# Curing and Storage

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SWEETPOTATO ACTION FOR SECURITY AND HEALTH IN AFRICA

# Improved Curing for Improved Shelf-life

## SSA Research Findings Update

## Uganda, 2012 + 2013

# On-farm Demonstrations

HarvestPlus
Better Crops • Better Nutrition

SASHA
Sweetpotato Action for Security and Health in Africa

## Uganda, 2012 + 2013

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# Findings

- In-ground curing for 2 – 14 days followed by storage (open poly bags, 40 days)
  - 3 days best (17% wt loss vs all shrivelled)
  - 14 days roots sprout
- Dry sand storage without curing, effective
- Saw dust worked in 2012, but not 2013
- Varietal differences in curing + sprouting

# Breaking Postharvest Bottlenecks: Long-term Sweetpotato Storage in Adverse Climates

Project Funded by USAID OFDA and implemented by CIP and CRS in partnership with various

# Overview

- USAID-OFDA support
- 18 month project, Ghana and Malawi
- Strategic objective: Ensure that sweetpotato producers have access to appropriate storage techniques for extending sweetpotato shelf-life (reducing postharvest losses) for household consumption and commercial sales

# Project Design

- A community-based, participatory and gender-sensitive approach to the design and implementation of the effort is used, drawing on the best current knowledge of sweetpotato management before and after harvest.  Activities of the project are structured around four “intermediate results”(IR):
- IR1. Site selection and participatory trial design is completed
- IR2. Storage trial participants and community members are trained in good crop management, harvesting, sorting and handling practices
- IR3. Producers successfully store sweetpotato roots for home consumption or commercial sales during a six-month period
- IR4. Communities and researchers have jointly evaluated storage options

# Storage concept:
# Potato ventilated pit storage from Afghanistan

## Implemented unsuccessfully at CSIR-SARI

# Seemingly promising technology

## Storage in dry sand till consumed

Implemented 88 hh in 4 communities

# What we did in Ghana

- Project partners met in early Dec, 2013 in Bawku (CRS, CIP, UDS, MoFA)
- Identified 4 villages
- Conducted “baseline” survey – Key indicators, current storage time, contribution of sweetpotato to income and consumption (report of findings languishing)
- Sand storage trials conducted in 4 communities using available sweetpotato – Obaare WFSP, mainly
- On-station storage pit effort – mismanaged.
- Instrumentation/measurement – rather inadequate

# Planning 2014 season in Ghana

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# What we did in Malawi

- Project partners met in early Dec, 2013
- Identified project sites
- Conducted “baseline” survey – Key indicators, current storage time, contribution of sweetpotato to income and consumption (report of findings languishing)
- Planned trials and grew sweetpotato for them – primarily OFSP
- Implemented trials in May, 2014

# Breaking postharvest bottlenecks: Long-term sweetpotato storage in adverse climates

***"PROGRESS IN MALAWI"***

SPHI

Sweetpotato for Profit and Health Initiative

ERNA ABIDIN & team
Malawian team: CIP, CRS, Mzuzu-CADECOM

**A USAID-OFDA Disaster Reduction Research: On-farm Sweetpotato Storage in Ghana and Malawi**

## Implementing organization and Project area:

- International Potato Center (CIP)
- Catholic Relief Services (CRS)
- Catholic Development Commission based in Mzuzu, North Malawi (Mzuzu-CADECOM)
- Three farmers' communities in Central and Northern Region of Malawi:
  - Zombealaki, Kasungu District: *S12$^{o}$ 24.684'; E 033$^{o}$ 24.666'; 1,176 m asl*
  - Chizerema, Kasungu District: *S 12$^{o}$ 30.361'; E 033$^{o}$ 26.211'; 1,252 m asl*
  - Champira, Mzimba District: *S 12$^{o}$19.863'; E 033$^{o}$ 35.531'; 1,445 m asl*

  These communities are under the supervision of CRS-CADECOM

# Strategic plans

- Identifying the key individual farmers.
- Getting an appropriate numbers of farmers.
- Refreshing the knowledge and skills of the NGOs and government extension and the farmers on sweetpotato production management, postharvest handling, and processing and utilization.
- Training on the data collection and management (extension & farmers).
- Setting up the trial at harvest and data collection.

# TRIAL SET UP

- 3 villages/sites in 2 districts
- 3 replicates per village
- 3 storages:
    - Afghanistan ventilated pit storage
    - Ladder pit storage
    - Granary
- 2 types of sweetpotato:
    - Local varieties (white and yellow flesh)
    - OFSP (Zondeni)

# Data Collection

**Test of consumer acceptance at**

0 month: mid May 2014
1.5 months,  end of June
3.5 months, end of Aug 2014
7 months, end of Nov 2014

**Test on market orientation:**

**End June 2014** during the peak sweetpotato harvest period
**End Nov 2014** where the sweetpotato is scarce

**Test on Beta-carotene for OFSP varieties:** End of June and End of November 2014

**Temperature and RH are measured using HOBO at each observation**

## What we have done at pre-trial?

Trained farmers on negative selection for SPVD and pest incidence in March 2014

**Trained farmers on Processing and Utilization in May 2014:**

Increase of knowledge on OFSP utilization and processing

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## What we have prepared?

**Mandazi,**
**Juices (leaves and roots),**
**One-pot meal**

(at least 3 food groups in a dish based on National Nutrition Policy guideline)

# Number of participants

| District | Site & EPA | Men | Women | Total |
|---|---|---|---|---|
| **Kasungu** | Chizelema- Kaluluma EPA | 17 | 15 | 32 |
| | Zombealaki –Kaluluma EPA | 5 | 18 | 23 |
| **Mzimba** | Njomani – Champhira EPA | 7 | 19 | 26 |
| **Total** | | 29 | 52 | 81 |

# Data collected at harvest

| Site | Yield Estimate Plot (kg/4 m²) | | Yield (t/ha) | |
|---|---|---|---|---|
| | Local | Zondeni | Local | Zondeni |
| Champira | 6 | 24 | 15 | 60 |
| Zombealaki | 4 | 12 | 10 | 30 |
| Chizerema | 6 | 12 | 15 | 30 |
| Average | 5.3 | 16 | 13.3 | 40 |

# Treatments

**Afghanistan**
**Ventilated Pit Storage**

Size: 2x1x1 m
Number of roots: 200 roots
Weight:
Local: 34 kg; Zondeni: 35.8 kg
No dry sand

# Ladder Pit Storage with “dry” sand

Size: 0.6 x 0.6 x 0.5 m
Number of roots: 200 roots

Weight:
Sand: 40 kg
Roots: Local: 29.9 kg
Zondeni: 28.3 kg

# Granary covered by clay-cement with “dry” sand



Size: Height: 1 m and Diameter: 1 m
Number of roots: 100 roots
Weight:
- Sand: 400 kg
- Roots: Local: 16.7kg; Zondeni: 34.5kg

# Preliminary Results

## Temperature and Relative Humidity (RH):

**Granary:**

Local varieties: 1st observation: 25.3°C, RH: 46.1%; 2nd Observation: 27.7°C, 36.3%;
Zondeni: 1st observation: 25.3° C, RH: 47.4% ; 2nd Observation: 27.5°C, RH: 37.1%

**Ladder Pit storage:**

Local varieties: 1st observation: 25.1°C, RH: 52.1%; 2nd Observation: 25.1°C, 45.3%
Zondeni: 1st observation: 25.3° C, RH: 51.4% ; 2nd Observation: 26.1°C, RH: 50.3%

**Afghanistan pit Storage:**

Local varieties: 1st observation:24.8°C, RH: 59.9%; 2nd Observation: 26.7°C, 45.5%
Zondeni: 1st observation: 23.7° C, RH: 65.7% ; 2nd Observation: 26.8°C, RH: 47%

- We have done the sensory observation twice but we need to do one more observation in Nov for getting an accurate result.
- Shriveled, sprouting, rotten, bad smelling, sweetpotato weevils damage and reducing weight were recorded and we need one more observation, thus data are yet to be analyzed.
- Rats and termites are the serious problem for Afghanistan pit storage while termites are found to be a problem for Ladder pit storage. Some replicates do not have roots any more from the Afghanistan pit storage for the last observation in Nov.

# Thank you very much for you  attention

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