

HarvestPlus Reaching End Users - **OSP** Uganda Project

Promoting Production, Consumption, and Marketing of the **Orange Sweet Potato**

Trainer's guide



Prossy Isubikalu, Sylvia Magezi, Charles Musoke,
Harriet Nsubuga, Sam Namanda, Anna-Marie Ball
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1.0 Background of the training guide

This training guide has been developed as a result of the need to promote adequate and effective acceptance, production, and consumption of vitamin A rich (orange) sweet potato in Uganda in order to address the widespread problem of Vitamin A deficiency (VAD). VAD largely affects children under the age of five years, along with pregnant and lactating mothers. Experiences from the two year HarvestPlus Reaching End Users Orange Sweet potato (OSP) Project in Uganda, that was implemented (2007-2009 June) under PRAPACE/ASARECA by a core implementation team in collaboration with two national NGOs – FADEP-EU and VEDCO operating in the districts of Bukedea, Kamuli and Mukono, were valuable inputs.

During the two years of project implementation in the field, training materials for each component – seed systems, nutrition and marketing / product development – were developed in full. However after during implementation there was substantial feedback from extension staff, agriculture and nutrition promoters and farmers/mothers that reflected on the need to modify the training package. As the training materials were re-visited, a downsized training package on orange sweet potato was developed where all three components were integrated and training topics prioritized. This is the revised manual.

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- *Dr Prossy Isubikalu* from Department of Agricultural Extension Education, Makerere University guided the team through deliberations of what to include and exclude, and how to harmonize the format. She also provided the expertise on the Adult Learning section.
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- Valuable feedback from the participants of all the various HarvestPlus training activities contributed greatly deal to improving this training guide.

How the guide was developed

This trainers' guide has been developed through a series of phases. The first phase was started with what the component specialists had developed during their prior training sessions (foundation material). Through a series of meetings, the foundation material was reviewed, down sized, improved and focused on critical topics related to OSP while integrating feedback and realities from the field. For easier follow up and use of this guide, each module had its objectives developed first then each objective handled separately in terms of steps expected to be followed to achieve it. In this way, it is easier for the trainer/facilitator to realistically evaluate the adequacy of the content and delivery method to the participants during the training session.

1.1 Introduction to the training guide

1.1.1 For whom the training guide is developed and how to use it more effectively

- This trainers' guide is designed mainly for organizations, trainers, and facilitators who have the interest and will to train others about production, consumption and marketing of the **orange sweet potato** in effort to minimize the Vitamin A deficiency among infants and mothers.
- Users of this guide need to be more than just familiar with the technical aspects. They need to know how to make the technical part known and useful to the community – the social skill.
- In this guide are basic steps one needs to follow when preparing as well as conducting training related production, consumption and marketing of **orange sweet potato** through facilitative processes. The basic steps provided in this guide can be modified. The modification, however, need to suit either the context or the nature of the participants and the rationale must be geared towards easing both the process and content for better understanding of the participants.
- To use this training guide more effectively, the trainer/facilitator needs to do the following: (a) provide ample time to prepare the training content and process; (b) recapitulations and linkage between/or among sessions.

Ample time to preparation of the content and process, prior to the training. Preparation in this case refers to reading¹ through the topic, objective and guiding procedure (as well as methods) to get a better understanding of what is expected. Thorough prior preparation helps the trainer to critically think through how best to handle the training so as to attain the set objectives within the realities (or context) of the participants. It also gives the facilitator chance to search for relevant information that will help him/her understand the content and process more. Success of any training will depend on the smooth flow of the content and process, which depend on how the facilitator is prepared. Facilitators' level of preparation has implications with how engaged and informed s/he is about what he is talking about, which will either keep the participants interested and engaged or keep them bored and dis-engaged.

Recapitulation and linkage between and/or among sessions for all subsequent sessions is very important. Recapping does not only help remind participants what was previously covered or done but provides an opportunity to link the previous and the present sessions. Linkage or integration of sessions is a continuous process. In as much as some participants can ably weave the thread through sessions, the way they do it may not give the desired clear picture of the parts and how they make the whole. Linkage or integration of sessions by the trainer provides more logic, a better picture and understanding to the participants. Making an adequate linkage between sessions has a bearing on the understanding of the trainer about the content, which has a link with preparation.

¹ This guide has very few reference notes. It is up to the facilitator to have creativity and interest to search for relevant information. It could be through having a talk with specialists in a given field or consulting with books or both. It is advisable to consult more than one source.

1.1.2 How the guide is organized

This training guide comprises four broad (and interdependent) sections/components:

- Section one is more of a social component that mainly talks about *Tips on How to Help Adults to Learn*, what one may refer to Adult Learning Techniques. The rationale behind including this section is to remind trainers and/or facilitators about what needs to be considered in training an adult.
- Section two focuses on the *Seed Systems*. It mainly brings out issues related to effective production of the **orange sweet potato** with quality and quantity in mind. Issues considered range from site selection and preparation, planting, to pest/disease control.
- Section three is about *Nutrition* component whose focus is mainly linked to creating awareness about the nutritive value of OSP and its importance for effective functioning of the human body so as to encourage consumption of the OSP.
- Section four is about *Marketing and Product Development* of the OSP. Focus is on how best to plan for commercial OSP production and how to promote as well as maintain the market for OSP.

Each of the sections comprises selected topics. Under each topic are general introductory remarks that give insights into what the topic is all about and its importance. This then is blended with the specific objectives or what you wish the participants to know/learn. Each of the objectives is later handled independently as a session with a set of steps or procedure that a trainer would follow to achieve the objective.

1.2 Setting the context/scene

Setting the scene is essential in creating space for free and open participation in the training activities/sessions right from the start of a training program. It helps the trainer/facilitator to prepare the groundwork and break the ice. In setting the scene, the following need to be thought through:

Setting the stage: Explain to the participants the purpose, objectives, content, flow and approach of the training/program. Explore and level participants' expectations. Make efforts to harmonize the participants' expectations with the objectives of the training. Clear all 'false' or unrealistic expectations that may create counter-productive situations.

Getting to know each other – Let participants know each other better/deeper (i.e. beyond the names) so as to promote close interaction, bonding, and collective learning. It is advisable to make introductions interactive and in form of a simple but realistic/reflective exercise. The reflections could be on participants' personalities (weaknesses and strengths), what they like most/least etc.

Setting and agreeing on group norms: Agree on some norms that will make the participants interact and support each other to promote engagement and effective/collective learning during the training sessions. The trainer could have formulated some but should make effort to make the participants come up with others in addition. It is important that participants develop, agree and own the rules as a group. Forcing rules onto the participants will create no ownership of the norms and is likely to create counter-productive situations. Neatly and visibly, write the norms on a flip sheet and place them in a place where they are seen every time there is training.

Section one

2.0 Basics about Facilitation and Adult Training Techniques

2.1 Basics about Facilitation

A trainer of adult learners is expected to guide and facilitate learning, therefore should know and use facilitation techniques/skills. In facilitation, we do not teach, we guide processes. Just like Braakman and Edwards² (2002) put it, facilitation is a conscious process of assisting/guiding a group to successfully achieve its task/objectives while functioning as a group. It is a process of enabling a group to work/learn cooperatively and effectively

2.1.1 Effective communication

Communication is very important in facilitation and hence developing basic communication skills like active listening, questioning, probing, paraphrasing, and personal feedback are critical (see Braakman and Edwards, 2002).

- **Active listening** - pay attention to what other person(s) say and/or do to get the meaning and to understand the message behind the words/actions/expressions. Neither argue nor interrupt the person talking to you. Listen to the verbal and non verbal message. Listening goes hand in hand with observing.
- **Questioning** - ask the right questions, in the right way at the right time to get the desired and intended message. Use more open-ended questions to encourage more thinking and to generate more ideas from participants. Besides, use questions to involve participants (including quiet ones), to get a feeling of participants' thoughts or what they do, and to open up a discussion that explores two sides of a given issue. Examples of open questions that one can use include: What do people here do? How do they..., why..., where..., when....?
- Linked to art of questioning is **probing**. Ask more follow up questions in order to gain more/better understanding of a given context or situation being presented by the speaker. Examples of follow-up questions include: could you please explain more? Anything else...? Keeping silent in some cases can also be used as a probing technique – it forces the person talking to speak or tell more.
- **Paraphrasing** - Re-phrase or repeat what somebody said but using your own words to make it simple enough for others to understand without altering the message or meaning. This helps to ensure the message being given is clear and understandable.
- **Personal feedback** - give someone information about the impact of his/her behavior (positive and negative) on you/others (i.e. how the behavior influences you/others). It is a way of helping a person to understand the impact of his/her behavior on others therefore chance to improve.

² Braakman, L. and Edwards, M. (2002) *The Art of Building Facilitation Capacities: A Training Manual*. RECOFTC, Bangkok

2.1.2 Other tips of playing a facilitative role

- Be attentive to what is happening at all times. Be very observant and listen
- Take adequate time to prepare both the content, flow and process design
- Continuously reflect on the process and use mistakes as learning points/opportunities
- Make efforts to capture participants' ideas on flip sheets. Use of flip charts could be seen as a laborious work but it is very important aspect in participatory training
- Have the right attitudes: have interest in the people's lives and situations, be empathetic (understand the different people's perspective on a given issue), value the uniqueness and humanity of individuals and respect their potential. Believe, trust and have confidence in the people's potential and their knowledgeable
- Your role as a facilitator is to help people bring out ideas
- Use questions that seek the current realities and NOT the ideal situation. It is from the realities being lived that gaps can be realistically identified and worked on.
- Take yourself as a learner too. The tendency of learners to look at themselves as the source of knowledge sometimes makes it difficult for learners to share their experience. What brings about such a situation and what then do we need to do to minimize such a situation? Among the things we can do include the following:
 - inform participants or your audience that you are a learner too
 - let participants know that they have lived and done a lot differently and therefore need to share with others
 - let participants know that everybody learns something when they share what they do or know. They either get something new or modify what they have for the better
 - it is clearer when a learner explains what he knows to others
 - such interactions promote freedom (informality). It means that there is need to ensure a relaxed atmosphere for learners to feel free to share their experiences.

2.1.3 Three most important things to do as a trainer

Reflecting on the field experiences with trainers promoting the OSP under the HarvestPlus-REU project in Uganda, there are three main things that need to be taken seriously if we are to create our desired impact through training. These three things include the need to make adequate preparations prior to the training, caring for the learners, and making use of the principles of adult learning.

- ***Adequate preparation:*** Trainers and facilitators need to take preparation seriously because it is very important in influencing the level of success or effectiveness of training. Create time and adequately prepare both the content and process that you intend to use prior to any training. As a trainer or facilitator, never assume that you know. Do not take training to be as simple as talking. The level of preparation has implications with the level of seriousness that learners will engage with the learning. This preparation takes into consideration (a) the clarity of what to deliver (content), (b) clarity and achievable objectives, and (c) choice of most appropriate method. There is need to think through the different available delivery or adult training methods and choose the most appropriate in relation to the objectives.
- ***Care for the learner(s):*** This covers the language used, comfort of venue and keeping the learners updated. Make effort to use the local language that most (if not all) learners in the training clearly understand. This will make the training more enjoyable and will enhance adequate or active engagement of the learners. Ensure the venue is

comfortable and clean enough to enhance learning. Keep learners informed of any programs, delays and changes - a sign of caring and valuing them.

- **Principles of adult learners:** these make the foundation for whatever we prepare to train adults about (be it planning or implementation phase). It is useful for facilitators and/or trainers to always reflect on the principles and use them as a guide.

2.1.4 Some other aspects that a trainer should keep in mind to help focus the participants

As a trainer, you need to take care of the following, to make the training smooth as well as show care for the participants or learners by guiding them to be focused:

The agenda of the day's training: think through and have the agenda that you will share with the participants before conducting the training. At the beginning of the training, introduce the prepared agenda to the participants and later give them room to modify or adjust some items. The modification, however, should be in line with the day's objective.

Related to the day's agenda is harmonization of the objectives and the participants' expectations. It is the responsibility of the trainer/facilitator to take lead in harmonizing the objectives and expectations NOT the learners. Harmonizing the two offers opportunity to level expectations and emphasizes the target/objectives of the training.

Phrasing of expectations: Help the participants to phrase their expectations right. The phrasing needs to sound like "In this training, I expect to....." Make effort to confine the expectations to the day's training and NOT the program (unless otherwise). This helps learners to focus their minds on the day's topic and make efforts to relate their expectations with the topic of the day.

Learners' opinion: Write the learner's idea, opinion, or interest then correct it later if it does not fit within the context being discussed. The tendency to write what the trainer feels is right instead of what learners say/mention is a common practice. Changing a learner's idea or opinion to read something else may not only make that learner feel judged (that he is wrong) but makes him/her feel uncomfortable. Yet in dealing with adults, there is need to ensure a relaxed atmosphere. It is okay to rephrase one's ideas as long as the original message remains. In situations where you as a trainer may not have clearly understood, seek for clarification to guide you write the true learner's message.

Language used: Use the language that participants clearly understand and as a trainer, make deliberate efforts to bring everyone on board. This will automatically include all the participants. If language used is not clear or understood by the targeted learners, the content will not be understood; hence unlikelihood of achieving the objective of the training/activity.

Need for clear and simple objective(s): there is need for clear, simple and understandable objectives to guide the learning process as well as clear articulation of the content. Think through the objectives prior to the training. Participants are more likely to be interested, enjoy, follow, understand and engage once the focus of the training is known and clear. The topic of the day should be linked or in agreement with the objectives but not reading the same. The objectives should be phrased as objectives (i.e. Specific, Measurable, Attainable, Realistic, and Time bound).

Preparedness (Command of content): Even when you have handled a given topic before, there is need to prepare because the contexts are never the same. Prepare prior to the training

to get a better understanding of the content and objective or purpose of the training and therefore how best to deliver the content. Un-preparedness or inadequate preparation creates a disconnection between the audience and the trainer, wastes time and also creates higher chances of learners losing the attention or interest in the exercise/content. Learners lose confidence in the trainer too. Besides content, help the learners understand the process and why.

Clarification of tasks: Ensure that any task given to participants is clear and well understood. Learners must understand what is expected of them in the task/exercise and how to carry on. Clarified tasks save time and help learners to focus better on the key message. Let learners know why they are going into an exercise. This stimulates active engagement in the task as well as the learning behind the task. Move around the small groups to ensure that learners understood and are on the right 'track' and that every member is involved in the group work/task.

Time allocation and management: have few items on the agenda that can sufficiently be covered in the available time. Avoid running out of time before handling the heart or focus of the training. Know the sub-sections of the training and adequately allocate the available time among the different sub-sections. Allocate sufficient or more time to the item that carries the gist of the day's training or key message.

Question asking technique: Ask to find out the reality of the learners so as to identify the true gap. Make people realize a gap with their practices (and therefore buy them into doing what we would wish to see). Encourage them to reflect on what they are actually doing and relate it to the expected. Avoid questions that point to or seek for what is taught or ideal instead because they prepare participants to mention what they see as 'right' answers but not actually what they live/do. It gives the impression that learners are being evaluated and therefore need to prove that they know the right answers to the questions raised – which is more of teacher- student environment.

Value the participants: Be courteous to the learners; update them about the prevailing changes in the process/situation. Ensure a clean and comfortable venue that does not stress the mind and body, therefore comfort to the learning process. Prior to the training, it is important for the trainer to check on the adequacy, accessibility and comfort of the venue. Let us not take learners for granted. They should know and get the feeling of being valued.

2.2 Principles of Adult learning

The people who we are training are adults – not children – and adults learn differently than children. Children absorb whatever they are taught because they don't have much life experience. Adults, however, have a lot of life experience and they are interested in how what we are teaching them matches up with what they already know from experience. For this reason we need to remind ourselves on the principles of adult learning and reflect on what we as trainers and facilitators need to do in order make our trainings relevant and to help people learn. We need to reflect on what we as trainers need to do and how best to do it, with reference to the content, context and objective in question (see table below).

Principle	Application – what is expected of the trainer
Adults have accumulated a wealth of life experience and knowledge	<ul style="list-style-type: none"> • Encourage adults to share their experience and knowledge • Use the experience as a foundation to build upon the planned content • Connect life experiences and prior learning to new information • Encourage or promote reflection (through some exercise) on the shared experiences and linkage with individual working situation on the ground. This will help the learners to best contextualize the experience
Adults are autonomous, self directed and goal oriented	<ul style="list-style-type: none"> • Involve adults in the learning process, serve more as a facilitator and not just a supplier of facts • Encourage and nurture the process of self direction. Adults can share responsibility for their own learning because they know their own needs • Give clear objectives – adults need to know why they need to learn something before undertaking it. They need to see the value. How you deliver the content should clearly show the gap between what they currently do (not well) and what is being promoted (as the right thing) • Organize programs with clearly defined elements, clearly showing how goals will be attained (for each step, get the objectives clear and for each objective get the steps of activities to attain the objective clear). Know what comes first and what comes last.

Principle	Application – what is expected of the trainer
Adults need to be respected	Acknowledge experiences that they bring, allow free voicing of opinions. Encourage mutual respect and trust among participants and their ideas
Relevancy-oriented and practical	<ul style="list-style-type: none"> • Help them see a reason for learning something and how to make it applicable in their real contexts. Adults are motivated to learn most when the content meets their immediate needs. • Before a session, explain the need and usefulness (importance) of the session to the participants. Once they are convinced of the usefulness of the session/content, the level of motivation is likely to be high • Have clear and understandable objectives of the training/session to the participants. Objectives will provide a guide into what is expected – provides some direction. This means adequate time put into prior preparation to the training and a good understanding of what the entire training is intended for
Motivated to learn by both internal and external factors	Show how learning will benefit them, create a comfort and appropriately challenging environment
Learn best when they are active participants in the learning process	Limit lecturing and provide opportunities for sharing and exercises that require participants to practice a skill or apply knowledge actively or proactively. Participation in this context is active and not passive
Not all adults learn the same way	Accommodate different learning styles by offering a variety of training techniques
Adults learn more effectively when given timely and appropriate feedback and reinforcement of learning	Provide opportunity for feedback from self, peers, and instructor. Effective learning requires corrective but supportive feedback
Adults learn better in an environment that is informal and personal	Promote group interaction, informality, relaxed and a safe atmosphere – a cheerful, relaxed person engages and learns more effectively and easily than one who is fearful, embarrassed, nervous, tired or angry person

The above hints are a guide. Exact application will entirely depend on the content and objective of the training.

2.3 What influences the motivation of adults to engage in training/learning activities?

2.3.1 What motivates adults to engage in learning or training activities?

- Social relationships – make new friends or meet members of opposite sex
- External expectations – complying with wishes/directives of somebody with authority
- Social welfare – desire/want to serve others
- Professional advancement – the pride of having a document that shows that s/he attended a training so that s/he is recognized in the community
- Escape/stimulation – getting involved as a way of alleviating boredom or escaping from home or work routine
- Cognitive interests – for the sake of learning
- Looking at the training as a source of useful information that will help solve an immediate need or problem being faced

2.3.2 What makes adults lose the interest or motivation?

- Lack of confidence – not being confident in either themselves or the trainer.
- Lack of course relevance – content not being useful in their context.
- Time constraint - having little time yet with many things to be done.
- Cost – the expense (financial and otherwise) to be incurred can be beyond the participants' affordability.
- Personal problems – problems private to the participants can hold him/her from attending the training.
- Lack of information – not being informed about the training
- Lack of voice - not being listened to or being ignored
- Self esteem – having a low or bad opinion about oneself that makes one to feel not worth

As an adult trainer, think and realistically come out with what you can actually do to use each of the issues raised, whether a motivator or otherwise, to build interest among the adult learners to actively engage in training. What do you do to use the motivating and de-motivating factors as an entry point to encourage active participation in the learning process?

2.3.3 Foundational principles of motivation

Whether confronted with motivating or de-motivating situations of the participants, the most important thing is to raise the motivation or interest of the participants in the training. The interest or motivation can be raised by observing four things (the foundation principles of motivation) when conducting the training: (a) **Inclusion** - include both the people and their ideas to enhance involvement. (b) **Attitude** - use your words and opinion, voice, body language, facial expression, and behavior to help participants like the training or to develop a positive attitude towards the training. (c) **Meaning**- let participants know and understand why the training is important (the meaning). This will sustain participants' active involvement in the entire process. (d) **Competence**: encourage and support participants to apply and practice what they get trained about. This will raise their effectiveness and hence build their confidence in using the practice.

2.4 *Adult learning methods/techniques and their application*

There are many methods that a trainer can use. This range from lecture, exchange visits, energizers/Games, simulations, case study, buzz group, brainstorming, role plays, assignment/exercise, video, field trip, exhibition, personal feedback, demonstration, experiments, slides, photography, small groups, story telling, and presentation, among others. Choice of which method to use, however, largely depends on the objective (is it cognitive based, skill based, knowledge based or a combination of the three). How well a method will be used also calls for adequate preparation on how to link the content and the chosen method of delivery. Below is a range of commonly used training methods and when they are applied.

Table: Most commonly used training methods

Training Method	Purpose or when applied
Presentation	Introducing new ideas, topics, concepts or procedure Useful when the audience is big and when the available time is limited, interspaced with discussions, questions and answers
Lecture	<ul style="list-style-type: none"> • Most commonly used instructional strategy • It's a formal talk usually without interruption from the listeners. Some times it is followed by questions, answers and discussion. Can be interactive depending on trainer • Ideas to make it effective as a strategy: be organized - plan ahead & be logical; allow for periodic breaks to minimize sitting and listening for a long time; use visuals; allow for discussion; think of less formal seating arrangement
Brainstorming	<ul style="list-style-type: none"> • Used to capture a wide range of ideas about some issue. • Encourages creative thinking and free sharing of ideas, experiences • All ideas are accepted and recorded with no discussion/response regardless of usefulness or practicality • Leads to a comprehensive list upon which the learners may reflect and/or pick a discussion there after. Discussion can include development of spin off ideas, refining of ideas, combining and/or reinforcing ideas • A fixed time is allocated to the process
Personal feedback	<ul style="list-style-type: none"> • Personal feedback gives information about behavior and performance. • It is a way of helping a person identify his/her 'blind spots' and understand the impact of their behavior on others. • Personal feedback helps people improve on their performance • Feedback from others during the training helps you to become aware of your strengths and weaknesses as a facilitator
Small group discussions	Sharing experience, exchange ideas and opinions, problem solving, controversial issues, planning

Training method	Purpose or when applied
Buzz groups	<ul style="list-style-type: none"> • A buzz group is a small group (2-3 people) that discusses a specific topic/issue for a short period of time. Number of people in a buzz group depends on entire group size and the task/assignment • Useful during longer plenary sessions and helps in: <ul style="list-style-type: none"> ○ Digesting or understanding of the content ○ Exchange or sharing of ideas & opinions ○ Reflecting on what has been learnt, how to use it ○ Drawing on experience and linking it with the discussion • As a trainer; use of buzz groups allow you to: energize people, assess participants engagement, experiences and understanding with reference to the content and to encourage shy people in a non-threatening way <p>Note: (a) invite people to report back, (b) process the output – summarize, analyze. In other words people should see the applicability or implication of the discussion</p>
Experimentation	<p>Experimentation looks at building capacity for self-learning through structured process of trials, reflection and analysis. When we experiment, we are looking for some information e.g. what works? What makes it work?</p>
Demonstration	<ul style="list-style-type: none"> • Demonstration looks at sharing certain procedure and learning technical skills • It is most effective when learners are concerned with an issue and are looking for an answer • Demonstration aids understanding and retention; require lengthy preparation <p><i>Result demo = shows result of some procedure through evidence that can be seen, heard, or felt</i></p> <p><i>Method demo = illustrates how to do something in a stepwise fashion</i></p>
Role play	<ul style="list-style-type: none"> • Learners assume roles within a simulated situation then deal with that situation • In role plays hypothetical roles may be assumed within artificial situations • In simulations, attempt is to stimulate certain situations that learners will actually have to deal with when they go out to the field, can serve as energizers in a way • The exercise must be followed up by a detailed debriefing in which participants are encouraged to analyze the experience and draw out lessons. Give them chance to talk about how they feel, what they observed, what they learnt and implications in doing their work in future. This is what we call processing the exercise
Energizers/games	<ul style="list-style-type: none"> • These are exercises (games, songs, filling puzzles) used mainly to enliven sleepy or bored members • Useful in: encouraging interaction, knowing each other, stimulating creative thinking or mind cracking, challenging basic assumptions, illustrating new concepts, team building and fun • Useful in internalizing content especially when linked to content

Section two

3.0 Orange Sweet Potato Seed Systems

3.1 Background

The goal of Reaching End-User Vitamin A Sweet potato project is to improve the livelihood of rural livelihoods through boosting production and consumption of Vitamin A rich orange sweet potato (OSP). Promoting consumption begins with having adequate production both in quality and quantity. This section focuses more on guiding the sweet potato farming communities, through trainers, on how best to enhance production and productivity of the orange sweet potato. The broad objective under the seed systems component is to promote feasible and more sustainable strategies that result in increased returns from sweet potato enterprise through improved agronomic practices. These practices range from access and availability of clean planting material to harvesting.

Specifically, this section of the trainers' guide aims at providing adequate guidance to trainers on how best to improve production of OSP. Improved or increased production has a bearing on increased consumption and distribution of OSP among the communities. This eventually stimulates demand for the OSP.

It is important to note that sweet potato is a versatile and adaptable crop, ranking among the most important food crops in the world. Asia is the world's largest sweet potato producer, followed by Africa. In Africa, Uganda is the lead producer of sweet potatoes. In spite of the second position in producing sweet potato in the world, sweet potato yields in Africa are quite low mainly due to inadequate agronomic or crop management practices. Improving the agronomic practices provides adequate potential to step up the production and yields of sweet potato in Uganda and Africa. Sweet potato is known to be a life saving crop especially in moments of famine – it is a reliable food security crop. It can grow in any soil and is consumed almost in all communities.

So why should we promote the *orange sweet potato* instead of other white and cream sweet potatoes? The reason is because OSP contains vitamin A – while the others do not. Vitamin A deficiency is one of the biggest problems facing mothers and young children in Africa – including Uganda. Vitamin A, which is found in both animal and vegetable sources, is limited because of expense and seasonality. Animal products (eggs, liver, dairy products) offer one of the main sources of vitamin A but these are expensive and cannot be afforded by the majority. Fruits and vegetables are seasonal and most people don't know which vegetables to eat. The OSP is a rich vitamin A food that can easily be grown, accessed and consumed. Nutritionally, it is rich in carbohydrates and vitamin A so it offers people a chance to eat a food that is tasty and which minimizes their chance of vitamin A deficiency (VAD).

Topic 1: The position of Orange Sweet Potato in the overall sweet potato production system

Introduction

Sweet potato is one of the important food and cash crops, cultivated and consumed by all communities across the world. Traditionally, in Uganda, it has been mainly grown in the Eastern region. With the numerous changes in accessing food, weather, and others, many households have integrated sweet potato in their farming and feeding system. Vitamin A rich sweet potato has been distributed to a number of communities in different ways and through different agents. HarvestPlus is interested for farming communities to integrate OSP in their farming and feeding system. Insights about the status or position of sweet potato, whether as a food or cash crop, in a given community will give some hints about the likely status/position of OSP. This makes the trainers think through more feasible ways of how best to create awareness and encourage the communities to take up OSP.

Objectives

By the end of the training on this topic, participants should be able to:

1. analyze the potential of sweet potato especially OSP as a food and cash crop in the their local context,
2. know/tell the importance of vitamin A rich OSP and positioning of OSP in their sweet-potato production system.

Materials needed: Flip charts, Markers, masking tape,

Average time: 1 hour and 30 minutes

Note: *Each objective will be handled as a session on its own and will therefore have specific steps to be used. The sessions will be numbered continuously as they follow each other.*

Session one

Objective one: *To analyze the position and potential of sweet potato as a food and cash crop in the local context*

Procedure/steps to guide this session

- Introduce the topic of this session, why it is important and objective of the sub-session to the participants.
- Explore the status or position and uses of sweet potatoes in the area (as compared to other crops). Let the participants rank the crops according to importance in the area. Use the ranking generated to discuss the importance of sweet potatoes in the area as a food crop and cash crop. Let this be a group exercise of 2-3 groups.
- Maintain the 2-3 groups formed, let each groups discuss the current situation of sweet potatoes in general in their area. Focus is on level of production (acreage and quantities) and factors influencing production of sweet potatoes in their area.
- Let the groups present their outputs and allow time for discussion about each output to point out similarities and differences.

- Make a brief presentation on content (the situation at the national level in terms of average yields, status, agronomic practices and uses of sweet potatoes).
- Allow open discussion for the participants to internalize the content.
- Explore what the participants have as the key message in relation to the content of the sub-session. Invite 2-3 people to give what they see as the key message. Reinforce this with the already prepared take home message “ *Grow orange sweet potato for both home consumption and for the market*”

Session two

Objective two: Knowing/telling the importance of Vitamin A rich OSP and positioning of OSP in their sweet potato production system

Procedure/Steps to guide this session

- Introduce the topic of this session (e.g. importance of Vitamin A and status of OSP in the local context), why it is important and objective of this sub-session to the participants. The trainer can as well explore the expectations of the participants related to the topic and harmonize them with the target or intended objective(s).
- Explore what the participants know about OSP. Preferably use an open ended question and allow a brief discussion among the participants about OSP.
- Explore the position of OSP in the sweet potato production system in the area. Divide the participants into 2-3 groups. Let each group come up with a list of sweet potato varieties in the area, then rank the varieties. Here seek to find out whether OSP is grown in the area and the importance attached.
- Make a brief presentation about the content (uniqueness, importance of OSP and the use of vitamin A in the human body) that you as a trainer had prepared about the topic. This serves as the starting point to buy in the farming community to accept and take up the OSP varieties in the farming systems.
- Allow an open discussion for comments and clarification following the presentation as well as creating opportunity for the participants to integrate the presented content and what they formerly knew about OSP. Agree on how to integrate and/or expand production of OSP in their context.
- Explore the key message that the participants have got from the session then reinforce this with the already prepared take message “*Orange sweet potato is an important source of Vitamin A for the family*”

Topic 2: Development of an area-specific sweet potato production annual calendar

Introductory remarks

This topic is about developing a sequence of activities that farmers in a given area engage in when growing sweet potato. Knowing all sweet potato related farming activities and their order of occurrence during a year provides room for trainers and farmers identifying more feasible time/space about when to introduce OSP related activities. Introducing OSP related activities following the chronology of the sweet potato crop and its annual calendar does two things. One, it makes trainer and farmer to plan collectively, which makes it easier for farmers to integrate the (introduced/new) activities into their normal/traditional work schedules. Secondly, it offers realistic moments for practical sessions to ease understanding. Generally the exercise helps the trainer to come up with a realistic work plan related to introduction of OSP related activities. Involving the farmers/participants in developing the work plan right from the beginning has higher chances of promoting local ownership and active involvement in the program.

Objective

At the end of the session the participants will be able to develop an annual sweet potato production calendar in the area that will serve as a basic guide in fitting or integrating OSP in the local context

Materials needed: Flip charts, markers, masking tape

Average time: 2 hours

Session three

Objective: Development of an annual sweet potato production calendar to guide integration of OSP in the local farming system

Procedure/ steps to guide this session

- Introduce the topic of this session, why it is important and objective of this sub-session to the participants. Make linkage of the current topic/session with the previous topic/session.
- Through a brief brain storming session, find out what activities are carried out in producing sweet potatoes in the area. List them as they come out or as they get mentioned. This exercise will serve as a starting point of engaging the participants with the content of the day. Contradictions will definitely come out and this will be the entry point of the next step.
- Divide the participants into 3-4 sub-groups taking into consideration gender balance within the groups. Let each sub-group discuss activities conducted in their area in relation to production, consumption and marketing. Each group should come up with a representative annual sweet potato calendar showing activity and the period or time (by months) when the identified activity is conducted in the area.
- Let each of the sub-groups present their outputs in plenary. In the process, it is advisable for the facilitator/trainer to take note of the similarities and areas of contradiction that will come up from the different groups. After each sub-groups presentation, allow a brief

plenary discussion. After all have presented, invite a general discussion about the activity calendars presented.

- In plenary, and taking into consideration the different sub-group outputs (it is advised that each output remains pinned up so that the participants can quickly refer to them) guide the participants to collectively come up with one comprehensive sweet potato activity calendar of the area. The developed comprehensive sweet potato activity calendar will serve as the reference point in making decisions on the best period to introduce and bring in training about the new OSP varieties in the area.
- Based on the comprehensive sweet potato activity calendar developed for the area, let the participants/participants develop tentative but feasible schedule for introducing the OSP in the area as well as training sessions on OSP. This will be in plenary under the guidance of the trainer.
- Wrap up the session with this message: *“Make work-plans for implementing OSP activities based on the sweet potato production schedule for the area”*

Topic 3: Pre-planting and Planting Activities in sweet potato

Introductory remarks

Pre-planting activities are taken lightly yet they have a great influence on the ultimate yields. It is important to bring this to the attention of farmers so that they minimize yield losses related to pre-planting related activities. Among the most important pre-planting activities that will be focused on in this topic include timely planting and quality of sweet potato vines. . Farmers tend to plant sweet potato after planting other crops. Two reasons are attributed to this. In some cases the vines are not available and farmers take their time planting other crops as they wait for the rains to stimulate sprouting, growth and maturity of the few vines around. Some farmers deliberately plant late with the reasoning that the varieties they plant mature early and therefore no need to rush. It is important to know that sweet potato require adequate moisture at rooting stage or else the yields are reduced significantly.

Related to timely planting is the availability of planting material of the right quality (clean) and in adequate quantities. This calls for vine conservation efforts. Clean vines can increase yields up to 35%. Diseased and pest infested vines cause early attack and more severe damage to the crop hence minimizing the yields. Factors such as age of vines and mixed varieties have significant implications on plant vigor and yield. Similarly, planting methods affect final yield. There are several methods of planting sweet potato dependent on ease of planting, purpose of the crop, availability of vine and weather conditions. There is need to get a common understanding of why different approaches are used before the recommended practice is introduced and evaluated. Under planting activities, mound style/size, placement, number of vines, and depth of planting the vine will be explored in relation to yield and size of tuber. The advantages and disadvantages of the methods used will be explored so that the participants make informed decisions.

Objectives

As a result of exposing participants to this topic, participants should be able to:

1. analyze and understand the importance of timely field preparations and their effect on final yield
2. analyze local vine conservation options for effectiveness in quantity and quality of vines produced for scaling up in the local context and explore issues to do with OSP vine quality in relationship with the different sources
3. analyze the importance of timely planting and its effect on the ultimate OSP yields
4. analyze the different sweet potato planting methods used in the area and their implication on yield.

Materials needed: Land, hand hoe, Flip charts, assorted markers, and masking tape, sweet potato or OSP vines

Average time: 1 hour and 30 minutes

Session four

Objective 1: Analyzing the importance of timely field preparations and their effect on final yield

Procedure/Steps to guide this session

- Introduce the topic of the session, why it is important and objective of this session to the participants while linking with the previous topic and session.
- Use brainstorming method to explore criteria or parameters that the farmers base on to select sites where to cultivate sweet potatoes. From the generated list, choose about 3-4 main criteria used.
- In sub-groups of 3-4, let the farmers analyze each of the 3-4 main criteria in terms of influence on yields. For effective time use, let each sub-group work on one criterion. Recommend that each group makes effort to visualize their outputs on flip charts so that every person can see and follow. Allow each of the sub-groups to present their outputs to all the rest of the participants in plenary. After each presentation, allow some discussion and contributions (including experience sharing) from plenary. It is advisable for the facilitator to keep noting the contributions for each group on the respective flip charts.
- After the plenary has made contributions to each of the 3-4 sub-groups' outputs, make a wrap up that mainly focuses on the analyses made (about criteria used to select sites) and the implications of the site selection criteria on OSP yield.
- End with a take home message, ***“Prepare and plant your fields in time, in order to get better yields”***

Reference notes: Sweet potato site selection and preparation

- 1) Locating new sweet potato fields next to old ones increases pest/disease cross infection. Sweet potato requires well drained, easy to work soils. Sandy loams give the best yields. Use of crop rotation contributes to improved yields. In a proper crop rotation, sweet potato can follow cereals and legumes but should never follow root crops (cassava, yams) or tuber crops (*Solanum* potato). Root and tuber crops have almost similar nutrient requirements and tend to suffer from the same pests/diseases.
- 2) Land preparation is important because top soil is turned, plant residues are incorporated into the soil, and aeration is improved. Prepare the field well in advance (at least 2 weeks) before planting sweet potato, to allow enough time for plant residues to rot and release nutrients (food for crops/plants) into the soil. It also buries (annual) weeds thus minimizes weed establishment in the field. Soils become workable, a situation that is essential for growth and expansion of the storage roots, hence higher yields. Dig diversion waterways and plough along the contours to minimize soil wash off.
- 3) To avoid planted vines from desiccation, monitor the weather and plant when rains are expected. Late planted sweet potato suffers from moisture stress and pest/disease attack during critical stages and often results into low/reduced root yield.
- 4) Planting different varieties in different plots helps the farmer to realistically see the difference in performance and therefore decision of what to do with what variety

Session five

Objective 2: Analysis of local vine conservation options for quantity and quality of vines produced for scaling up in the local context

Procedure/Steps to guide this session

- Introduce the topic of this session, its importance to the participants with linkage to the previous topic/sessions.
- With an open question, find out the different local vine conservation methods that the participants use in the area. Take note of the different options and rationale given.
- For each local vine conservation option, let the participants, in sub-groups, discuss (based on their experience and what they think) and come up with (a) the advantages and disadvantages of using that option, (b) the quality and quantity of vines produced.
- Let each of the sub-groups present their outputs to plenary and invite contributions from plenary after each presentation for the benefit of every participant.
- In well guided plenary session, find out from the participants (with the help of a well thought through open ended question) what they see as the most feasible vine conservation option that would provide adequate quality and quantity of sweet potato, hence OSP vines for more people in their area.
- Hold discussion on issues of quality in relationship with the different vine sources.
- Explore participants understanding, perception or view of (good) quality vines. Rationale here is to find out what participants refer to as good quality vines and the criteria they use in identifying good quality vines.
- To get a clearer picture of the participants' perception of good quality vines, request for about 4-5 volunteers to move to nearby sweet potato fields and cut 4-5 vines. Let each of the volunteers present his/her cut vines to the plenary while explaining why they practically chose those vines then allow some reactions from the plenary. The objective behind this exercise is to see clearly what parameters are used in deciding about quality and the actual way vines are cut in the area. At this point, it is important that the trainer keeps noting any contradictory points or points very likely to keep participants in the loop of poor quality vines. In case the training sites are likely to be far from a sweet potato

field, it is advisable for the trainer to move with some bundles of (OSP) vines having different quality related attributes (e.g. infected with a pest or disease, old, tender, mixed varieties, etc.).

- Make a brief presentation with emphasis on the important aspects that we need to take note of in quality vines.
- Make a brief presentation on the improved/new ways of conserving sweet potato vines and their effect on quantity and quality of vines. For effective engagement and understanding of the participants, conduct a demonstration on the new/improved vine conservation method.
- Invite an open discussion to get a ‘pinch’ of what the participants think in relation to their most feasible local vine conservation method and the improved/new method.
- Wrap up the session and end with key messages
 - ***“Set aside a piece of land or part of the garden to use for producing quality vines - using new vine production techniques”***
 - ***“Select and plant good quality vines so you get better OSP yields”***

Some reference notes on quality of OSP vines

Select planting material from a clean, healthy, vigorous-looking crop. Vines from 2-3 months old OSP crop produce a more vigorous crop and better yield as compared to vines from a 4–6 months old OSP crop. This is because as the crop matures, nutrients are channeled to the enlarging storage roots. The top 30cm length of the vine makes the best planting material as compared to vines cut from other parts because the tip easily recovers from cutting and planting “shock” and grows faster than the lower parts of the vine. The tip is more likely to be free from sweet potato weevil and stem borer eggs. The middle parts of the vine may also be used if there is a shortage of planting material. The basal (lower) part of the vine is often affected by pests and tends to harbor eggs, larvae or adult weevils inside.

Select vines from a healthy looking OSP crop. Ensure that the selected vines are free from pest and disease infestation. Check for any pests in any form/stage (eggs, larvae and adult), presence of any disease (dark spots on the foliage, folded, curled or shriveled leaves). The OSP vine should be fresh and of desired vine length (20–30cm). The cut vines need to be planted 2-3 after cutting to avoid deterioration in quality, hence need for readily prepared field prior to cutting the vines. In situations where farmers are unable to plant 2-3 days after cutting, due to some unavoidable circumstances, the cuttings can be stored in a cool and shady place for a maximum of 7 days. Storing vine cuttings prior to planting hardens them, (they become tougher and more resistant to the “shock” of planting). Note that as days become more (than 3), the quality of the vine continuously lowers. This consequently reduces yields. To improve the quality of the vine that is likely to be stored longer than 2-3 days after cutting, remove most of the leaves from the stem and leave only a few leaves at the tip. This helps to preserve the food reserves in the stem. Tie the vines in small bundles and cover their bases with a wet cloth or sack to minimize loss of moisture. Vines under storage may develop roots at the base (i.e. pre-sprout). Although there is no yield advantage, pre-sprouted vines establish faster.

Session six

Objective 3: Analysis and appreciation of the importance of timely planting and its effects on ultimate OSP yields

Procedure/ steps to guide this session

- Introduce the topic of the session and its importance while linking it to the previous session/topic.
- In a guided plenary session, find out from the participants/participants when they actually plant sweet potatoes in their area and the rationale/reasoning behind the given time. Note the different planting times on a flip chart.
- Let the participants, in subgroups, discuss what they have realized (from experience) as the advantages and disadvantages of the different planting times in relation to the ultimate yields. It is advisable that each sub-group discusses one planting time, then present their outputs in plenary. Invite contributions from plenary following each presentation.
- Make a brief presentation to reinforce and emphasize the most appropriate time to plant sweet potatoes and its effect on the ultimate yield.
- Invite a more general discussion seeking for what participants see as the implications of the topic or session in their sweet potato farming practices/system and hence planting of OSP.
- Wrap up the session with *key message*, “*Plant on time to get the maximum output of OSP*”

Session seven

Objective 4: analyzing sweet potato planting methods in the area and choosing the most effective method that gives better OSP yields

Procedure/Steps to guide this session

- Introduce the topic of the session and why the topic/content is important to the participants.
- Through an open ended question, find out what sweet potato planting methods are used. Keep probing to ensure the following parameters come out: soil heaping methods/style and size of soil heap, number and placement of vines, and depth of vine planted into the heap.
- To make the session more practical, request for 3-4 volunteers who will demonstrate what each actually does and rationale under each parameter while others observe. Each of the four will demonstrate at a time while explaining why s/he does like that. Keenly listen and observe while taking note of potential strong points and gaps or disadvantages of what is locally done in relation to yield. Make efforts to find out if there is any other related method that is used but not reflected in what has been demonstrated by the trainees.
- Let the participants discuss and analyze the planting methods in terms of (a) advantages and disadvantages, and (b) size of tuber and ultimate yields.
- Follow up one parameter at a time for easy understanding and engagement of the participants. For example you may start with soil heaping, heap size, number of vines, vine placement (angle), and end with depth of vine pushed. Repeat bullets 3 and 4 above for each parameter or planting method to be handled.

- Make a brief presentation on the most appropriate planting method (heaping style and space between heaps, size of heap, vine placement (angle), and depth of vine pushed. In relation to improved sweet potato yields.
- Through a brief general discussion, explore participants opinion and view about what they take as the most effective planting method that is likely to provide better yields, integrating what they do and what is presented by the trainer.
- Wrap up with a key message, ***“Choose the planting method that produces more yields – right heap size, vine length, correct placement of vines”***

Reference notes: Sweet potato/OSP planting activities

Methods of planting: Sweet potato is grown in mounds and ridges of varying sizes, but rarely on the flat. The mound type of seedbed is the most common. Ridges are commonly used in hilly or sloping areas to control soil erosion. Recommended mound size is 100 cm (3 ft) wide and 60 cm (2 ft) high; recommended distance between mounds should be 1 m (3 ft). Ridges should also be 100 cm (3 ft) apart and 60 cm (2 ft) wide. Although the difference in yield between ridge and mound seedbed is not significant/small, research shows that ridges give much higher returns than mounds because making ridges requires less labor. Making ridges is more possible with oxen and tractor as opposed to heaping mounds. Mounds are better in flat areas that are infested with mole root rats.

Planting time, methods and plant population: Late planting exposes the crop to drought and weevil infestation/damage, hence reduced yields and quality of storage roots especially during dry spells.

Vine population and placement: Planting three vines per mound spread singly on the sides of each hill about 1 x 1 m (making a triangular form when viewed from above) results into better yields than lumping all the vines in one position as is often the practice in some parts of the country. If planting is on ridges, single vine cuttings spaced 30 cm (1 ft) apart, are planted in one row along the ridge top. When planting, push about two thirds of the vine into the mound/ridge. This depth is adequate enough for the crop to establish itself well. With the recommended spacing of vines in either mound or ridge planting method, the plant population becomes 13,500 cuttings per acre (about 33,300 cuttings/vines per hectare)

Weeding: Weeds compete with the main crop for nutrients, light, water and growing space. They often provide refuge for insect pests. A weed free field, especially before the vine canopy covers the soil, leads to improved yields. Weeding of OSP fields is done twice: at 3 weeks after planting and then 3 weeks later (6 weeks after planting). If herbicides are affordable, it is advisable to make the mounds/ridges then spray the herbicide 2–3 weeks prior to planting to smother any weeds that may emerge before planting.

Topic 4: OSP crop protection (pests and diseases)

Introduction

Pests and diseases are very important because of their effects on the quality and quantity (yields) of OSP, hence consumption and marketability of the OSP. Different pests and diseases attack different parts of the OSP crop and cause different forms of damage. For the different pests and/or diseases, there are specific control measures. Pests/diseases are the major limiting factor in successful production of OSP and sweet potato in general. Often, farmers fail to differentiate between pests and diseases, a situation that tends to lead to wrong control measures/strategies, which increases the cost of OSP production. In order to minimize losses due to pests/diseases, it is important to introduce farmers to the different pests/diseases, their damage, and how best to control or manage them. In this case, integrated crop management is viewed as the most effective and promising strategy of controlling the pest/disease complex in OSP. Effective control implies correct identification of a given pest

or disease and therefore correct measure. Although pests and diseases are related, the two will be handled as separate subtopics so as to make participants follow and understand the content better. The broad objective in this section is to make sure that the participants are able to differentiate pests and diseases as well as choose the most appropriate control method.

Crop protection (I): Pest control sub-topic

Objectives

At the end of the session participants will be able:

- 1) identify the different pests affecting sweet potato/OSP production in their area
- 2) analyze the one pest control methods used in the area so as to choose the most appropriate methods

Materials needed: Flip charts, markers, masking tape, samples of damaged OSP/sweet potato vines, samples of pests, and samples of pest damaged roots

Average time: 3 hours and 30 minutes

Session eight

Objective 1: identifying the different pests affecting sweet potato production

Procedure/Steps to guide this session

- Introduce the topic of this session, objective(s) and importance of the topic/content about pests.
- Use a brief brainstorming session to open up a discussion about what participants have experienced with pests and to get insights into what they take to be key pests.
- Divide the participants into 2-4 sub-groups. Let each subgroup discuss and then: (a) come up with a list of pests that attack sweet potato/OSP; (b) make effort to describe the physical appearance of each of the pests listed; and (c) the damage the pest causes on the sweet potato/OSP. Recommend that each group writes its outputs on a flip sheet. The rationale behind this exercise is to find out the extent to which participants know and understand sweet potato pests and whether they can actually differentiate pest from disease.
- Let each of the sub-groups present their outputs to the plenary. Allow few questions, comments, additions and points of clarification after each presentation. As each group presents, take note of common issues as well as contradicting issues that (may) emerge. Seek clarification especially in contradicting issues after all have presented. The rationale behind this exercise is to come up with one collective comprehensive list of pests known in the area, a common description of their appearance and damage caused.
- Make a brief presentation of the content you (the trainer) had already prepared. Reinforce the presentation with visual aids or specimen (pest and damaged sweet potato/OSP samples) that show the different sweet potato/OSP pests and type of damage caused. If there is a nearby sweet potato/OSP field, with guidance from the trainer, let the participants go there to identify the pests and damages they cause.
- Invite a general discussion about what they (the participants) generated/knew and what you (the trainer) presented. Do they see any difference? The discussion at this point will help the participants realize the gap, if any, between what they knew and the reality. Guide them (with reference to the notes you made during the presentations to plenary) to recognize the gap and think of how best to correct it. Encourage them to make individual

reflections on what they have learnt or got a better understanding about. They can share their reflections in buzz groups.

- Wrap up the session with a key message, ***“Correctly identify OSP pests and the damage they cause in order to use the most appropriate control method – to reduce costs”***

Session nine

Objective 2: analyzing the OSP/sweet potato pest control methods used

Procedure/steps to guide this session

- Introduce the session (objective and importance of the session). Make a link to show how related and integrated the current session (ten) is to the previous session(s).
- Through a brief brain storming session, solicit from the participants the reasons why they control pests and few pest control measures/methods used.
- Divide the participants into 3-4 subgroups. Refer to the previously generated list of OSP/sweet potato pests (from session above) and assign each subgroup different (but equal number of) pests to look at. All group work should be captured on flip charts.
- Let each sub-group discuss and come up with how each of the pests assigned to it are traditionally controlled. Request the participants to separate what they have actually used/tried out, what they have seen others use and what they have heard about.
- Allow each subgroup to present their outputs to plenary. Invite a brief discussion following each of the presentations to allow clarifications, additions, and corrections especially from non-group members. The rationale here is to get a comprehensive inventory of the different control methods that participants use against each specific OSP/sweet potato pest.
- For each of the OSP pest control methods, let the participants (preferably in buzz groups), share their experience about how the methods were effective as well as what they find/found to be the advantages and disadvantages of the pest control methods. It is advisable for the trainer to capture the experiences on flip sheet/chart. The practice of capturing ideas on a flip allows synthesis and captures attention of the participants on one point being discussed at a time.
- Make a presentation about the content you had prepared about sweet potato/OSP pest control methods.
- Allow a general discussion. In the process of the discussion, let the participants integrate what they have been doing with what the trainer has presented and use this as a guide in deciding the most appropriate and effective way of controlling OSP/sweet potato pests
- Wrap up the session with a key message. ***“Use both cultural and recommended pest control methods to produce better quality OSP”***

Some reference notes for session on pest control

The concept of integrated pest management: The concept of integrated pest management (IPM) refers to applying a combination of control approaches used to reduce pest or disease damage to tolerable levels and not aiming at complete elimination. The techniques include use of cultural farm practices such as proper agronomic practices, planting tolerant varieties, environmental modifications and appropriate or minimal chemical pesticides. The choice of control components depends on the key pest or disease to control, which part of the plant is attacked, the kind of loss caused and control measures available. Infestation by pest is a major limiting factor in successful production of sweet potato and integrated crop management techniques are not only effective but also economical in disease control.

Some common OSP/sweet potato pests and how to control them

Butterflies: the most destructive stage of the butterfly is the larvae form, which mainly destroys the leaves through feeding and webbing. This pest is more common and serious at the beginning of the rainy season. The adult butterfly lays numerous eggs on sweet potato leaves. As control measures, do the following: destroy the eggs to stop hatching, pick clean vines with no traces of butterfly/pest eggs on the leaves, intercrop OSP with onions to repel butterflies and therefore minimize chances/number of eggs laid in the OSP field, hand pick the larvae from the leaves and destroy their webbed nests, plant early to help the crop escape attack especially at critical development stages, in extreme cases use a contact pesticide (this may be more applicable in situations of commercial vine production)



Sweet potato weevil: the larvae and adult stages of the sweet potato weevil are both destructive. This pest is destructive to the whole sweet potato crop i.e. the leaves, stems and roots. The adult lays eggs in the stem (at the base) which hatch into larvae that burrow down the roots. The larvae destroy the



roots as they feed. Adults too create brown spots or perforations in the root. Infestation of the sweet potato weevil is most during dry periods. Damage caused by this pest considerably reduces the yields and quality of the sweet potato. Marketability and edibility are lowered. The control measures include: early planting and harvesting, use clean and pest free vines (top most part), practice crop rotation, avoid volunteer crops, hill up cracked mounds/ridges to minimize entry of the pest, sprinkle local herbs (tea solution) on infested crop. Because the sweet potato weevil spends most of its time under the soil and leaves, chemical control is neither effective nor appropriate.



Rodents: this mainly includes mole rat and the common rat. These feed on the storage roots and actually spoil more roots than they eat. Signs of their presence in a sweet potato field include small mounds of freshly dug soil, vines pulled down into the soil, holes in the mounds/ridges. To minimize rodent infestation and damage: destroy the burrows, keep the field surrounding clean from vegetation and rubbish to reduce rodent population, dig a deep ditch around the perimeter of the field to prevent rodents from digging tunnels into the field, smoking a mixture of pepper and dry cow dung, plant repellents like the deep-rooted poisonous *tephrosia vogelii* in the field, pour a mixture of hot water and pepper into the hole/barrow (this is reported to kill the rodent), use traps, etc. Two important things to note: one, rodent control is more effective when done collectively, not individual's efforts; and two, use of poison is not recommended given that any poison that may kill rodents is equally as harmful to human beings and other domestic animals.



Other pests

Army worm: feeds on the leaves and creates large holes in the leaves. In effort to control the army worm: keep the field weed free, destroy eggs and larvae, lay light traps over basins of water to trap adult moths (they are nocturnal). Biological enemies (predators) like spiders and wasps can be used to destroy or feed on the larvae



Crop protection (II): Disease control sub-topic

Introduction

Diseases, just like pests, cause severe yield losses to sweet potato and other crops. Diseases are caused by minute organisms that cannot be seen by the naked eye but are spread by insects/pests in the process of feeding. What we are able to see is the damage or effect of the disease. Often, because of the effects observed, there is a tendency to mistake disease damage with pest damage. This does not only lead to wrong control measures but increases the cost of production unnecessarily.

Objectives

At the end of the session the participants should be able to:

- 1) identify common sweet potato/OSP diseases/disease symptoms so as to differentiate sweet potato pests and diseases
- 2) identify most appropriate control options for the different OSP/sweet potato diseases that fit their local contexts

Materials needed: Flip charts, Markers, masking tape, samples of disease damaged vines, and samples of disease damaged roots

Average time: 3 hours

Session ten

Objective 1: identifying common OSP/sweet potato diseases

Procedure/steps to guide this session

- Introduce the topic of this session, objective(s) and importance of the topic/content about diseases. Mention the two objectives and let participants know that you will handle one objective at a time starting with the first objective of the sub-section (disease control). Remember to show the link between the previous sessions.
- Use a brief brainstorming session to find out the common sweet potato/OSP diseases known to the participants (you will use an appropriate open ended question). Write the diseases on a flip chart/sheet as participants mention them out. Let the participants clearly describe symptoms/appearance of the mentioned diseases, especially given that disease names are very limited in local languages. This exercise helps you the trainer to get insights into the sweet potato diseases known and whether the participants can differentiate between pest and diseases.
- Make a presentation of the content of the session on common sweet potato/OSP diseases then later open up a brief plenary discussion about sweet potato diseases in the area. This presentation serves to help the participants recognize possible mistakes they could have made in confusing pest and disease attack/damage, hence correcting this tendency. Reinforce the presentation with visual aids or specimen (diseased sweet potato/OSP samples – vines and roots) that show the different sweet potato/OSP diseases and type of damage caused. If there is a nearby sweet potato/OSP field, with guidance from the trainer, let the participants go there to identify the diseases (and differentiate pest from disease attack).

- Wrap up the session with a general discussion, then end with the key message, “*correctly identify OSP diseases and the damage caused so that you can select the most appropriate control methods*”

Session eleven

Objective 2: identifying most appropriate OSP/sweet potato disease control options that fit their local/specific contexts

- Introduce the session and its importance to the participants while showing the link or relationship with the previous session(s).
- Let the participants know that they are going to discuss the control methods used for each of the identified diseases. Divide the participants into 2-4 sub-groups. Let each subgroup discuss the control methods used in the area for the generated diseases, including the advantages and disadvantages of the methods. In the interest of time and deeper coverage, it is advisable that different subgroups discuss different diseases. Recommend that each group writes its outputs on a flip sheet.
- Let each of the sub-groups present their outputs to the plenary. Allow few questions, comments, additions and points of clarification after each presentation. As each group presents, take note of common issues as well as contradicting issues that (may) emerge. Seek clarification especially in contradicting issues after all have presented. The rationale behind this exercise is to come up with collective comprehensive list (and description) of sweet potato/OSP disease control methods used/known.
- Make another brief presentation of the content you (the trainer) had already prepared on control options for the different sweet potato/OSP diseases.
- Allow time for a general discussion about the content (sweet potato/OSP diseases and their control). Encourage participants to integrate their traditional control methods with the presented methods so as to decide on the most appropriate sweet potato disease control option that best fits their specific contexts.
- Wrap up the session with a key message, “*Use both cultural and recommended methods to control diseases for more profitable OSP production*”

Reference notes: some common sweet potato/OSP diseases and their control

Sweet potato virus disease: *this disease tends to create mottling and mosaic on the leaves causing* up to 100% yield loss. Control options include: using clean/healthy vines, rouging diseases plants as soon as they appear in the field (hence need for regular monitoring of the field), crop rotation, plant new fields in new sites, position the new field away from the old field to minimize chances of aphids and white flies that spread the disease from crossing to the new field,

Sweet potato leaf spot: This disease creates spots/brownish lesions on the leaves. Control options include: destruction of infected crop materials, use of clean planting material, crop rotation



Topic 5: Maturity Period

Introduction

Harvesting of mature sweet potato roots at the most appropriate time is one of the most important activities that will ensure reduced waste due to pests/diseases. Farmers have different signs, other than the recommended maturity period, that they use to assess sweet potato maturity. The signs may be misleading and can be right or wrong. The harvesting and post harvest handling methods used are numerous, though some have a negative effect on the quality and quantity of the ultimate OSP/sweet potato. Quality in this context refers to taste (sweetness), firmness of the skin, mealiness (degree of hardness), intensity of the orange color (the deeper the color the higher the Vitamin A content present), and characteristic smell (physiologically immature OSP roots tend to have some undesirable characteristic smell). The general objective of introducing and discussing with farmers about harvesting and post harvest handling is to make sure appropriate practices are used to boost the yields and quality realized. This content helps farmers to make informed decisions and adequate plans for both home consumption and marketing.

Objectives

At the end of the session participants should be able to:

- 1) Analyze criteria traditionally used in deciding upon OSP maturity and its implication on quality of roots (under quality, we look at taste, firmness of the skin, mealiness (degree of hardness), intensity of color, characteristic smell).

Materials needed: Flip charts, markers, masking tape

Average time: 2 hours and 30 minutes

Session twelve

Objective 1: analyzing criteria/parameters traditionally used in deciding upon maturity and its implication on quality of the tubers

Procedure/steps to guide this session

- Introduce the session and its importance.
- Use an appropriate open ended question, in plenary, to find out when participants harvest sweet potato/OSP with focus on indicators used to tell the maturity of different sweet potato/OSP varieties in the field. Write the indicators on a flip chart/sheet as participants mention them. From the list generated, pull out the indicators.
- Divide the participants into 3-4 subgroups. Assign different indicators to the different subgroups. Let each subgroup discuss and come up with the effects on the harvest period and indicator to the quality of the OSP.
- Allow each of the subgroups to present their outputs to plenary. Let participants make contributions (individual experiences, questions, clarifications, comments) after every presentation. The rationale behind this arrangement is to come up with comprehensive analysis of each of the indicators as experienced by the various participants.
- Make a presentation of the already prepared content (as a trainer) on parameters/indicators to be considered to tell OSP/sweet potato maturity in the field.
- Allow a general discussion, in plenary, for internalization of the (trainers) presentation. Encourage the participants to integrate their traditional indicators with the

trainers/recommended indicators so as to come up with more appropriate OSP maturity indicators that they can use in future.

- Wrap up the session with key message, *“Harvest mature OSP according to the appropriate indicators so that you will benefit for home consumption and for the market value”*

Topic 6: Sweet potato/OSP vine multiplication and conservation

Introduction

This topic mainly targets commercial sweet potato/OSP vine multipliers or producers. Sweet potato planting material is one of the most limiting factors in sweet potato production and rarely available (both in quality and quantity) at the time it is needed. Many times, the vines dry off under the sun during the dry season, leaving the farmers with almost no vine. The few planting materials available at the onset of the planting season are often diseased and/or infected by pests. This situation affects timely planting and consequently the ultimate yields both in terms of quality and quantity. There is therefore need to conserve planting materials. Vines in Uganda are generally not sourced from market places but from own/old fields. There is therefore great need to help farmers learn how best to produce and access quality planting material when it is needed (on set of rains or planting season). It is also important to have farmers specialized in production and sale (distribution) of the vines timely vine access is to be achieved. The prospective vine producers have inadequate information and need to be trained on how to rapidly multiply vines since they are likely to be the main sources of vines in the local areas.

Objective(s)

At the end of the session the participants should be able to

- 1) analyze current situation with regard to sweet potato/OSP vine multiplication and conservation for adequacy in terms of quantity and quality
- 2) analyze the various vine seed production methods/schemes and choose the most appropriate in the local context

Materials needed: Flip charts, markers, masking tape, sweet potato vine samples, and knife

Average time: 3 hours

Session thirteen

Objective 1: analyzing current situation with regard to sweet potato/OSP vine multiplication and conservation for adequacy in quantity and quality

Procedure/steps to guide this session

- Introduce the topic/session and its importance while relating it to the previous sessions/topics.
- In plenary session, ask an open ended question that seeks to find out the different sources of sweet potato/OSP vines used or known by participants in the area. Note the sources mentioned on a flip chart so that every participant follows.
- Divide the participants in 3-4 subgroups and assign each subgroup a different source to discuss about. Each subgroup should come up with (a) the advantages and disadvantages of the vine source assigned to it, (b) the quality and quantity of the vines from those sources and their implications to the potential markets (well written on flip charts)
- Let each subgroup present their outputs to plenary. Allow contributions (experiences, clarifications, comments, etc) after each presentation. Encourage the participants to identify the most promising vine source that attempts to satisfy the quality and quantity of vines better.
- Make a brief presentation on the general sources and characteristics of sweet potato vines
- Allow a discussion that attempts to integrate available experiences and so that participants come up with the most appropriate vine source.
- Wrap the session up with the key messages:
 - ***“Conserve vines to enable you to do an early planting and get better yields”***
 - ***“Integrate the new techniques for vine multiplication into the existing vine multiplication system of the area”***

Reference notes: sweet potato vine sources

The common local vine sources include ***root slips or sprouts*** from previous fields. It is the most reliable source especially after a prolonged dry spell and allows farmers to produce vines under minimal soil moisture conditions. Use of root sprouts, however, contributes to spread of pests and diseases, and causes a delay getting planting material since one has to wait until vines attain harvestable length (30 cm) excluding the stump (15 – 20 cm). For effective use of this source, there is need to explore deliberate production of vines using clean roots, as well as use of moisture retaining sites for multiplication. Small and medium sized roots provide more vines for seed vine production as compared to large sized roots.

Growing/previous sweet potato fields are another source of vines. This source offers adequate access to planting material and allows timely planting. It however spread of pests and disease because the primary production is roots and not vines. Effective use of this source calls for cautiously consideration of pest and disease management issues/strategies. ***Off season low land sweet potato crop*** also provides a source of vines. In this case, vines are available on time and in larger quantities. Crop protection measures are essential too.

Appendix: Optional Topic - Yield Estimate

Objective: Estimating OSP yields in a given area of land/field

Note: This topic is more appropriate for farmers who are growing OSP for commercial reasons. It does NOT apply to subsistence farmers.

Procedure/steps to guide this session

- Introduce the session and its importance with links to the previous session(s).
- In plenary, find out the areas or size of land, on average, that participants use for OSP/sweet potato production (irrespective of purpose: home consumption or market). List the areas mentioned on a flip chart.
- Inquire what they normally estimate as the yield from the different field sizes, how they do their estimation and what yields they actually realize.
- Encourage the participants to analyze the methods used in estimating the yields for accuracy in determining the actual yield.
- Make a presentation on how to accurately estimate OSP/sweet potato yields in a given piece of land. This involves making diagonal walks to determine the center of the plot, taking 3-4 footsteps in different directions to get 5 mounds for sampling. Harvest the mounds and record the total (and average) number of OSP root tubers harvested (including the weevil damaged and the undamaged). Record the weight. Estimate the expected yield by multiplying the average number of roots by the total number of mounds. Reinforce this presentation with a practical demonstration for participants.
- Allow a brief discussion for internalization.

Reference notes: OSP/sweet potato harvesting and yield estimate

Harvesting: Sweet potato roots are ready for harvesting between 3 and 8 months after planting. Varieties such as Ejumula, Kabode, Kakamega and Vita mature within 5 months after planting. If the crop is harvested too early the roots will not be fully developed and when harvested too late the roots may be fibrous and possibly pest-infested thus reducing yields. Sweet potato is harvested using either the piecemeal or complete method.

Piecemeal harvesting involves harvesting few roots from selected mounds/ridge spots. It involves looking for cracks on the mounds/ridges, which are perceived to indicate presence of a sizeable root and removing only larger roots. After, the created gap is earthed to cover the younger/smaller roots to allow continued bulking. The practice normally starts as early as 2 months after planting for some varieties. Varieties with longer maturity periods are usually more suitable for piecemeal method than early maturing ones which have all their storage roots maturing at almost the same time. Harvest duration is a function of variety, soil type, availability of other foods, household size, disease and pest infestation and weather conditions.

Complete harvesting involves wholesale removal of the whole crop at once irrespective of whether all the roots are mature or not and is mainly for commercial sweet potato growing.

Estimation of sweet potato/OFSP root yield: Estimation of root yield under the piecemeal type of harvesting is normally difficult. Even under wholesale harvesting farmers can only recall the number of bags of marketable roots but not the quantity of smaller roots that could not be sold. On average a bag of marketable roots ranges from 150 to 180 kg. The number of plants in the selected sample unit are counted and recorded, and the quantity of storage roots in the field can be easily assessed by estimating the yield of three representative sample units of 2 m² each. The harvested sample roots are counted and weighed then an average of all the samples is extrapolated into either acre or hectare standard units of area.

Section three

4.0 Nutrition and Orange Sweet Potato

4.1 Background

This section or component focuses on promoting nutrition and consumption of vitamin A rich sweet potato/OSP in adequate amounts for a good health. Vitamin A is one of the vital micronutrients needed for effective development and functioning of the human body. OSP is one of the cheapest and easily accessible sources of vitamin A that can be consumed regularly. Although mothers and children below 5 years are the most vulnerable to vitamin A deficiency disorders, other segments of the population are also vulnerable. This therefore implies that the training on importance of food and consumption of Vitamin A applies to all human beings and is a collective responsibility. This component focuses mainly on food and its functions, which gives a background of the importance food in general, the importance of vitamin A to the human body, and infant and young child feeding in which bits of maternal nutrition and hygiene and sanitation have been integrated.

Topic 1: Food and its functions

Introduction

Food plays various roles/functions in our bodies and the functions are inter-related. To live a healthy life we must eat a mixture of foods in appropriate quantities and quality. We need foods that give us energy, food that promote growth and repair and foods that protect us from diseases. Many people eat food for different reasons that range from getting satisfied, preference in taste, attitude of value attached to it and just eating because the food is available. Eating food for the sake of it may not provide the body with what is required for proper functioning and development. People need to deliberately eat the right kind of food in the right combination that is needed by the body. Focus on the food and its functions is to create awareness about the importance food in general as a key factor to healthy living and lay a foundation for the study of vitamin A.

Objectives

By the end of the training on the topic food and its functions, the trainees should be able to:

- 1) know and clearly understand the value and importance of food in our bodies, including OSP, therefore the practice of adequate feeding
- 2) categorize the different foods by the value they have for our bodies
- 3) effectively prepare a balanced diet using locally available food stuff in their contexts
- 4) develop a work plan on how to conduct the same training on food and nutrition to other people

Note: Though all the four objectives are interdependent, one building on to the other, each objective will be handled at a time as a session.

Materials: (a) Two charts. One that shows categorization or grouping of food into the three different food categories of body building (proteins), energy giving (carbohydrates) and body protective (vitamins). Another chart gives examples of the different ways food is prepared. (b) Small quantities of the different foods and/or pictures representing the different food

stuffs (let the trainees know about the need to come along with some foods to the training site in advance)

Average time: 3 hours

Session fourteen

Objective 1: participants knowing and having a clear understanding of the value or importance of food

Procedure/steps to guide this session

- Introduce the topic/session and well written out objective(s) of the session to the participants. Expectations of the participants may be explored and harmonized with the objectives of the session.
- With a brief brainstorming session, find out what participants refer to as food (probably some foods are not seen as food). Through a facilitated discussion, the trainees may come up with a common understanding of what food is (not definition).
- Find out from the participants/trainees why people eat food. This can be handled using small group discussions or brainstorming. The rationale behind this step is twofold: one, to get an understanding of the value people attach to food; two, to get a foundation on which to build the prepared content of the value or importance of food in human body.
- The trainer then makes a brief presentation giving the general importance and functions of food in our bodies and therefore the need to eat adequate quantities and quality of food. Use the chart showing the grouping of foods to illustrate this grouping.
- **Note:** The trainer should also bring up the importance of practicing good hygiene practices to avoid food contamination and infection thus loss of what has been consumed.
- This can be crowned with a brief discussion and key message of the session “*Eat food with value attached in mind and ensure the food and things you use are clean*”

Session fifteen

Objective 2: Grouping the different foods by the value they have for our bodies

Procedure to guide this session

- Introduce the session (sub-topic framed by trainer and reflected in the objective) and objective of this session to the participants, while linking it to the previous session. Participants need to know how the previous session becomes a building block of the subsequent sessions. It is always better to first know what the participants have in mind as their (desired) objective related to the topic then harmonize it with the intended or planned learning objective. This does not only make the exercise participatory but invites the participants to be alert.
- Using a guided brainstorming session let the trainees mention or list the various foods available in the area.
- Group the trainees into 3-4 sub groups (depending on time available and number of participants). Ask each group to categorize the (listed) foods based on their own criteria. Food items or pictures of the different food stuffs are useful in making the exercise practical and participatory. In this case, each group is given the same sets of foods (items, or pictures) and does its own categorization or grouping of the foods. The objective

behind this exercise is to find out and understand farmers’ rationale of categorizing the different available foods (see an example of food cards below).

- Each group presents their categories/groups. Making the other groups to move to the presenting group makes the exercise livelier than making the presenters to move in front. Questions and comments are then invited from participants. In the process, the trainer is listening and observing very carefully, taking note of farmers’ rationale, ‘wrongly’ categorized foods and any other important issues that may emerge and need clarification or correcting.
- At this point, make a short presentation on the three major food groups/categorization’, rationale behind the grouping/categorization and value of each category to the body. Use of a chart showing the different foods categorized into the three major groups helps reinforce the engagement of the participants with the content and process. This will make the participants discover where they could have made mistakes.
- Allow a discussion that seeks for areas of harmony or contradiction between the groups’ presentations and the trainer’s presentation. It is at this point that the areas of harmony are strengthened and areas of contradiction (misleading rationale and wrongly categorized foods) clarified. The notes and observations that were made during the group categorization exercise are more useful at this point.
- Discuss why foods are grouped that way and the concept of nutrient dense foods. Use the example of OSP, groundnuts, fish, milk as nutrient dense foods
- Present the key or take home message: ***“Eat food from the different categories in a meal/day”***

Cards that can be used in the food grouping exercise



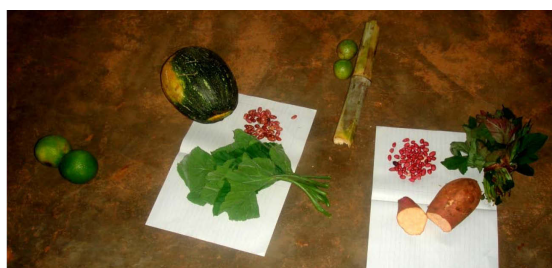
Objective 3: Preparation of a balanced diet

This session is divided into two sub-sessions: I- understanding the concept of balanced diet and II – exploring challenges of preparing balanced diets among communities

Procedure/steps to guide this session

Sub-session I: Understanding the concept of balanced diet

- Introduce the topic and objective of the session with linkage to the previous one.
- Group the trainees into 3-4 and ask them to come up with diets that are common in the area (at least two). The point behind this is to review the adequacy of the meals in terms of the 3 food categories that are needed by the body. As the trainees come up with the common diets, carefully observe or look out for situations of food wastage besides adequacy in value.
- Allow brief discussions or comments after each individual group presentation on common meal then open a more general discussion. In this case you are giving the trainees opportunity to ‘critique’ or find strengths and gaps in what they have been taking as a complete meal. Bring out the issue of adequacy (in terms of quality/value and quantity avoiding waste of food and poor hygiene). Find out where the different groups place the OSP and why?
- Introduce the concept of balanced diet. You may open up by finding out what they (trainees/participants) understand by balanced diet (can be a short brainstorming exercise) then present what a balanced diet actually is. Allow a short discussion for the people to internalize the concept. Emphasize the richness of OSP in two food groups (vitamin and carbohydrate).
- Discuss the role of the 3 food categories in the body, highlighting the way they interact, and the importance of having a mixed meal/balanced diet; to improve digestion and assimilation.
- Illustrate the importance of a balanced diet (need for the 3 food categories) using the concept of building a strong wall. The strength of a wall will depend on the type and amount of materials used. A strong wall is built with iron bars (skeleton - bones), blocks (protein/ building blocks for the body/, cement (vitamins/minerals) and all that work requires energy (carbohydrates). Similarly, a strong human body will require strong and healthy bones/skeleton, body building blocks – proteins, vitamins/minerals and carbohydrates for energy. All processes and activities performed by the body or part of the body require energy.
- Discuss the consequences of inadequate diets (what would happen if they are not available in adequate amounts) as a brief explanation of some of the symptoms of under-nutrition in all age groups and the vulnerability of children.
- Key message “*Eat a balanced diet in every meal to stay healthy*”



An example of simple meals composed of three food groups with a snack in between

1. Pumpkin, beans and greens
2. OSP, ground nuts and greens
3. Sugar cane/mangoes as snacks

Some reference: Balancing our meals

There is no such thing as an ideal diet. But to live a healthy life we must eat a mixture of foods, some that give energy, some that promote growth, and some that protect from disease. Children need adequate amounts of energy giving and body building foods because their bodies are growing rapidly.

A main meal should be a mixture of: Cereals, tubers or matooke; Pulses, beans or peas; and Vegetables, green leafy type and/or fruits. “**The triple mix**”

If animal foods are within the family budget and are normally consumed, then the addition of even a small quantity of animal food to a vegetable food mixture greatly improves the growth-promoting effect. This is especially important in the feeding of infants and young children so adding small fish or milk to sauce or porridge is very good.

Mothers' breast milk is an excellent addition to vegetable food mixture in promoting growth of infants and very young children. That is why the advice to all mothers should be to continue breast-feeding as long as possible, because even a small quantity of mother's milk can greatly improve the quality of vegetable food supplements the infant or the young child is getting. This is more important if the mother cannot afford to give other types of milk (e.g., cow's milk) to her infant or child.

Ways of overcoming the challenge of preparing balanced meals;

- Preparing some food in advance; pounding the nuts before hand, grinding the millet in advance and keeping it ground
- Cooking food together; steaming, “*ekitobero*”, “*katogo*”, “*mugoyo*”, “*emangori*”
- Having pastes to add into the food like g-nut and simsim paste.

Sub-session II: Exploring challenges of preparing balanced diets in the community

- Start by reminding the trainees what has been coming out of the discussions under the topic/session/module, the main one being that most people rarely have balanced diets or complete meals.
- Then, pose a question that will guide you explore into the inadequacies / challenges that limit the preparation or acquisition of balanced diets, “why do you people here (referring to the trainees) fail to have complete meals?” List the reasons given then collectively discuss the reality related to each of them.
- Discuss the most feasible ways of minimizing or overcoming the inadequate meals (how to ensure balanced diets) within the prevailing local contexts.
- Explore the key message that the participants have got from the session, then reinforce it with what you will have prepared – “***Ensure each meal has the three food groups ((protein, carbohydrate and vitamin/mineral) to have it balanced, and integrate vitamin A rich sweet potato in your diets***”

Session seventeen

Objective 4: Developing a work plan on how to deliver the same content/module to others and evaluation

a) The work plan

This will be a group assignment. It will be aimed at getting a ‘feel’ of the extent to which the trainees will have understood the module/training both in content and process. The exercise will help trainees tap into each others’ creativity and come up with the most appropriate delivery method for the content. It will also build their confidence and make them own the process. In this way, the person training easily identifies mistakes that are likely to be made and rectifies them in time.

- In groups let the trainees discuss and come up with an outline that shows the flow of the content and a set of activities on how they will train others (farmers/promoters) this same content.
- Have each of the two groups present their output, discuss them, make contributions and agree on one harmonized final work plan that each of the trainees will use (for uniformity of flow and message).

b) Evaluation

Participants are asked to evaluate the training/session/module reflecting on their interaction or engagement with both the content and process. They are guided by three simple questions: What went well, what did not go well, and how we can improve.

This evaluation exercise will help you the trainer, to find out the extent to which the training has measured up to current realities in the community and expectations of the trainees as well as the extent to which the objective has been met or if there are areas they feel they need clarification.

Topic 2: Importance of Vitamin A

Introduction

The orange sweet potato is being introduced/ promoted because of its richness in vitamin A. OSP provides a cheap and easily accessible source of vitamin A as compared to other sources. Vitamin A is one of the most important nutrients required for healthy body and effective body functioning, yet often ignored by many people. One of every five children and pregnant mothers has vitamin A deficiency and this can be addressed by eating vitamin A rich foods. The main objective of training people about this module/topic is to build their knowledge about the importance of vitamin A, the sources of vitamin A and stimulate pro-activeness in ensuring presence of a vitamin A rich food is part of their meals.

Specific objectives: At the end of the training the trainees will be able to:

- 1) know and understand the importance / role of vitamin A (including vitamin A deficiency) in the body therefore the need to have vitamin A rich foods as regular as possible
- 2) identify the main sources of vitamin A from locally available food sources and proactively search for the Vitamin A rich foods to be part of their regular/daily diet

Materials: Chart illustrating the role of vitamin A in our bodies – Page 2 on training charts; posters showing Vitamin A-rich foods; locally available vitamin A rich foods – dark orange fruits and dark green vegetables; flip chart and markers

Session eighteen

Objective 1: Knowing/understanding the importance of Vitamin A in human body

Steps/procedure to guide this session

- Start with a recap of the previous module (food and its functions). You may do it yourself or use a participatory approach where one or two of the participants do it (with your back-up).
- Introduce the new topic “importance of vitamin A” and objectives while linking to the previous topic/session.
- Engage the trainees, in a brain storming session, to find out what they know about vitamin A in the human body. This gives you the trainer chance to know where to start from and how best to deliver the content more effectively.
- Make a presentation on role of vitamin A in the body and how vitamin A interacts with the other food categories (proteins and carbohydrates). A chart that has pictures showing role of vitamin A is useful at this point because it will engage the trainees more given that the topic may not be as known/common to them as the previous one. Use of a chart to illustrate the roles of vitamin A in the body makes the training more understandable.
- Open up a discussion following the presentation and emphasize the specific roles of vitamin A, what happens to the body that has vitamin A deficiency. Bring out the different disorders caused by VAD – dry membranes (xerophthalmia), night blindness, body development disorders, low immunity and slow recovery from disease. Use pictures to show effect of vitamin A deficiency on the eyes.
- Wrap this session with the key or take home message that the trainees will reflect on, **“Eat Vitamin A rich foods for the normal development and effective functioning of the human body”**. Emphasize the importance of OSP since it is a **staple** and it is possible to consume it in large amounts and frequently thus enabling building up of body stores.

Session nineteen

Objective 2: identifying the main sources of vitamin A

This session is also subdivided into two sub-sessions: I- the main sources of vitamin A; and II- preparation of a vitamin A rich meal.

Sub-session I – the main sources of vitamin A

Procedure/ steps to guide this session

- Introduce the objective of the session to come to a common expectation. Pose a question to find out what trainees think/see or know as foods that have vitamin A. List them (in an understandable language) on a flip chart so that everybody can see them clearly.
- Revisit the list and find out what makes the trainees think the listed foods have vitamin A (understand their rationale which will be later corrected, if wrong).

- Make a brief presentation on the sources of vitamin A (both animal and plant sources). Use a chart with pictures to visualize the vitamin A foods. Emphasize that although animal sources are superior to plant sources, OSP can provide adequate amounts with even other additional benefits (see chart for examples of Vitamin A rich foods).



- Discuss the importance of plant sources of vitamin A vs animal sources in terms of affordability, availability as well as accessibility by the body. Plant sources are cheaper, can be easily grown and are more available. Emphasize on what shows that a given food is richer in vitamin A than the other (i.e. the deeper the orange color in a fruit and the deeper the green color in the leafy vegetables, the higher the concentration of vitamin A).
- Ask the trainees to list foods that are more rich in vitamin A and those that are less rich in vitamin A. You can use different shades or intensities of green or orange to illustrate this. emphasize the orange and green colored food (crop) and small fish & liver (animal)
- Key message: ***“Eat foods richer in vitamin A as regularly as possible so that your body can replenish its vitamin A stores”***

Sub-session II - Preparing vitamin A rich meal

Procedure/ steps to guide this session

- Have the trainees divided into 2-4 groups and let each group come up with at least two meals with vitamin A-rich food including the orange-fleshed sweet potato used in the area. Let each group present the meals.
- Ask the trainees, to analyze the presented meals (above) for nutrients (balanced diet) and presence of Vitamin A (especially for children). Discuss feasible ways in which the meals presented can be improved, where necessary. Emphasize also the importance of having oil in the dishes consumed with OSP because fats help in absorption of vitamin A and therefore in accessibility of Vitamin A by the body.
- Explore the key message that the participants have got first then reinforce it with the expected key message – ***“Integrate vitamin A rich foods like OSP, fruits and vegetables into your diets as regularly as possible and combine vitamin A food with an oil rich food to increase its absorption”***

Objective 3: Developing a work plan on how to deliver the same content/message to promoters/caregivers

a) The work plan framework

- In groups let the trainees discuss and come up with an outline that shows the flow of the content and a set of activities (and most appropriate methods) on how they will train others (farmers/promoters) this same content.
- Have each of the two groups present their output (content and process), discuss them, make contributions and agree on one harmonized framework that each of the trainees will use (for uniformity of process flow and message delivery).

b) Evaluation

Participants are asked to evaluate the training/session/module reflecting on their interaction or engagement with both the content and process. Evaluate the exercise to find out the extent to which the training has measured up to current realities in the community and expectations of the trainees as well as the extent to which the set objective has been met or if there are areas they feel they need clarification). Different evaluation methods can be used. The most common and simple one is through guidance of simple questions: What went well, what did not go well, and how we can improve?

Some reference notes about Vitamin A

Vitamin A is a group of compounds that play an important role in vision, bone growth, reproduction, cell division, and cell differentiation (in which a cell becomes part of the brain, muscle, lungs, blood, or other specialized tissue.). Vitamin A helps regulate the immune system, which helps prevent or fight off infections by making white blood cells that destroy harmful bacteria and viruses. Vitamin A also may help white blood cell to fight infections more effectively. Vitamin A promotes healthy surface linings of the eyes and the respiratory, urinary, and intestinal tracts. When those linings break down, it becomes easier for bacteria to enter the body and cause infection. Vitamin A also helps the skin and mucous membranes function as a barrier to bacteria and viruses. In general, there are two categories of vitamin A, depending on whether the food source is an animal or a plant.

Sources of vitamin A: Vitamin A is found in foods that come from animals, what is referred to as pre-formed vitamin A. It is absorbed in the form of retinol, one of the most usable (active) forms of vitamin A. Sources include liver, whole milk, eggs and some fortified food products. Retinol can be made into retinal and retinoic acid (other active forms of vitamin A) in the body.

Vitamin A that is found in colorful fruits and vegetables is called provitamin A carotenoid. They can be made into retinol in the body.

Topic 3: Infant and young child feeding

Introduction

Vitamin A deficiency is high among children under five years of age. This project is aiming at addressing this deficiency in the target group using a food based approach (key food being introduced is OSP). However, there are special recommendations for feeding children below 5 years of age that need to be put into consideration when introducing OSP into children's diet. This section will look at the special considerations in feeding infants and young children, existing practices in the communities and work out ways of introducing the OSP into the children's diet so they can get more vitamin A in their diets. It will also look at the special considerations for a sick child and the importance of hygiene and sanitation in feeding children.

Objectives

By the end of the training the trainees should be able to:

- 1) analyze suitability of available foods for infants/children and choose the most appropriate foods for a balanced meal for children (normal and sick)
- 2) know and understand the most appropriate feeding patterns for infants and young children both normal and sick
- 3) try out different OSP recipes suitable for infant and young children

Materials: Charts on recommended feeding practices for infant and young children, chart showing how to feed older children (6 months to 2 years), chart showing methods of preparing complementary dishes with OSP, and cooked foods (whatever it is at home including OSP, beans, groundnuts, greens, avocado)

Average time: 3 hours and 30 minutes

Session twenty one

Objective 1: analyzing suitability of available foods for infants and choosing most appropriate foods for a balanced meal

Procedure/steps to guide this session

- Introduce the session and its importance to the participants as you show the link with previous sessions/topics. Prior to the session, ensure that the participants come with foods that will be used during practical sessions of food preparation. Encourage them to come with already cooked food samples and ripe fruits (ready to eat).
- Using an open ended question, explore what foods people in the area give infants and children. It is also important to find out how the foods are prepared or mixed for the infants/children. List the mentioned foods on a flip chart. This will help the trainer to get an understanding of what exactly mothers feed their infants/children on as well as identify gaps in the feeding of infants.
- Divide the participants into 3-4 subgroups. Let each subgroup discuss and analyze the foods prepared for infants and children in the area for: (a) Completeness (balanced diet), (b) Softness, (c) Suitability in respect to the child's age and level of development, and (d) Implication of the foods on the health of the infants/children.
- Let each subgroup come up with how OSP can be introduced in the infant's diets. Encourage the participants to differentiate between the age ranges (6-9 months, 9-12

months, and 1-2 years) if applicable in their context, because their feeding is slightly different. In this case, we are interested in knowing how the different foods are gradually introduced to the growing infant and how to change the quality and quantity of the food to suit the child at the different stages.

- Allow each of the subgroups to present their outputs to plenary and invite a general discussion after all the subgroups have presented. Follow up the discussion with a question that seeks to find out what participants feel or think should be the most appropriate food mixtures for infants/children.
- Make a brief presentation on appropriate feed and/or feed mixture for infants and children. Emphasize the importance of breastfeeding (and therefore appropriate feeding of an expecting and breastfeeding mother), and gradual introduction of solids including OSP in an infant's diet. Note that adequate feeding and foundation of sound health of a child begins from the mother's womb. Reinforce the presentation with visual aids like charts (See chart on infant and young child feeding).
- Open up or invite a discussion (comments or questions) from the participants with focus on what they see or take as the most appropriate food or food mixtures for infants/children and why.
- For enhanced understanding of the participants, reinforce the content presented with a practical exercise about preparation of appropriate infant/children food (target here is softness, appropriate food for the different age groups and balancing the diet using what is locally available). It is advisable to first allow the participants in 3-4 subgroups (you can maintain the first subgroups or use new ones) to show how they prepare the available foods for infants/children and the rationale behind it. Invite comments or contributions from plenary on what the subgroup (one at a time) needed to do to improve the appropriateness of the prepared food for infants/children. You can then correct mistakes and strengthen strong points for each subgroup. When one group is presenting, all the rest should pay adequate attention.
- Wrap up the session with the key or take home messages:
 - *“Exclusively breastfeed infants from 0-6 months”*
 - *“Feed infants/young children young on appropriate balanced food for better body development, functioning and health”*
 - *“Gradually introduce soft foods and porridges and continue breastfeeding for 2 years”*

Session twenty two

Objective 2: knowing and understanding the most appropriate feeding patterns for infants and children

Procedure/steps to guide this session

- Build on the previous session and bring out the current session with emphasis on the need to provide infants/children the right food (balanced and soft) in the right quantities and at the right intervals or patterns.
- Use an open ended question to engage the participants in discussion to find out the quantities and how frequent infants/children in the area or in their homes are fed. It is advisable that you get a clear picture across the different child/infant categories (0 - 6 months, 6 -7 months, 8 months, 9 - 12 months and 12 - 24 months). Follow this up with a question on how or whether the situation of feeding pattern is different between a normal and sick child and why. Take note of the ideas on a flip chart/sheet because you will later refer to them.

- Divide the participants into 5 sub groups; each assigned a specific infant/child category. Let each subgroup analyze the different infant/child feeding patterns (in the area) for the category assigned to it for (a) appropriateness in quantity and frequency, and (b) implication on infant/child development and health. Let them show how this is different or the same with what was discussed above.
- Allow each subgroup to present its outputs to plenary. Because each group analyzed a different category, it is advisable to invite contributions after each presentation. Invite a general discussion after each sub-group has presented. Find out what people in the area base on to give specific quantities of food at specific frequency/intervals to infants/children. This will give insights into how they feed the weak or sickly infants/children.
- Make an already prepared presentation on appropriate or recommended infant/child feeding pattern. Emphasize the importance of age category, physical and physiological states of the infants/children as critical in feeding pattern. Compare it with what was presented bringing out the important points and correcting any misconceptions.
- Invite a brief discussion about the presentation. Make it clear to the participants that infants/children have small stomachs that can adequately handle small amounts of food and that infants/children have higher growth demands as compared to adults.
- In plenary, open up a discussion that brings out feeding practices/patterns of expecting and lactating mothers in the area. Let the participants analyze the implications of the practiced mother's feeding habits to the health and development of the baby.
- Wrap up the session with key or take home message, ***“Mothers need balanced diets and adequate rest for adequate milk production. Exclusively breastfeed infants below 6 months and there after gradually introduce soft food as the infants grow with continued breastfeeding”***

Session twenty three

Objective 3: trying out the different infant and young children OSP dishes

Procedure/steps to guide this session

- Ask the participants to go back in their different groups and let each group come up with a suitable dish for the age -group they had discussed. Only local foods should be used.
- Let each group present their dish and have the other members critique it and where necessary improve it.
- Discuss the possibility of having the target households prepare the prepared dish/ food for their children. If there are barriers, encourage farmers to think through and come up or work out feasible ways in which the barriers can be handled or addressed.
- Pose a question to check how many farmers have used OSP in preparing some dishes. Let those that have used OSP before demonstrate how they used it for the benefit of the rest. Make effort to sure the demonstrations are appropriate to feed infants and young children. Encourage those that have not used OSP in preparing any dish before to use the different (and corrected) demonstrated ways.
- Preparing and mixing local foods for children: Before preparing food, before eating it and before feeding children, the hands should be washed with soap and water. Germs that cannot be seen on dirty hands can be passed on to the food. These germs will be eaten with the food and may cause diarrhea and other illnesses. Cooking kills most germs. After cooking, handle food as little as possible and keep it in a covered container.

Reference notes for infant and young children feeding

At 0-6 months, provide exclusive breastfeeding.

At **6 months**, continue breastfeeding and introduce solids in very soft form. At 6 months, the breast milk alone does not adequately satisfy or meet body requirements of the growing infant. Start with soup, soft or fine porridge, and well mashed food. Make the porridge dilute enough to be handled by the growing young stomach and with adequate milk. Feed the 6 months infant with soft foods at a frequency of 1-2 times a day with about 3 table spoons per feed.

At 8 months – give porridge (enriched with milk) and/or mashed food at a frequency of 2-3 times a day with about two thirds of a (baby's) cup per feed.

At 9-12 months, introduce finely chopped food (finger food) plus one snack. Use the quantity of three quarters a (baby's cup) per feed.

At 12-24 months, introduce or give family food in chopped or mashed form plus two snacks. Give one cupful per feed at a frequency of 3 times per day.

Note that as the child grows from 6 to 24 months, increase the thickness, frequency and quantity of food to meet the growing body nutrient demands.

Example of time chart for feeding children (6 months to 2 years)

Time	What to feed the infant on	
	6 months – 12 months	12 months – 24 months
Early morning	Breast milk	Breast milk
Breakfast	Fruit juice/mashed fruit or cereal porridge with milk/groundnuts/oil	Fruit juice/mashed + cereal porridge with milk/groundnuts/sugar/oil
Midmorning	Mashed fruit or juice or milk /yoghurt	Fruit snack and /or cereal/nuts/potato
Lunch	Cereal/potato + legume/fish/yolk + avocado/greens (mashed)	Cereal/potato + legumes + greens/avocado
Afternoon	Fruit juice or mashed or milk/yoghurt	Milk drink or fruit
Evening	Cereal/potato + legume/fish/yolk + avocado/greens (mashed)	Cereal/potato + legume/fish + greens/avocado
Bedtime/Night	Breast milk	Breast milk

Section four

5.0 Market and Product Development

5.1 Background

The Marketing and Product Development component looks at training farmers to plan for marketing so that they learn to produce crops according to guidance or demand from the market. Marketing is not about selling only as most people tend to perceive it. It involves a range of considerations that range from planning to delivery of the desired product to the customer who needs it. Planning begins even before the product is actually produced. In marketing, the quality of the product is as important as the quantity. The component focuses on the following: basics of marketing of any crop under the 5 pillars of marketing; market linkage and chain actors; Farming as a Business (FAAB) that trains farmers to view agriculture as an enterprise in which they have to (invest) spend money, thought and time so as to make money; marketing in groups/collective marketing and value addition. Generally, the section is aimed at building awareness, knowledge and skill of participants to be more commercial oriented as they cultivate OSP.

Topic 1: The Five Pillars of Marketing

Introduction

Planning for a product to be marketed is very important and is embedded in the five pillars, sometimes referred to as the marketing mix (each of them is dependent on the other and requires planning). The five pillars referred to are: *Product* – what to sell (Orange Sweet potatoes and its products); *Place* (where to sell - home or market); *Price* (how much to sell); *Promotion* (how to draw attention or create interest in the product); and *People* –those who buy and sell who we call market chain actors (that is farmers, traders, processors and consumers)

Objectives

By the end of the training on market chains and market linkages, participants should be able to:

1. Use the 5 Pillars of marketing to effectively plan and sell their OSP and other products/produce.
2. Identify and create a contact list of market chain actors involved in marketing OSP and/or other products in their areas
3. Analyze the different (identified) actors for roles and effectiveness in promoting marketing of OSP and/or other products

For effectiveness, each objective will have its own set of procedure. This will help the trainer to effectively find out the extent to her/his training has realized the set objective and therefore give them opportunity to make appropriate adjustment either in content or process.

Time: 2 hours

Materials: Flip chart, markers

Session twenty four

Objective 1: participants to be equipped with basic knowledge that will guide them in making effective market plans for commercial OSP production

Procedure/steps to guide this session

- Prior to the training, request each of the participants to bring at least one OSP for the training and if it is out of season, those who have will bring.
- At the training site, welcome the trainees and introduce the topic and objectives of the day. You may engage them in brief discussion about the objectives so as to harmonize their expectations with the objectives of the training or training session. Link this with the reason why they were requested to carry OSP specimens and request them to put/collect the OSP in one place.
- Explore knowledge of the trainees about the 5 pillars. This could be through a role play. Request for 4-6 volunteers who will make a role play using the collected OSP to depict a market scene with people buying and selling sweet potatoes in their usual context. As the 4 perform the role play, the rest are observant.
- Process the role play with the objective of identifying the 5 pillars in that marketing scene. From the participants' observations, find out what the participants observed during the role play. Keep noting their observations and keep probing so as to get all the 5 pillars out. From the list of observations, point out the 5 pillars specifically.
- Make a brief presentation, if necessary, about the five pillars and engage the trainees in discussing the importance of each pillar. Use the visual aid/picture (on the 5 pillars on marketing) to reinforce and summarize the content.
- Explore the key or take home message behind the session, then present what has been prepared, “ *Use the 5 pillars of marketing for effective planning in/for marketing*”

Some reference notes: The 5 pillars of marketing

Planning for marketing involves: determining what the customer wants; that is the **Product** (in this case it is the OSP and its products) in adequate quantities and quality whenever needed by a customer/buyer. Particularly the farmer should consider which varieties to grow or sell, which ones are selling in the market and whether value addition is needed. Furthermore, the farmer should consider what competing crops are selling, what quality of the product is needed to compete favorably in the market, amount of OSP to deliver each time and most important to know the customer preferences like the taste/color/aroma of the OSP.

It is important to deliver the product/OSP to a **Place** where the customer will easily access (reach or see) in order to purchase it. Other things to consider include where to sell (home, at the farm, grocery shop, supermarket, village market, international market), position on shelf or in the store/market, who can help distribute the OSP and determining whether to use middlemen (brokers, exchanges, etc). One should also consider the type and cost of transportation, methods of storage and costs as well as decide whether to use farmer groups or form an association to bulk sales. Ensure that the place is clean to encourage buyers to come.

The farmer has to determine a profitable and attractive **Price** for the OSP. One should set or adjust the OSP price basing on (a) production and marketing costs, (b) the profit margin over costs, and (c) prices of competing products (like bananas, cassava and others – depending on the context). Understanding seasonal supply and demand changes for sweetpotato/OSP and determining whether customer purchases are based on price, quality or convenience is important. In commercial transactions sellers set the highest price possible, however, it is important to set a price that buyers can realistically afford.

Under **Promotion**, the farmer has to create awareness to inform the customer about existence or presence of OSP thereby raising buyers' interest. He/she has to provide information to potential buyers by advertising OSP like using cardboard, putting up sign posts about OSP availability and price. Other ways of OSP promotion

include giving out samples of OSP roots or free additional on purchase, exhibiting at field days or special occasions as well as creating a brand or positive image about OSP.

Finally the farmer(s) should identify *People* who will be involved in the transactions during sale of OSP. These are the market chain actors who are involved in the transactions. Market chain actors include the farmers, brokers, retailers, wholesalers, processors and consumers (Individuals, Schools, Factories and Barracks). They will be discussed in detail in the next session. The farmer group should select a person to collect market information and identify the members responsible to supply OSP to the selling point each day.

Session twenty five

Objective 2: Identifying actors in the market chain - Creating Chain actors' contact list

Linking with Market Chain Actors

The 5th pillar of marketing is people and these are the market chain actors involved in the marketing of sweet potatoes from the farmer to the final consumer. The market chain actors include; farmers/ producers, traders, processors/millers, transporters and consumers. There are various traders at different levels who include; those who buy in large volumes (wholesalers), those who buy in small volumes (retailers) and brokers (play a linking role). These traders can bulk the product using different means ranging from carrying manually, wheelbarrows, bicycles to vehicles. Previously, the different actors used to work independently sometimes cheating each other in search of extra profit margins. Actually, they depend and need each other to survive in business. Every actor has an important role that they play to make the system function, and all are inter-dependent.

NGOs that were supporting farmers to produce took up the role of bulking and marketing produce for the farmers. However, that system left farmers passive and denied them chance to improve their marketing knowledge and skills and to become self reliant. This created a dependency-syndrome hence leading to an unsustainable marketing system. It is important that NGOs that are supporting production and marketing at lower level play more of a facilitative role by linking farmers to traders, hence, guide farmers into proactive marketing – which will lead to a more sustainable system.

Materials required: Flip chart, markers

Total time allocated: 3 hours

Procedure/ Steps to guide this session

The farmers should be able to collect information (get details) about reliable traders or other actors in the chain, in their area/contexts, that will be used to make contact or develop linkage. The steps or procedure to be followed in creating a chain actors' contact list are as below:

- Prior to the training, recommend that participants visit different markets around them and collect names (and other details) of sweet potato market chain actors (traders, processors, transporters, etc). They should collect the details in a simple way. Encourage the trainees to have discussions or dialogue with their identified traders on marketing of OSP.
- On meeting for the training, find out how the exercise went on and what happened.

- Find out the basic information they collected and their reason behind choosing that information. Explore what other important information they ought to have collected/know about the prospective market chain actors identified.
- Let each participant give the details of traders he/she collected. From each participants responses, create a combined contact list for the area. At this level, the contact list that will have been developed is very likely to focus on only one category of actors – the traders, yet we want the participants to be aware of actors in the entire chain.
- Explore knowledge of participants about actors in the market chain using a role play depicting a market scene in the area.
- Process the role play by asking probing questions that seek to: make participants identify the different actors in the chain – ensure all the actors are identified, let farmers know that they are key actors in the chain, to make participants realize the importance of each actor in the chain.
- Make a presentation of the different actors in the chain and their roles. This will be building on the role play above. Use the Table on Market Chain Actors and their Roles found in the notes to reinforce the content.
- Invite participants in a brief discussion about the actors and their roles.
- Ask the participants to integrate other actors (as observed in the role play) into the contact list – in addition to the traders. In this way, we will be creating a broader contact list that comprises of actors in the entire chain or actors in the different categories. The contact list of market chain actors should be regularly up dated with time – encourage it.
- Use the Promoter training Aid on the pages under “Market Chain and Market Linkages” to reinforce the training.
- Wrap up the session with a key message, *“Identify traders that are interested in what you produce”*

Session twenty six

Objective 3: Analysis of the different (identified) actors – looking at roles and effectiveness in promoting marketing of OSP and/or other products


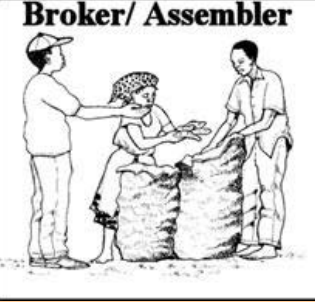
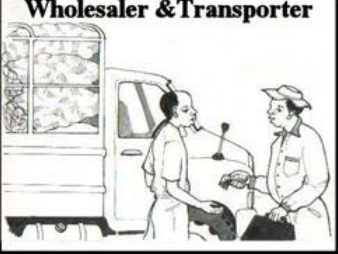


Procedure/steps to guide this session

- Introduce the sub-topic (framed by the trainer to suit the current session) and objective to the participants to have them focused. In the process make references and linkage with the previous sub-topic on creating a contact list.
- Divide the participants into sub-groups with each looking at a different category of market chain actors as reflected in the broader database. Let each group come up with criteria they would use to choose specific individuals to work with under that category (want to find out what they consider in choosing who to work with). Let the group members analyze specific individuals they work within the chain using the criteria.
- Let each group make its presentation about their findings. Invite contributions from others about the findings.
- Make a brief presentation on the importance and process of analyzing the different actors. Allow a brief discussion for general clarification and harmonization on the content.
- Emphasize the key message, *“From the identified traders, select a few reliable traders and link with them for business”*

Some reference notes: What is a market chain?

It is the transferring of sweet potatoes from the place they are produced to where they are eaten during marketing. This is movement from farmers until sweet potatoes reach consumers.

Table of Market Chain Actors and their Roles in OSP Marketing

Market chain actors	Roles
<p style="text-align: center;">Farmer</p> 	<ul style="list-style-type: none"> • Produces orange sweet potatoes • Sell to different chain actors depending on location
<p style="text-align: center;">Broker/ Assembler</p> 	<ul style="list-style-type: none"> • Contacts the wholesalers to buy OSP from the area • Distributes empty bags to farmers and pays harvesters, packers and transporter from farms to trading centres or main roads • Assembles bags from different farms and areas • Makes payments to farmers
<p style="text-align: center;">Wholesaler & Transporter</p> 	<p>Wholesaler</p> <ul style="list-style-type: none"> • Brings the money for buying OSP • Hires trucks and organizes transportation to towns • Searches for OSP in districts, • Distributes OSP bags to retailers by taking to different markets in towns • Pays market dues for off-loaded OSP bags in markets <p>Transporter</p> <ul style="list-style-type: none"> • Brings/owns the trucks or bicycle, usually works with the wholesaler or broker.
<p style="text-align: center;">Urban broker</p>	<ul style="list-style-type: none"> • Distributes OSP bags to retailers in different markets in towns on behalf of wholesaler for a commission
<p style="text-align: center;">Retailer</p> 	<ul style="list-style-type: none"> • Disassembles the bags into heaps by size of OSP • Take OSP close to consumers in different locations like small kiosks in trading centres.
<p style="text-align: center;">Consumer</p> 	<ul style="list-style-type: none"> • Buys the OSP for home consumption, for sale as fries/chips, food in restaurants or roasted OSP

Topic 2: Farming as a Business (FAAB)

Introduction

FAAB is commercialization of farming or farmers producing for income. It enables farmers to learn to take farming as an enterprise, in which they have to spend money in order to make money. FAAB training enables farmers to go through the mathematics of production and marketing for profit. FAAB is about making money and more money so that farmers have a source of income from their efforts. It increases the farmers' self esteem and breaks the poverty mentality; hence transition from subsistence to semi-commercial or commercial farming.

Objectives

Participants should be able to:

- 1) Set a realistic minimum selling price for OSP using the production costs incurred during OSP production.
- 2) Make logical decisions on where and when to sell their OSP using marketing costs.

Materials needed: Flip chart and markers

Time allocated: 3 hours

Session twenty seven

Objective 1: setting a realistic minimum selling price of OSP based on records about costs of production

Procedure/Steps to guide this session

- Engage the participants in a discussion that leads to how they set the selling price and what they base on to calculate the price.
- Request 2-3 participants who engage in selling OSP to share their experience on how they set their price.
- Introduce the session and its importance to the participants. Refer to **session three** on "Development of an Area Specific Annual Sweet Potato Production Calendar".
- Through a brainstorming session, engage the participants in a discussion on the recap of which activities they kept records on about sweet potato production and how the records are used. This will give insights on what information they regard as important. Take note of the ideas on a flip chart. Probe further to get all the activities done during sweet potato production.
- Divide the participants into 3-4 small groups to explore the costs for the different activities involved in producing 1 acre of sweet potatoes. Encourage them to write their outputs on flip charts. Emphasize the importance of recording and costing family labor. Advise them to sum up the different costs to get the total production costs.
- **Total production costs** divided by **Total estimated yield from 1 acre** is **Production cost per bag** or **Minimum Selling Price**.
- Allow all the groups to present their outputs first then invite open discussion. In plenary, with your guidance, let participants synthesize how records are used for setting a price.

- Emphasize the importance of using the records and costs kept on all activities in production. The rationale the exercise of synthesizing the points raised here is to get generic ways in which participants can use records in production.
- Wrap up the session with a key message, ***“Use your records on costs of production in setting a realistic price for OSP/product”***

Some reference: how to use production costs to set a selling price for OSP

Activities	Costs
Land preparation	40,000
Ploughing X2	60,000
Making heaps (10,000 heaps)	200,000
Purchase of vines (10 bags)	150,000
Planting	30,000
Weeding X2	60,000
Total Production costs (Shs)	540,000
Yields	
Estimated yield in bags	
Production costs per bag or minimum selling price per bag (Shs)	60
	540,000/60 = 9,000/=

For farmers to determine the selling price, they use the total production costs and divide it by the estimated yield or number of bags harvested in the whole plot of land. The result is the selling price. In the example shown above, the farmer should not sell below 9,000/= per bag because it is the minimum selling price. If a trader offers a price below, s/he will be making a loss. Any price offered above 9,000/= is acceptable. When a marketing group is bargaining for a price, it should be above 9,000/= per bag.

Session twenty eight

Objective 2: Make proper decisions on where and when to sell using marketing costs.

Procedure/Steps to guide this session

- Before the training, trainees should get the price per bag of sweet potatoes in the market or the price per bag when selling at home.
- Introduce the session and its importance to the participants while making reference to the previous session on production costs. Explain to them the reason for collecting the prices in the market and village as a guide in market information and decision making. Note down on the flip chart, the prices they collected from the markets and the village.
- Explore the participants’ knowledge on marketing costs by having a discussion on the different activities they carry out when marketing OSP or other sweet potatoes. Write the ideas on a flip chart.
- Conduct a group exercise by dividing the participants into two groups; one for selling at home and the other for taking to the market. The group members should record on a flip chart all the activities involved in the marketing as well as the costs for those activities when marketing OSP or other sweet potato varieties.
- Ask each group to sum up the marketing costs they got for the different activities. Explain to them that for the exercise, they will be using the same yield or total number of bags from an acre that they used under session twenty-nine – on production costs.
- Request them to get the **marketing cost per bag** (Item 13 in Example 2 below) by dividing the **Total marketing costs** (Item 11 in Example 2 below) they have got in their group with the **total number of bags from 1 acre** (Item 12 in Example 2 below).

- Ask them to calculate finally the Production Costs per bag/ minimum selling price (Item 14 in Example 2) plus Marketing Costs per bag (Item 13) = *Final Selling Price (Item 15 in Example 2)*.
- Invite the groups to present their findings and find out from participants which decision they would take after the presentations.
- Encourage a discussion on what participants would do differently after the training. Get one participant to wrap up so as to reinforce the importance of marketing costs in decision making on when and where to sell OSP.
- Wrap up the session with a key message, *“In order to make good decisions before marketing, calculate all the likely marketing costs for OSP/products”*

Example 2: Calculating Marketing Costs when selling at home or taking to the market during normal Orange Sweet Potato Season

	Sell in market	Sell at home
Market /farm-gate price per bag	20,000/=	15,000/=
Costs		
Harvesting (1,500/= per bag)	90,000/=	90,000/=
Empty gunny bags (800/= per bag)	48,000/=	48,000/=
Grading and sorting (500/= per bag)	30,000/=	30,000/=
Packaging (1,000/= per bag)	60,000/=	60,000/=
Loading and off-loading (1000/=)	60,000/=	-
Total transport costs (5,000/= per bag)	300,000/=	-
Market fees (500/= per bag)	30,000/=	-
Commission to agents (600/= per bag)	36,000/=	-
Food and accommodation	20,000/=	-
Total Marketing Costs	674,000/=	228,000/=
Number of bags from acre	60 bags	60 bags
Marketing Costs per bag	$674,000/60 = 11,233/=$	$228,000/60 = 3,800/=$
Production costs per bag	9,000/=	9,000/=
Expected Final Selling Price	$11,233+9,000 = 20,233/=$	$3,800+9,000 = 12,800/=$

The farmer taking the OSP to the market might think that because of the high market price of 20,000/=, s/he will make a lot of money by taking the produce to the market. However, there are a number of marketing costs involved before the produce is sold to the retailer in the market. The most costly is transport costs which are about 50% of the total marketing costs. In addition, there is risk of being cheated by some traders if he/she has not created market linkages with them.

The existing farm-gate price in the village is 15,000/= shillings per bag. The farmer selling at home by avoiding the transport costs is able to increase on the profit margin. If he/she adds value by grading and sorting as well as bagging the sweet potatoes and at the same time created a market linkage with traders, s/he can bargain for a price above 15,000/=. Both farmers make a profit from the sale of sweet potatoes, however, the one who sells at home gets a higher profit.

The expected final selling price is most important because the farmer has to put into consideration the costs of producing one bag of OSP or the minimum selling price got in session twenty-nine. The farmer has to determine the actual profit margin for the business of growing OSP. The decision is for the farmer to sell at home because there is a profit of 2,200/= per bag, yet if s/he is to take to the market, there will be a loss of 233/= per bag.

Topic 3: Marketing in Groups

Introduction

Marketing groups are people with similar needs like lack of markets or good prices who decide to bulk and sell their commodities together. Group marketing enables collective or bulking of produce so as to persuade traders to go and buy from them. It also allows those with small volumes (e.g. basins) to bulk with others so they can get a good price for their produce. This is possible because the farmer group does the bargaining with the trader. The group is able to follow up on the quality control or post-harvest handling of the OSP roots or vines to be sold.

Post-harvest handling of OSP roots and vines involves grading and sorting, storage, packaging and transportation. It reduces deterioration and loss in both quality and quantity of OSP after harvesting through grading and sorting of the roots before they are taken to the market.

Objectives: By the end of the training, participants should be able to:

1. Market OSP collectively in groups; and
2. Adequately sort and grade OSP for marketing

Materials: Flip chart, markers, samples of OSP roots of all sizes and damaged roots

Time: 3 hours

Session twenty nine

Objective 1: marketing OSP collectively in groups

Importance of session: Farmers are used to selling individually to any trader who contacts them. As a result, there is great price variation between farmers in the same area because it depends on one's ability to negotiate on the price. When farmers agree on bulking or collective marketing, they will then be able to bargain on the price.

Procedures /Steps to guide this session

- As part of preparation at the end of the previous training, request farmers to bring OSP roots for training on marketing in groups.
- Engage them in brief discussion about the objectives and harmonize their expectations with the objectives of the training session. Link this with the reason why they were requested to carry OSP specimens and request them to put/collect the OSP in one place.
- Using role play, have 6 volunteers to bring out the ways they have been selling sweet potatoes in their areas. Have the group discuss the advantages and disadvantages of the different ways of marketing depicted in the role play and note them down on a flip chart.
- Use the discussion to introduce the session and the importance of marketing in groups.
- Ask the farmers what they think about marketing in groups and the expected benefits? Guide them in identifying likely problems when marketing together and how they can avoid or overcome them. Note the answers on the flip chart. Use the Promoter Training Poster –Marketing in Groups to reinforce the message.
- Ask participants to present what they would do differently when they sell OSP or other sweet potato varieties the following harvest period. (*Note: Their responses will show whether they now appreciate selling in groups*).

- Key or take home message, ***“In order to attract traders and bargain for a good price, market in groups”***

Some reference notes: Why market in groups?

There are several reasons why people market in groups; these include,

- To have a big volume (Traders don't want to spend their money and time collecting small volumes of products in scattered areas, it is costly for them.)
- The group will have bargaining power (Farmers can negotiate with the trader so that they get a good price and that price will be the same for all the members which wouldn't be possible if farmers were selling individually.)
- Build relationships with traders so that they continue to buy from the group continuously even in the future.
- Improve quality of products (Because the group has to build a relationship with traders, it will work at having uniform quality from all the members so as to encourage traders to continue buying from them.)

How to do the marketing in groups

The best guide for marketing in groups is using the 5 Pillars of marketing to help in planning. (*Refer to Topic 1*).

The group can choose to carry out its marketing by choosing any of the forms below:

- The group develops a market linkage with traders in the villages who supply wholesalers. The wholesalers might be suppliers in urban markets, schools, hospitals, etc.
- The group identifies retailers in the local market or on the roadside who they would supply from time to time.
- One or more members of the group can decide to become retailers and will sell the sweet potatoes of the group members.
- The group can establish a selling point in the market or roadside and they take the responsibility of supplying sweet potatoes to that kiosk.
- The group makes a contract to supply a school, hospital, etc and then get paid as a group. (*Note: the group members must be ready for delayed payments, which usually happens to suppliers of institutions*).

Session thirty

Objective 2: Framers able to sort and grade OSP for marketing

Procedure/steps to guide this session

- Prior to the training, inform participants to bring a few OSP roots of all sizes and varieties as well as damaged roots for the session. All the roots will be put together in a heap.
- Through a brainstorming session, find out what participants know about post-harvest handling, how they have applied it on OSP and other crops and any challenges faced.
- Building on what they have said, give a brief about post-harvest handling, with emphasis to grading and sorting.
- If the number of participants is big, divide them into 2 groups and each group should receive a heap of mixed OSP roots in size and varieties as well as damaged roots.
- In their groups, ask participants to sort the roots and grade them according to what they normally do when going to sell to fellow farmers or markets.
- Ask each group to explain why they graded the roots the way they did. (This will guide in knowing whether they have been practicing it before and whether they appreciate it)
- Note on the blackboard or flip chart the different reasons participants give for the grading they have done. Discuss further to make sure they bring out grading according to size, variety and damaged roots. (Use the Promoter training poster on the page showing grading and sorting as well as the page on selecting roots for the market to emphasize learning.)
- At the end of the session, get 5 participants to tell the group what they have learnt which they will do differently before marketing their OSP next season.

- Wrap up with key message, “*In order to bargain for a good price, grade and sort your OSP roots*”.

Topic 4: Making Products from OSP

Introduction

Value addition is the process of improving the value of a commodity through processing by changing its form, increasing its shelf life or better presentation like packaging. With reference to OSP, crushing, cooking, chipping and extracting juice are some of the forms in which OSP can be consumed or sold. Value addition in OSP is important in that: (a) increases income through the products which are of a higher value than the OSP roots; (b) improves storability especially after chipping to reduce bulk then drying the chips; (c) give a new or different taste to the food; (d) eases transportation because dried sweet potatoes are not bulky; (e) improves presentation through changing packaging like for porridge flour. In adding value to OSP caution should be taken not to adversely reduce the vitamin A (nutritional value). The general aim of this topic is to let participants know that there are many other different ways in which we can consume and sell OSP besides the fresh/cooked roots

Objective: Participants should get basic knowledge and skills that will enable them make products from OSP for both home consumption and income generation

Materials: charts showing the different products made out of OSP and how the products are made; samples of OSP roots

Time: 2 hours

Session thirty one

Objective: *basic knowledge and skills to make products from OSP for both home consumption and marketing*

Procedure/steps to guide this session

- Inform participants prior to the training to bring some fresh OSP, firewood, saucepans and bowls, sugar, wheat flour, baking powder, bananas, salt and cooking oil.
- Give a brief about the importance of value addition for farmers. Remind them that the training initiates them into business thinking; therefore, they have to avoid overspending.
- During the training, find out from participants about what they know or could have heard about making OSP products. Explain to them that they will make products like doughnuts, pancakes and chapattis using raw and cooked OSP roots.
- Divide the participants into groups of 3 – 4 people to allow participation of each member in the practical training and give each group a product to make.
Use the recipes at the end of this section to guide the groups in making the products.
- Remind the groups to write down the cost of all the ingredients used in making their products as well as firewood. (*Note: Estimates will be used if the quantities of the ingredients are small*). Ask them to sum up the costs involved in preparation.
- After cooking, each group should count the number they have produced for the product they made. Using consideration of the usual price in the shops let them give a selling price for a piece and then calculate the total income they expect from their business. (*Price for a piece multiplied by number of pieces for sale is equal to total income*).

- Guide each group in subtracting total cost from total income to give them the profit they have made
- Ask a representative of each group to give a presentation of how their business fared. Encourage them to highlight any successes or challenges faced and any solutions they identified while they carried out their business. The group can give their perspective of the kind of profit or loss they expected. (*Note: sometimes group members eat the product while cooking, hence, reducing the number they have at the end and subsequently, the total income they would make*)
- From the presentations, ask participants which OSP products they feel they can manage to make as individuals or in groups without any assistance from the project and which ones can be easily sold in their locations like schools or in the trading centers.
- Emphasize to participants that if they are making OSP products for the market, they should not eat while cooking because it reduces their profits. While making products, they can set the number for sale and make some for home consumption hence it will prevent them from eating what they have prepared for the market.
- Encourage the groups to share the products they have made with all participants
- End the session with a key message, “***For improved nutritional value and incomes, add OSP in your products***”.

Some reference notes: Products made using OSP roots

Doughnuts

Ingredients: 2 tumpeco mashed sweet potato, 4 tumpeco baking flour, 4 teaspoons baking powder, 4 dessert spoons sugar, salt, 4 dessert spoons of heated oil, lemon rind and juice, Cooking oil

Procedure

- Boil sweet potatoes and mash
- Mix flour with the mashed sweet potatoes until well-mixed, then add baking powder.
- Add the sugar, heated oil, lemon rind and juice into the mixture.
- Add water gradually and knead the dough properly.
- Cover the dough with a cloth and put out in the sun for 15 to 20 minutes (Helps the dough rise faster)
- Roll on a board and cut into round shapes using a cup or glass. Put a hole in the middle using a finger or soda bottle
- Deep fry to golden brown
- Remove from pan and cool



Chapatti

Ingredients: 1 cup mashed OSP, 2 cups wheat flour, 2 teaspoons salt, water, cooking oil

Procedure:

- Boil and mash the sweet potatoes
- Mix flour and salt
- Add the mashed sweet potatoes
- Add oil and make a dough
- Add small quantities of water gradually until the dough does not stick on hands or spoon.
- Pick small pieces of dough and roll on a board
- Fry the chapatti on one side and turn until they are golden brown
- Serve with tea or sauce



Pancakes

Ingredients: 1 cup mashed OFSP, 1 cup sweet potato flour, 3 cups cassava flour, 1 cluster of apple bananas and cooking oil

Procedure

- Peel the apple bananas and mash them.
- Peel the sweet potato roots, boil and mash them
- Mix the mashed bananas and sweet potatoes
- Add the mixture of cassava and sweet potato flour gradually.
- Knead the dough until it does not stick on the hands
- Cut with a small cup
- Deep fry in cooking oil until brown and remove to cool.

