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|   | Crop: Cassava Function: Harvesting and Harvesting Evaluation | SOP # | IITA-CS-SOP06 |
| | | Revision # | IITA-CS-SOP06-01 |
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STANDARD OPERATING PROCEDURE (SOP) FOR HARVESTING AND HARVEST EVALUATION IN CASSAVA



Authors & Contributors

P. Akpotuzor, p.akpotuzor@cgiar.org

P. Iluebbey, p.iluebbey@cgiar.org



T. Ayankanmi, t.ayankanmi@cgiar.org

E. Oke, e.oke@cgiar.org

E. Olaniyo, e.olaniyo@cgiar.org

K. Ogunpaimo, k.ogunpaimo@cgiar.org

S. Andrew, A.ikpan@cgiar.org

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1. Introduction

In cassava breeding, harvesting is carried out to determine the root yield and assess other important traits. It marks the end of the fieldwork for an experimental cassava trial. Cassava field trials should be ready for harvesting 9-12 months after planting. Harvesting is done manually by a team composed of supervisors, technicians, and daily rated staff.

2. Purpose

The purpose of this document is to outline the procedures for harvesting and trait evaluation during harvesting of cassava breeding trials.



3. Scope

This SOP provides a clear guidance on the methods of harvesting cassava breeding trials and accurate data collection during harvesting for correct breeding decisions.

4. Definition of terms

Breeding stages for harvesting in Cassava Breeding Unit Trial:

- Seedling Nursery (SN)
- Clonal Evaluation Trial (CET)
- Preliminary Yield Trial (PYT)
- Advanced Yield Trial (AYT)
- Uniform Yield Trial (UYT)
- Nationally Coordinated Research Program (NCRP)
- On-farm trial (OFT)

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5. Roles and Responsibilities

Supervisor: oversees and manages the team.

- Follows existing protocol for harvesting, based on the objectives of the trial
- Gets a checklist ready for data collection.
- Oversee and coordinate the entire harvesting activities

Research Technicians:



- Assembling all materials needed using the checklist
- Implement data capturing as instructed
- Ensure the accurate labelling of sampling bags.
- Prepares root samples for postharvest evaluation.

Daily rated staffs

- Uproot cassava plants.
- Detach harvested roots from the stalk
- Perform other duties assigned by the supervisor

6.0 Procedure/Protocols

- o Determine the net plot and avoid border plants (NB: this is not applicable to SN and CET).
- o Harvest each plot separately to prevent mix-up.
- o Carefully pull the entire root system out of the ground.
- o Detach roots from the stalk using a sharp machete.

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- o Take all necessary data (characterization: See annex for traits to evaluate during harvesting)
- o For root sampling (refer to SOP for Post-harvest evaluation).
- o Submit data to the data management unit on time.

7. References

I.I.T.A. 1990, Cassava in Tropical Africa: A [reference manual](#) International Institute of Tropical Agriculture. 184 pp

Amponsah, S. K., Addo, A., & Gangadharan, B. (2018). [Review of Various Harvesting Options for Cassava](#). InTech. doi: 10.5772/intechopen.71350



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8. Annex 1 Breeding stages traits evaluation methods



| Breeding stages | | | | | | | |
|-----------------|----------------------------------|--------------------------|---------------------------|---------------------------|---------------------------|------------------|------------------|
| SN | Traits | SN | CET | PYT | AYT | UYT | NCRP |
| 1 | Root shape | NA | NA | Score | Score | Score | Score |
| 2 | Root number | NA | Count | Count | Count | Count | Count |
| 3 | Root size | NA | NA | Score | Score | Score | Score |
| 4 | Dry matter | Hand feeling/oven-drying | Specific gravity/Oven dry | Specific gravity/Oven dry | Specific gravity/Oven dry | Specific gravity | Specific gravity |
| 5 | Field TC | TC chart | TC chart | TC chart | TC chart | TC chart | TC chart |
| 6 | Root weight | NA | Weight | Weight | Weight | Weight | Weight |
| 7 | Shoot weight | NA | Weight | Weight | Weight | Weight | Weight |
| 8 | Number of plants stand harvested | NA | Count | Count | Count | Count | Count |
| 9 | Ease of peel | NA | Score | Score | Score | Score | Score |
| 10 | Passport photo | NA | Imagery | Imagery | Imagery | Imagery | Imagery |
| 11 | Neck length | NA | NA | Score | Score | Score | Score |
| 12 | Outer color | NA | NA | Score | NA | NA | NA |
| 13 | Inner color | NA | NA | Score | NA | NA | NA |
| 14 | Pulp color | NA | score | Score | Score | Score | Score |

TC: total carotenoid; NA: not applicable

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9. Annex 2: Trait classification for data collection at harvest

| S/N | Trait | Score | Remark |
|-----|---------------------------------------|--------------------------|--|
| 1 | Number of plants harvested (net plot) | Count | Number of plants harvested and counted |
| 2 | Root number | Count | Number of roots harvested and counted |
| 3 | Root weight (kg) | Weighing | Fresh weight of harvested tubers |
| 4 | Shoot weight (kg) | Weighing | Shoot fresh weight (stem and leaves) |
| 5 | Root size | Visual | 3 = small, 5 = medium, 7 = large |
| 6 | Root shape | Visual | 1 = conical, 2 = conical-cylindrical 3 = cylindrical, 4 = irregular |
| 7 | Outer skin color | Visual | 1= white or cream, 2 = light brown, 3 = dark brown |
| 8 | Inner root skin color | Visual | 1=white, 2 = cream, 3 = yellow |
| 9 | Pulp color | Visual | 1 = white, 2 = cream, 3 = yellow |
| 10 | Ease of peel | Textural | 3 = easy to peel, 5 = moderately difficult 7 = difficult to peel |
| 11 | Root neck length | Visual | 0= absence, 3 = short, 5 = intermediate, 7 = long |
| 12 | Number of rotted tubers | Count | Actual number of rotted tubers |
| 13 | Pound ability | Handfeeling/penetrometer | 0= not poundable, 1= slightly, 2= poundable, 3= very poundable |
| 14 | Taste | Sensation | 1= sweet, 2= bland, 3= bitter |
| 15 | Color of boiled root | Visual | 1= white, 2= cream, 3= yellow, |

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Materials and Supplies

Weighing Scale



Phone Tablets with barcode scanner and power bank



Markers



Ribbon



Knife



Cutlass





Paper envelope



Sisal rope



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