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SOP Owner	Lead Breeder (Amele Asrat)	Approval Date	22-08-22

Standard Operating Procedure for Establishment of Yam Seedling Nursery

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1. Introduction

Seedling nursery involves the raising and management of seedlings from botanical seeds for the purpose of progeny or population development. This is a major stage that succeeds pollination in the yam breeding pipeline. A proper understanding of yam seeds and how to raise them at the seedling stage is critical to a successful hybridization scheme in yam.

2. Purpose

This serves as a guide on handling yam botanical seeds for the generation of yam tubers. It Standardizes seedling nursery activities to achieve optimum germination and raise healthy hybrid progenies in yam

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3. *Scope*

The SOP will cover tuber generation from botanical yam seed. The activities to focus on will include seed extraction, seed tray, substrate preparation, seedling transplanting and maintenance, harvesting and data collection under screen house conditions.

4. *Definition of terms*

IITA	International Institute of Tropical Agriculture
TDa	Tropical Dioscorea alata
TDr	Tropical Dioscorea rotundata
NARES	National Agricultural Research and Extension Services
SAH	Semi Autotrophic Hydroponics
SOP	Standard Operating Procedures

5. *Roles and Responsibilities*



Crop Lead/Scientist

- Determine the number of progenies to be sown per family
- Set criteria for selection at the vegetative and tuber harvesting stage
- Determine the number of progenies to be advanced per family

Manager

- Ensure needed materials and personnel are timely provided
- Liaise between the Supervisor/technicians and the crop lead for efficient execution of activities
- Summarize and report the performances of each family

Research Supervisor

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- Overall supervision of seedling nursery management (fertilization, fumigation and trailing)
- Provides data collection templates,
- Ensures proper mixing ratio of the substrate and proper fertilizer application
- supervise tuber harvesting and data collection process



Technicians/Field workers

- Carry out seed sowing
- Assist in seedling transplanting and management,

6. Procedure/Protocol

6.1 Seed Sowing

- Select seeds of the families to be used in population development
- Procure substrate to be used for seed sowing
- Obtain seed tray and make sure they are cleaned thoroughly
- Fill the seed tray with the moist substrate and arrange them properly in the screen house.
- Label the seed trays accordingly
- Sow the seed by placing them on the substrate and use fingers to press them into a depth of about 2-3cm
- Label the seeds with the family code, number of seeds sown per family and peg number
- Monitor the seeds daily and water them as needed
- Set up the field app for data collection and activate needed traits
- Take daily germination count per family using the field app.

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- Coloured thump pin is used to identify counted seedlings





Yam seedling with thump pins used for germination count

Data to be collected: Date of seed sowing, number of seed sown, Date of seedling emergence, Number of seedlings per family

6.2 Pre-nursery Operations

Transplanting and Nursery Maintenance

- Transplanting is done at 6-8 weeks after seed sowing, depending on the specie
- Mix sterilized topsoil and cocopeat at a ratio of 2:1, respectively, and fill same into the pots
- Arrange the pots in the screen house, water them and allow water percolation overnight
- Select healthy and vigorous seedlings and screen out weak and diseased ones
- Carefully remove the seedling from the tray, transplant, and ensure no damage is done to the root
- Water slightly to firm the soil to the root of the transplanted seedling
- Label each family appropriately

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- Place foot dip containing 3% cypermethrin aqueous solution at the entrance of the screen house and replace it as needed.
- Trail yam vines with the use of cotton and iron ropes
- Daily maintenance includes hand weeding, watering as required, proper control of insect pests using appropriate insecticide solution

Data to be collected: plant vigour, Yam Anthracnose disease and Yam Mosaic Virus

7. Reference

Norman, P.E.; Danquah, A.; Asfaw, A.; Tongoona, P.B.; Danquah E.Y.; Asiedu **2021**, R. Seed Viability, Seedling Growth and Yield in White Guinea Yam. *Agronomy* 11, 2. [https:// dx.doi.org/10.3390/agronomy11010002](https://dx.doi.org/10.3390/agronomy11010002)

8. Appendix
