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Standard Operating Procedure for Yam Trial Management

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1. Introduction

Yam trial management involves all the activities implemented throughout the life cycle of a yam trial/experiment, either in the field, screenhouse and laboratory, following a well-coordinated plan to achieve high-quality data. The activities are carried out by different personnel across all the growth stages, from planting to harvest, in consonance with other SOPs.

2. Purpose

This SOP aims to ensure appropriate and timely execution of all relevant activities, from the trial establishment to the harvesting of tubers.

3. Scope

This standard operating procedure (SOP) covers the time of trial establishment to harvest, including handing over the field to the Research Farm Unit (RFU).

4. Definition of terms

Experiment/Trial: Experiments are designed to test or generate germplasm for specific qualities or to observe the performance of existing germplasm. Experiment and trial are used interchangeably in this document.

Trait list: Group of traits to be evaluated in an experiment.

Staking: provision of support to the yam vines. This enhances tuber yield due to higher exposure of plants to photosynthetic activities and facilitates vegetative phenotyping.

Earthing-up or re-mounding: Rebuilding the washed-down ridges or mounds by erosion. It is usually carried out during weeding or as a special maintenance activity where the effect of erosion is heavy.

Vine Trailing: The guiding of vines of yam to avoid the intertwining of different genotypes in the field.

Weed: unwanted plant in a trial plot/field

5. Roles and Responsibilities

Crop Lead/Scientist: Responsible for the overall design and management of the Trial and for delegating team responsibilities.

Research Associate/Manager: Performs the following tasks:

- Assist the scientist in the design of all trials

- Ensure availability of appropriate field books and layout
- Ensure and monitor the establishment field/screenhouse trials according to field layout/designs
- Ensure the availability of all logistics required for all activities across the trial stages
- Pre-activities schedule/plan for timely execution of all trial management activities
- Ensure timely implementation/execution of activities across trial stages
- Receives instructions and provides regular updates/reports on the trialling activities to the scientist

Supervisor/Technician: It's the responsibility of the Supervisor/Technician to:

- Make available every material needed on the field for specific trial planting using the checklist.
- Carry out Field marking and layout operations
- Implement the planting activities
- Ensure the plots are correctly labelled.
- Ensure all the trials are correctly identified with a signpost
- Ensure application of herbicide between 1-5 DAP.
- Ensure staking of trials after 3 -6 WAP
- Ensure weed control of the field till harvest.
- Ensure application of recommended fertilizers and recommended rates
- Carryout harvest operations following the harvesting SOP
- Ensure accurate collection of all planting, pre-harvest, harvest, and post-harvest data based on data collection SOP
- Ensure field evacuation and handing over to RFU

Sprayers: Ensures the application of recommended herbicides/insecticides at an appropriate rate on the newly established field and screen house trials, including kitting with all personal protective equipment (PPE). Report completion of spraying operation of a trial to the supervisor.

Signboard Writer: Is responsible for writing the signboard's trial information and placing the board on the field under the supervisor's guidance. Remove signboard, pegs, and other labels from the field after the end of trials as instructed by the supervisor.

Field Workers: The field workers assist in the following tasks:

- Field trial establishment
- Staking of plants
- Trial maintenance such as weeding, earthing up of ridges and mounds and trailing of vines
- Harvesting
- Executing post-harvest activities

Laboratory Technician: The Lab technician assists in the following tasks:

- Establishment of experiments and trials in the laboratory.
- Tuber sampling and evaluation for dry matter, sensory, RVA, and polyphenol evaluation.
- Carrying out lab activities such as maintenance of the laboratory.

6. Procedure/Protocols

6.1 General protocols to observe

- Provide trial establishment SOPs for the supervisor/technician to follow.
- Ensure availability of relevant planting materials and logistics, including a suitable site.

- Ensure the correct marking and field layout of trials.
- Ensure the planting materials (seed yam) are laid and planted incorrect orientation according to the field plan/layout.
- Ensure proper labelling of the plots.
- Monitor the established trials to verify that clones are correctly assigned according to the field trial design/layout document. Inform the appropriate authority in the event of any change made to the layout.
- Ensure application of the appropriate herbicides at the recommended rate.
- Ensure the staking of plants at the stipulated time.
- Ensure the placement of correct signage.
- Ensure relevant data are collected at the appropriate time
- Ensure the trail maintenance, such as earthing up of ridges or mound, trailing of the vine, etc., is carried out as when due.
- Ensure a weekly visit to the trial site to monitor field conditions and situations for any needed activity.
- Apply fertilizer (NPK 15:15:15) at 200kg/Ha at 3MAP.
- Harvest trials at the appropriate time following harvesting SOP.

6.2 Procedures/practices to be followed to raise a good crop

6.2.1 Planting operation

- Depth/height of ridge or mound must be at least 50 - 100 cm

- Planting spacing of 1-meter intra row (along with ridges/mound = between stands) and 1 meter between ridges (inter-row). This will result in a planting density of 10,000 stands per hectare.
- Planting depth of 15 to 20 cm must be followed to prevent setts from exposure to sun scorching and rodents

6.2.2 Weed control

- Phenotyping and breeding trial plots should be kept free of weeds throughout the crop growth period to ensure optimum crop growth and performance. Weed competition is a severe problem during early crop growth (planting to emergence), which must be controlled with suitable herbicides.
- Apply a combination of diuron (a systemic pre-emergent) and glyphosate (a contact) herbicide for effective weed control. Mix diuron and glyphosate at 2.3 L and 1.8 L per hectare rate.
- Application should be done no later than 7sevendays after planting (DAP) the yam. Subsequent manual weeding at least twice should be applied to further control weeds in the trial plot.

6.2.3 Earthing-up or Re-mounding

This activity is required to provide an optimum soil environment for adequately developing the roots and tubers and is usually done during weeding. Still, excessive root and tuber exposure due to heavy rains or rodents must be done separately using hoes.

6.2.4 Staking and Trailing

Yam is a climber and may require proper staking depending on the agroecology for optimum crop growth and performance. Depending on the trial objective, a variety of

trials could be conducted with or without stakes. If the trial is supposed to be staked, a proper trellising method should be applied to reduce the stakes required for the trial area.

- Staking is usually done about a month after planting when 90% of the sprouts would have emerged in a plot.
- Use locally available bamboo sticks or other material or PVS pipes of uniform height (2−3 meters).
- Regular guiding and training of the yam vines (particularly lateral branches) to the stake must be carried out at least twice a week for proper twining during the plant's active growth.

7. References

(https://yambase.org/tools/onto/)

8. Appendix