

GHANA



STANDARDS AND INSPECTION PROCEDURES

This protocol is part of the project framework and represents one of the outputs / outcomes of the CIP-led project "Jumpstarting orange-fleshed sweetpotato in West Africa through diversified markets." Tested and executed in 2016, the protocol can be used for anybody who intends to commercialize the sweetpotato planting materials.

QUALITY DECLARED PLANTING MATERIALS (QDPM)



Promouvoir
la patate douce à chair
orange en Afrique de
l'Ouest à travers des
marchés diversifiés

Jumpstarting OFSP

Project Manager,

Dr. Erna Abidin

Email: p.abidin@cgiar.org



1

OVERVIEW

- **Sweetpotato** is an important root crop; in Ghana it ranks fourth after cassava, yam, and cocoyam
- Propagated asexually by storage roots (subsequent sprouts to give new plants) and by vine cuttings (forms roots at the nodes producing daughter plant); the crop is produced sexually from seed (strictly for breeding purposes)
- Vine productive rate estimate is 1–15 to 1–20
- Wide range of pathogenic organisms attack sweetpotato plants, including virus, nematode, fungi, and bacteria
- **Insect pests:** weevils, caterpillars, white flies
- Agronomic practices: propagated from vine cuttings (tropics)
- Apical cuttings (25–30 cuttings/at least 4-node cutting)
- Planted on ridges, mounds, and flats, depending on the nature of the soil and purpose of planting
- **Plant spacing:** 30 x 100 cm (root production); 10 x 20 cm (rapid multiplication); and 20 x 30 cm (vine production)
- **Weeding:** 4 weeks, depending on the intensity of the weed
- **Fertilizer application:** NPK 40:40:70 kg/ha, or 10 t/ha of organic manure (root production); 13 g/m² of urea, or 2.5 kg/m² of organic manure (vine production)
- Vine harvesting occur at 8–10 weeks after planting (WAP) for first harvest and every 4 weeks thereafter
- Roots are harvested at 12–16 WAP, depending on variety
- Root postharvesting activities include curing and storing

2

JUSTIFICATION FOR QUALITY DECLARED PLANTING MATERIAL (QDPM)

Traditionally, farmers source planting materials from friends and neighbors. This translates into dissemination of low-quality planting materials and the transfer of disease-infected planting materials. Hence, there is a need to develop a way that will guarantee a system for dissemination of quality planting materials.

The QDPM process has been developed to guide the production of clean, disease-free planting material of reproduced crops. Its overall goal is to raise the physiological and phytosanitary quality of the plant reproductive materials available to smallholders and, as a consequence, to increase agricultural production and productivity. It is meant to be implemented primarily by seed producers at community level or by field extension workers. QDPM also guarantees commercialization of seed multiplication at farmer level.

3

REGISTRATION OF QDPM PRODUCERS

The inspection team should approve seed producers and register them. To be eligible for registration, a seed producer must have:

- Access to seed of an eligible variety suitable for further multiplication.
- Suitable land for quality declared seed (QDS) production.
- Access to a reliable source of water.
- Basic knowledge of seed production technology in order to supervise and exercise quality control over production. The scale of seed production should be to an extent that allows efficient management. The inspection team may refuse to register a QDS producer when there is evidence that he/she is not suitably qualified.

QDPM should be produced by a registered seed producer/decentralized vine multiplier (DVM)/nongovernmental organization who will be responsible for the quality of the seed. Quality control measures should include:

- Ensuring that the production fields have satisfactory cropping histories, and that the seed to sow the fields is eligible to produce QDS
- Ensuring that the variety is well known, and arranging remedial measures to be undertaken, such as rouging, as may be necessary
- Inspecting the seed fields according to the appropriate crop standards and procedures, and ensuring that only those that meet the standards are approved (see Table 1)
- Ensuring that the identity of the seed at harvest is maintained
- Keeping records of all activities and inspections
- Selecting an appropriate location (isolation site)
- Establishing a cropping history; this should be done before planting the seed
- Be at least 50 m from existing farms; however, owing to land tenure challenges, non-host crops could be planted as border crops.

Pictorial Representations of Standards

Top: Vines showing no signs of sweet potato virus disease (SPVD); **bottom:** Plant shows signs of SPVD

HEALTHY
PLANT

DISEASED
PLANT (SPVD)

Variety must be true-to-type—that is, same as delivered by research centers

Cultivar mixture: none

No weevil-infested vines (avoid using old vines/vines 15 cm below base)

4

INSPECTION PROCEDURES

- **Field visit:** conduct a pre-visit (i.e., reconnaissance visit) of the farm, to have the history of the farm land
- **Field labeling:** variety planted/date
- **What time do we visit the farm after planting?** 6 WAP: If the field is believed to be infested, it would have appeared. In the event of infestation, any diseased plant is discarded
- **Second visit:** 8–10 WAP or at harvest
- Vines are ratooned at 10 WAP
- Second vine harvest is about 4 weeks after the first harvest
- DVMs should not sell vines until the field is certified and a certification number provided by the inspection team
- DVMs must properly label all the vines to be sold
 - The label must contain:**
 - Variety
 - Multiplier
 - Telephone number
 - Date of harvest
 - Number of cutting
- Inspection should be repeated before the second harvest (see Table 2)
- Vines should be harvested no more than twice on a particular plot



The quality declared sweetpotato planting materials should be marked by a valid label.

Table 1: Checklist of activities for each inspection visit

Checklist for Visit	1st Visit (6 WAP)	2nd Visit (10 WAP)
Notification of visit and logistical arrangements	Yes	Yes
Assessment of site location	Yes	No
Sampling of beds & assessment of quality parameters	Yes	Yes
Completion of scoring sheet	Yes	Yes
Preparation and submission of summary report	Yes	Yes
Notification of multiplier of recommendations	Yes	Yes

5

TERMINOLOGY

5.1 MULTIPLICATION TECHNIQUES

- **Primary multiplication:** This is mostly done by a research institution/organization. The main aim is to produce initial planting materials (foundation seed) for DVMs. It is usually multiplied under screenhouse, net tunnel, or in open field. Close spacing (10 x 20 cm) is used here for rapid multiplication. Vine cuttings are usually 15 cm long (2–3 nodes).
- **Secondary multiplication:** Vines taken from research institutions/organizations are multiplied, basically with the aim of selling quality vines to the tertiary vine multipliers. Vines harvesting can start at 10 WAP; spacing is usually 20 cm within plants and 30 cm between rows in order to facilitate furrow irrigation. This always involves a large area of land. Vine cuttings are usually 15 cm long (2–3 nodes).
- **Tertiary multiplication:** This is meant for both vines and roots production. Vines are harvested at 90 days after planting when roots are matured. For furrow irrigation, the spacing is 30 cm within plants and 100 cm between rows. Vine cuttings are usually about 25–30 cm long (3–4 nodes).

5.2 INCIDENCE OF PESTS AND DISEASES

- **No incidence:** No plant shows symptoms of caterpillars, weevils, nematodes, purpling, stunting, or leaf curl. The materials are therefore fit to be declared as quality materials.
- **Slight incidence:** A few plants (1–5 out of 100) show symptoms of caterpillars, weevils, nematodes, purpling, or leaf curl. Plants infected are rogued (removed), then materials can be declared as clean.
- **High incidence:** Several (more than 5 out of 100) plants show symptoms of caterpillars, weevils, nematodes, purpling, stunting, or leaf curl. Materials of this type are **not** fit to either be declared as quality planting materials or for distribution.

5.3 CONTAMINATION

- **No contamination:** No viral plant seen; materials are therefore fit to be designated as QDPM.
- **Slight contamination:** Few (1–5 out of 100) viral plants seen. The viral plants are rogued, and the materials can be designated as QDPM.
- **High contamination:** Several (more than 5 out of 100) viral plants seen. Materials are therefore **not** fit to be designated as QDPM.

5.4 MIXTURE

- **No mixture:** No other variety/cultivar is seen in the field. The materials are therefore fit to be designated as QDPM.
- **Slight mixture:** Few (1–5 out of 100) plants of different varieties/cultivar observed in the field. The foreign plants are rogued, and materials can be designated as QDPM.
- **High mixture:** Several (more than 5 out of 100) plants of different varieties/cultivar observed in the field. Materials are therefore **not** fit to be designated as QDPM.

6

REQUIRED TOOLS FOR INSPECTION

Inspection form (see Table 2).

7

OTHER TOOLS

- Measuring tape
- Pegs
- **Inspection tag/ribbon:** Yellow—make corrections; Red—vines should not be sold; Green—certified.

8

SEED ACTS

Part II of the Plants and Fertilizer Act, 2010 (Act 803) establishes the Seed Inspection and Certification Division that is responsible for regulating the seed industry to ensure improved quality seeds. The division supports the production of quality seeds and planting materials. This is achieved through field inspection, training of major stakeholders, laboratory analysis on seed samples, monitoring quality of seed, and seed certification.

Table 2. Inspection Form

SWEETPOTATO Quality Declared Planting Materials (QDPM) – INSPECTION FORM

Time of Inspection:	4 WAP <input type="checkbox"/>	6 WAP <input type="checkbox"/>	8 WAP <input type="checkbox"/>	At Harvest <input type="checkbox"/>
Type of Multiplication:	Primary <input type="checkbox"/>	Secondary <input type="checkbox"/>	Tertiary <input type="checkbox"/>	(check where applicable)
Date of visit				
Inspection carried out by:				
Contact N°				
Region:				
District:	Contact person:		Village:	
Group/individual name:	Contact N°:			
VARIETY:			Date of Planting:	

1

Total land size
(Acre, hectare, or square meter)

2

Number of plants of other varieties in the field

1. No mixture ☐

2. Slight mixture ☐

3. High mixture ☐

3

Number of plants with SPVD symptoms

1. No contamination ☐

2. Slight contamination ☐

3. High contamination ☐

HEALTHY PLANT

DISEASED PLANT (SPVD)



Number of stunted plants

- 1. No incidence ☐
- 2. Slight incidence ☐
- 3. High incidence ☐

4

5

Number of plants with leaf curl

- 1. No incidence ☐
- 2. Slight incidence ☐
- 3. High incidence ☐

6

7

Age of multiplication field (months)

8

Number of plants with signs of weevils

- 1. No incidence ☐
- 2. Slight incidence ☐
- 3. High incidence ☐

Number of plants with signs of caterpillars

- 1. No incidence ☐
- 2. Slight incidence ☐
- 3. High incidence ☐

9

Estimation of quantity of material
(number of cuttings):





The International Potato Center (known by its Spanish acronym CIP) is a research-for-development organization with a focus on potato, sweetpotato, and Andean roots and tubers. CIP is dedicated to delivering sustainable science-based solutions to the pressing world issues of hunger, poverty, gender equity, climate change and the preservation of our Earth's fragile biodiversity and natural resources.
www.cipotato.org



CIP is a member of CGIAR.
CGIAR is a global agriculture research partnership for a food-secure future. Its science is carried out by the 15 research centers who are members of the CGIAR Consortium in collaboration with hundreds of partner organizations.
www.cgiar.org