiled & mashed OFSP /50% wheat flour	30% OFSP flour/70% wheat flour
500 g wheat flour	250g grated OFSP 250g wheat flour	250g boiled & mashed OFSP 250g wheat flour	150g OFSP flour 350g wheat flour

Procedure

- First mix dry ingredients together in a bowl, then add any grated or mashed sweetpotato (depending on which recipe you are using), and mix. (500g of flour makes ~5 large chapatis).
- Add 1 tablespoon of oil and mix well.
- Add the lukewarm water little by little to the mixture in the bowl and knead till a stiff smooth paste is formed.
- Divide the dough into 5 equal sized balls.
- On a floured surface roll one ball at a time.
- Put aside for 20 minutes
- Fold each ball at a time to form a strip.
- Coil each strip to form a circle
- On a floured surface, roll out each coil into a thin circular sheet.
- Grease a shallow frying pan.
- Fry each circular sheet on both sides till golden brown, make sure both sides are greased.
- Taste.
 - Ask them to individually rank the products by preference (4=most preferred, 1=least preferred).
 - Discuss the different products: cross-compare the chapatis made with OFSP flour; raw & grated OFSP and boiled & mashed OFSP and the chapatis made from 100% wheat flour. Ask them to explain why they chose their preferred product, (probe if necessary with questions about colour, taste, texture, nutritional aspect, easiness to make, cost etc...).
 - In their small groups ask them to discuss the marketing issues associated with the different products? Quality and storage issues of these products? Any ideas for new OFSP products that they could develop? Then bring these points into a short whole group discussion.

Activity 9.2 Making Sweetpotato Juice

Objectives

Participants will know how to process sweetpotato into juice

Time

45 mins

Materials

- 4 cups of sugar;
- 8 medium sized boiled peeled sweetpotato roots;
- 3 teaspoons of citric acid OR juice from fruits like oranges or pineapples;
- 5 litres of cooled boiled water (for flavouring add tamarind, passion, pineapple or orange juice);
- Sieve;
- Pans;
- Fruit squeezer;
- Wooden spoon;
- Jug;
- 5 * 1 litre clean empty bottles;
- Fridge to chill the juice in.

Advanced Preparations

Organise cooking ingredients, equipment and facilities. Obtain sufficient OFSP. If you will be short of time the OFSP can be pre-boiled so that the participants just mash them and then incorporate them into the recipe.

Suggested Steps

1. Work in small groups, as long as you have sufficient equipment for each group to use, e.g. pans. Note the above quantities of ingredients will produce about 5 litres of juice.
2. Boil water and sugar and then leave to cool.
3. Mash boiled sweetpotato or blend, mix the product with the boiled water and then sieve/ filter.
4. Add citric acid/ lemon juice and fruit flavour if desired and mix well.
5. Pour into a jug, chill if possible and serve cold as fresh juice.

Activity 9.3 Making Sweetpotato Fiossis

Objective

Participants will know how to process sweetpotato into fiossis.

Time

45 mins

Materials

- Fridge to chill the juice in;
- 300g (2-2 ½ cups) wheat flour 50g margarine;
- 200g (1 – 1 ½ cups) sweetpotato puree 65g (¼ cup) sugar;
- 2 eggs;
- Oil for frying;
- 2 teaspoons baking powder.



Advanced Preparations

Organise cooking ingredients, equipment and facilities. Obtain sufficient OFSP, and pre-boil them so that the participants just mash them and then incorporate them into the recipe.

Suggested Steps

1. Work in small groups, as long as you have sufficient equipment for each group to use.
2. Beat the margarine and sugar together.
3. Add the eggs and then the sweetpotato puree, keep mixing.
4. Gradually add the flour and baking powder, keep mixing.
5. Knead the dough well until it stops sticking to your hands.
6. Roll small pieces of the dough into little sausage shapes and then tie each in a loose knot or bow.
7. Fry in oil (not too hot).
8. Share with the rest of the group.

Activity 10.1 Market Trip

Take a research visit to a market with half the group working on fresh root marketing margins and issues and the other half on processed products, find out about characteristics and constraints of each including any gender issues. Back at training centre groups summarise findings into a presentation followed by discussion.

Objectives

Participants will be able to:

- Understand the opportunities and challenges in sweetpotato fresh root marketing.
- Understand the opportunities and challenges in sweetpotato processed product marketing.
- Be aware of how to select an appropriate process product.

Time

4.5 hours plus travel time

Materials

- Nearby market
- Transport
- 5 measuring cups
- 5 plastic containers (~2kg root capacity)
- Notebooks and pens
- Flip charts
- Markers
- Advanced Arrangements

Organise transport, facilitator should make a pre-visit to the market to find out where the sweetpotato root traders are and whether any sweetpotato processed products are being traded, and if not to look at which processed products the participants could study.

Suggested Steps

1. Split the participants into 2 main groups and then into sub-groups of 4 persons each. Each sub-group should have one person assigned to ask the principal questions. All other participants should take notes. One group will be tasked with learning about fresh sweetpotato root marketing, and the other group about processed products.
 - **Fresh root group:** Brief the 'fresh root group' on the fact that they will be visiting the market and will have 1.5 hours to find out everything they can from small-scale and larger scale sweetpotato traders regards their activities. In the market they will probably want to work in pairs or fours, and they should write down what they learn as they will then make a presentation about it to share with the other group. This should include:
 - a) How they got into sweetpotato trading, what factors influenced their decisions?
 - b) An understanding of the different places they source sweetpotato from during the year and whether this is due to production seasonality or other factors?
 - c) When the low season and high season are, and what the traders do during the low season

E.g. Do they diversify into different products?
 - d) Their view of who the different actors in the value chain are from producers to consumers?
 - e) The typical quantities of sweetpotato that the traders sell each day and week?

- f) The size of the sack they buy, and the size of the heaps they sell?
 - g) Observe their sales 'place' and style what do you notice about it, is it clean and encouraging to customers, which section of the market is it in, how could it be improved?
 - h) Do they do any 'promotion' of their roots, if so, how?
 - i) Do they sell a range of different varieties, and why or why not? Do they sell other crops or products alongside sweetpotato?
 - j) Do they sort or grade the roots they sell in anyway, if so, in what ways?
 - k) The price that they buy a sack of sweetpotato for, what costs do they then have to pay, what sales income do they earn, what their profits are?
 - l) How they manage risks?
 - m) How their profits from sweetpotato compare to those earned for selling other crops?
 - n) Observe which type of people are selling sweetpotato, e.g. Is it only women or only men, do they also grow sweetpotato, are they typically young or middle aged, or is it a wide range? Why does it tend to be these people?
 - o) What do they know about orange-fleshed sweetpotato?
 - p) What the main problems and constraints they face are (this should include probing on quality aspects of sweetpotato roots as well as other constraints)?
 - q) What information they would like to learn related to sweetpotato trading?
 - r) Ask a few consumers what the main factors are that they use when deciding whether or not to purchase sweetpotato, and which sweetpotato roots to purchase?
- **Processed product group:** Brief the 'processed product group' on the fact that they will be visiting the market, and will need to find out everything they can from traders selling either a sweetpotato processed product (if there are any), or a product that might be able to use sweetpotato as a major ingredient, e.g. bread rolls, mandazi (doughnuts), chapati, juice, chips made with Irish potato or compete with sweetpotato products, e.g. a coconut sugar bar. The group might want to work in pairs and thus be able to cover several products. The group should carry a measuring cup, to help the product makers estimate actual amounts of ingredients used in case they can't remember. Remind them that they should write down what they learn as they will then make a presentation about it to share with the other group. This should include:
 - a) How they got into trading this product, what factors influenced their decisions?
 - b) How do they make their product, step by step, including:
 - i) The amount of each ingredient they use
 - ii) How much they pay for each ingredient and where they buy it from
 - iii) How many units do they make at a time (batch)
 - iv) Whether they hire any labour to help and what that costs
 - v) Any other expenses they may have associated with making the product
 - c) How much they sell the product for and why don't they sell it for a higher price?
 - d) How many customers do they get in a day and how long does it take to sell a batch? How many batches do they make and sell in a week?
 - e) Do they or members of the family eat a part of the batch?
 - f) What do they see as their profit margin per batch?
 - g) Observe their sales 'place' and style what do you notice about it, is it clean and encouraging to customers, which part of the market is it in, how could it be improved?
 - h) Do they do any 'promotion' of their products, if so, how?

- i) If they sell other products, how their profits from different products compare?
 - j) Observe which type of people are selling these products? E.g. Is it only women or only men, are they typically young or middle aged, or is it a wide range?
 - k) What the main problems and constraints they face are (this should include probing on quality aspects of raw ingredients as well as other constraints)?
 - l) What do they know about orange-fleshed sweetpotato?
 - m) Have they ever considered using any kind of sweetpotato as an ingredient in their product?
 - n) Ask a few of their clients what the main factors are that they use when deciding whether or not to purchase the processed product, and which processed product to purchase?
2. Travel to the market, preferably by foot if it is nearby.
 3. Visit the market, the fresh root group and the processed product group will speak with different traders about all the issues listed above as bullets.
 4. Return to the training centre.
 5. Each group makes a chart comparing what they have learned from different interviews
 6. Ask the two groups (fresh root and processed products) to each spend 45 mins discussing what they learnt and preparing a presentation (which could involve role play) about the trading activity they focused on (including gender aspects), which they will share.
 7. Presentation.
 8. *Discussion:* Following both the presentations facilitate a discussion on the trading activities observed, differences between fresh root and processed product trading and key characteristics and constraints of each (including gender aspects). Ask the participants to think about how they might involve traders in a sweetpotato project, and what opportunities they saw for improving different aspects of the value chain.

Activity 10.2 Calculating Your Profit Margin

Using a farmer case study, participants will work out the profit margins at each stage of the value chain.

Objectives

Participants will know how to calculate marketing margins for fresh root trading.

Time

45 mins

Materials

- Enough photocopies of the Case Study on Esther (Box 10.3 below) for each person to have a copy.

Suggested Steps

1. In pairs participants are given a written case study describing farmer Esther's costs of producing and marketing sweetpotato roots at each stage of the value chain. Note there are different options described. They need to work out how to present the information in a visual way that they can then use to calculate the costs and profit margins at each stage of the value chain. Highlighting any risks or opportunities they have noticed.
2. Ask each pair to join another pair, and to explain to each other their value chain calculations using the visual diagram they have prepared.
3. In a whole group discussion, ask them to discuss any difficulties they had in interpreting and presenting the case study, any differences between their understanding of the value chain and its costs and profits and that of the pair they joined with, and brilliant ideas they saw or had for presenting the information visually.

Activity 10.3 The Five Pillars of Marketing

Role play to get participants to explore marketing issues.

Objectives

Participants will understand the five pillars of marketing

Time

55 mins

Materials

- 20 orange-fleshed sweetpotato roots
- Stickers/ post-its
- Marker pens
- Flip charts
- Masking tape
- Presentation 10b on the 5 pillars of marketing

Suggested Steps

1. In order to explore their existing knowledge of the 5 pillars of marketing, organise a brainstorming followed by group discussion on the key aspects of marketing.
2. Ask for 6 volunteers to create a role play using the orange-fleshed sweetpotato roots to depict a typical market scene with people buying and selling sweetpotato roots. Give them 5 minutes to plan a 5-minute performance. The other participants will be observers.
3. At the end of the role play, ask the participants who were observing to comment on key marketing issues they saw. Note down key observations on a flip chart as the discussion continues. If necessary the facilitator should subtly probe to get the participants to mention aspects related to all the 5 pillars of marketing, and to bring out gender and diversity aspects.
4. The facilitator should then make a presentation about the 5 pillars of marketing, using questions to involve the participants and get them to share their experiences of the different pillars, and the importance of all the pillars.

Case Study: Esther's Sweetpotato Costs and Returns

Esther wanted to prepare her sweetpotato field and hired men to help (Ushs40,000), she then ploughed the field twice at a cost of Ushs30,000 per ploughing, and then hired women to help make the mounds to plant her sweetpotato on. They made 10,000 mounds, which cost a total of Ushs 200,000. Esther didn't have enough planting materials, so she went to the swamp to buy some from Josfat, she bought 10 bags of vines at a cost of Ushs15,000/ bag. She hired bicycle transport to take them to her field at a total cost of Ushs 3,000. She hired labourers to help her plant, this cost a further Ushs 30,000.

Fortunately, the rains were good, and her crops grew well, but so did the weeds, so she twice had to hire labourers to help her weed, each weeding cost her Ushs60,000. Soon it was time to harvest, the yield was good, so she hired labourers to help her harvest. They harvested a total of 60 bags of roots, and she paid the labourers Ushs1,500 per bag for the harvesting, and the empty bags cost her Ushs800/bag.

Esther was planning to sell her roots, and she knew in order to sell them she needed to grade and sort them, which cost Ushs500/bag, and package them @ Ushs1,000/bag. She couldn't decide whether to take them to the market and sell them at Ush20,000/bag or sell them from her home at Ush15,000/bag.

If she took them to the market she would incur additional costs, such as transport (@Ushs5,000/bag), loading and off-loading (@Ushs1,000/bag), market fees (@Ushs500/bag,) and agents' commission (@Ushs600/bag). She would also end up having to stay over at the market and this typically cost Ushs20,000.

Help Esther work out:

1. What her production costs per bag of sweetpotato roots are?
2. What her marketing costs per bag of sweetpotato roots if sold at home are?
3. What her marketing costs per bag of sweetpotato roots if sold at the market are?
4. What her minimum per bag selling price if sold at home should be?
5. What her minimum per bag selling price if sold at the market should be?
6. What her profit margin would be per bag of sweetpotato roots if sold at home?
7. What her profit margin would be per bag of sweetpotato roots if sold at the market?

Discuss:

- What risks she might face by selling from home, and what risks she might face selling at the market?
- What the impact of grading and sorting the roots might be? Could she bargain for a higher sales price?

Activity 11.1 Gender-Sensitivity Situations

Objectives

To be able to recognize gender sensitivity situations and to successfully solve the problem, if possible.

Time

30 minutes

Materials

- Pens
- Flip chart

Steps

1. Ask the class to name a few examples of obvious gender sensitivity that they have witnessed.
2. Write the examples on the flip chart where everyone can see them.
3. Then, ask the class to come up with solutions to the situations.

Activity 12.1 Where Did It Go?

Objectives

Participants will: practice monitoring the dissemination of planting materials; understand why we monitor and evaluate

Time

30 mins

Materials

- 200 completed (or blank if practicing using vouchers) planting material vouchers which have the information required for Form 12.3.3.1 on them
- 40 photocopies of Form 12.3.3.1
- Pens

Advanced Preparations

Collect or complete 200 completed planting material vouchers.

Suggested Steps

1. This activity could be done in several ways, if the facilitator feels it would be useful for the participants to practice completing vouchers then each group of 4 participants could spend 5 minutes completing 40 vouchers. All the vouchers can then be collected and shuffled by the facilitator, and then each group given 40 vouchers to record the details in their Monitoring of planting material dissemination form (12.3.3.1). If the participants do not need practice in completing vouchers, then the same exercise can be done using already completed vouchers.
2. Ask the groups to swap their forms and vouchers with their neighbouring group who will then check through them.
3. Facilitate a discussion about why it is important to monitor the dissemination of planting materials; what difficulties they had while completing the vouchers or the planting material dissemination tracking form; what mistakes were noticed by those checking the forms; and what improvements they could suggest.
4. Using either the forms and explanations in Section 12.3 of the manual or Presentation 12, briefly review the main reasons for using ML&E in projects and then discuss the need to monitor the performance and use of disseminated planting materials and the receipt and use of training.

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