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Standard Operating Procedure for Harvesting and Post-Harvest Tuber Management in Yam

Authors & Contributors:
Oluchi Odom-Kolombia O.Odom@cgiar.org
Theresa Olusola T.Olusola@cgiar.org
Kabiru Ganiyu K.Ganiyu@cgiar.org
Olatunji Adenike AA.Olatunji@cgiar.org
Alex Edemodu A.edemodu@cgiar.org
Olugboyega Pelemo O.Pelemo@cgiar.org
Agre Paterne P.Agre@cgiar.org
Amele Asrat A.Amele@cgiar.org

1. Introduction

The tuber is the food organ and the essential part of the yam plant. Evaluations and selection are premised on this economic part, just like in other root ad tuber crops. The dormancy period and the dry spell which succeeds harvesting necessitates storage. This storage spans 3-5 months, a time sufficient for significant tuber loss, especially in damaged tubers. Therefore, tuber harvest and post-harvest management are critical to avoiding these losses occasioned by tuber damage at harvest and tuber quality reduction due to long-term storage. Timely harvesting ensures the quality of tuber in storage and quality data which is critical to the yam breeding scheme. Tubers are usually harvested

when senescence is above 75%. A successful selection process is hinged on timely and effective harvesting of tubers. Avoiding damage during harvest prevents rot and ensures adequate shelf life, i.e., a sufficient period spanning harvest till replanting

2. Purpose

To describe the flow of activities in yam harvesting and post-harvest operations.

3. Scope

This SOP covers manual yam harvesting and tuber storage.

4. Definition of terms

5. Roles and Responsibilities

Scientist

- Allocate resources for harvesting and post-harvesting activities
- Discuss and approves harvesting plans with the team
- Coordinate the visual tuber selection process

Research Associate/Manager

- Plans and ensures availability of all logistics and resources (including labour, tools, materials etc.) required for harvesting and post-harvesting activities.

- Prepare schedules and allocate trials to different sub-teams for harvesting and post-harvest activities
- Coordinate all harvesting and post-harvesting activities
- Participate in varietal/progeny selection with the lead scientist

Supervisor/Technician:

- Ensures the daily availability of items and personnel's required for each of the trials

- Leads (Identify the orientation of the field) and supervises the harvesting and post-harvesting operations
  - Ensures proper compliance to all risk management rules before, during and after harvesting operations to mitigate personal injuries.
  - Guides and ensures the digging out of yam tubers with minimal to zero damages
  - Guides careful and sequential packing of harvested tuber
  - Participate in harvest and post-harvest data capturing following the data collection SOP
- Guides and ensures careful loading and off-loading of harvested tubers

Field workers:

- Carry out the harvesting operation by carefully digging tubers from the soil
- Pack the harvested tubers into allotted baskets and net bags on the plots

- Assist in data capturing.

6. Procedure/Protocols

6.1 PRE-HARVEST OPERATIONS

Before the commencement of the harvesting, the following must be ensured:

- Every implement and materials needed for harvesting must have been made available before the start of harvest, e.g., boots, hats, nets, hoes, digging rod, cutlass barcodes labels or paper tags, pencils, pen, notebook, tablets, sharpie marker etc,
- All tags must be prepared before harvesting; a minimum of four (4) tags is required depending on the number of plants per plot;
- The barcode label should include trial name, name of clone, corresponding plot number and location.
- The plants in the trial must have attained the physiological maturity stage, which is indicated by senescence.
- Estimate the number of man-days needed to finish a trial
- Set up the field book App with the associated harvest traits as state in the data collection SOP
- The barns must be fumigated before harvesting and storage begins.

6.2 HARVESTING ACTIVITIES

- Where necessary, irrigate the field to soften the soil and ease harvesting
- Drop corresponding tags and baskets attached with barcode labels to each plot, spacing each plot following the planting spacing.
- Gently and carefully dig out tubers from each plant from each plot
- Ensure every produced tuber are carefully dug out from each plant before going to the next plant stand
- Each tuber dug out should be left on the same spot after harvesting for data capture as stated in the data collection SOP.
- Tubers must be cleaned of all debris before weighing
- Desired clones are selected and tagged with a ribbon for further evaluation
- Ensure tubers harvested from each plot are parked separately and one after the other to avoid mixture.
- Avoid bruising the tubers when at harvest and during packing.
- Don't fill the basket to the brim to avoid tuber fall-out/mixture during transportation and in storage.

6.3 POST-HARVESTING ACTIVITIES

- Tubers may be sorted by weight for specific purposes e.g. seed for next trials, tubers for food quality assessment etc
- Baskets from a trial should be placed in a pre-allotted space in the yam storage facility

- All selected materials for next season's planting should be well treated with pesticide before storage.
- Rodent baits/ poison and glue should be placed strategically in the barn to minimize rodent damage on harvested tubers.

6.4 PROCEDURES FOR TUBER HARVESTING IN NURSERY

- When senescence is about 80% at 6-8 months after planting, harvest the tubers from the pot using a hand trowel to take out the substrate around the tubers carefully.
- When there is more than one tuber per stand (multiple tubers), one tuber is selected as a representative of that genotype. However, data taken will indicate the information on several tubers per stand.
- Harvested tubers are well-labelled and bagged
- Arrange the harvested tuber by family and store them in the barn
- maintenance tubers in storage by monitoring and removal of rotted tubers, de-sprouting, and preventing of damage to tuber by rodents and insects.

Yam tuber harvested from the pot in the screen house.

Data collection (refer to data collection SOP).

7. References

8. Annex: Forms/Templates to be used for monitoring and data collection