



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

*“PROGRESS IN MALAWI”*



**Sweetpotato**  
**Profit and Health**  
**Initiative**

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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:  $S 12^{\circ} 24.684'$ ;  $E 033^{\circ} 24.666'$ ; 1,176 m asl
    - Chizerema, Kasungu District:  $S 12^{\circ} 30.361'$ ;  $E 033^{\circ} 26.211'$ ; 1,252 m asl
    - Champira, Mzimba District:  $S 12^{\circ} 19.863'$ ;  $E 033^{\circ} 35.531'$ ; 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



# What we have prepared?

SPHI



**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
<b>Kasungu</b>	Chizelema- Kaluluma EPA	17	15	32
	Zombealaki –Kaluluma EPA	5	18	23
<b>Mzimba</b>	Njomani – Champhira EPA	7	19	26
<b>Total</b>		29	52	81

# Data collected at harvest



Site	Yield Estimate Plot (kg/4 m <sup>2</sup> )		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

Zonden: 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: 1<sup>st</sup> observation: 25.3°C, RH: 46.1%; 2<sup>nd</sup> Observation: 27.7°C, 36.3%;  
Zondeni: 1<sup>st</sup> observation: 25.3° C, RH: 47.4% ; 2<sup>nd</sup> Observation: 27.5°C, RH: 37.1%

### Ladder Pit storage:

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

### Afghanistan pit Storage:

Local varieties: 1<sup>st</sup> observation: 24.8°C, RH: 59.9%; 2<sup>nd</sup> Observation: 26.7°C, 45.5%  
Zondeni: 1<sup>st</sup> observation: 23.7° C, RH: 65.7% ; 2<sup>nd</sup> 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

