PRODUCTION AND DISTRIBUTION OF QUALITY SEED SWEETPOTATO

Patrick K. Yegen
Kenya Agricultural and Livestock Research Organization, KALRO – Njoro, P.O. Njoro, Kenya
Introduction

- Sweetpotato (Ipomoea batatas (L.)) is a high value crop – can be produced with minimal inputs
  - Important as food and feed
  - Can be a good commercial crop - source of income
  - Cheap source of carbohydrates and Vitamin A in OFSP varieties
Introduction...

- Productivity low (5-7 tons/ha) compared to potential (30-50 tons/ha)

  - Inadequate access to timely & sufficient quantities of quality planting materials (vines)

  ✓ Seed is the most important of all inputs
  ✓ Quality seed is crucial for high yields
  ✓ Diseased planting materials are vehicles for spreading serious diseases and pests
Introduction...

• Production of good quality Planting materials is therefore critical for high root yield

健康的种子 → 健康的作物 → 健康的根系 & 绿藤

➢ This will improve sustainable root production by the farmers
General Seed flow to producers

In vitro plantlets Produced in TC lab

Foundation and Primary Quality material

Quality Planting Materials Produced by Private vine multipliers

Roots produced by farmers
Draft protocol for formal seed system

- The requirements are derived from the Seeds and Plant Varieties Act, CAP 326 and the Plant Protection Act, CAP 324 as follows:
  - Enable farmers access the best varieties as they become available
  - To prevent the introduction of pests
    Ensure right seeds are offered to the farming community
  - To facilitate safe trade in plant and plant products.
Draft protocol...

- Responsible for:
  - Producing clean source materials (Foundation materials)
  - Maintaining germplasm
  - Introducing new materials
- Private sector responsible for:
  - Mass multiplication
  - Distribution of planting materials to sweet potato producers
General Procedure

- Virus indexing – diagnostic lab
- In vitro plantlets production - TC Lab
- Plantlets transferred to green house for acclimatization (hardening) (2-3 months)
Production of Br, Pb, & B

- Produced using KEPHIS guidelines - isolation distance and spacing
- Done in the primary nursery – in the screen house or field
  - single plants (seedlings) – single rows
  - single rows – single plots
  - Plots - mother blocks
    - Spaced 50 cm by 30 cm
    - Isolation distance is 10m
## Seed classes

<table>
<thead>
<tr>
<th>Seed parents</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breeders (Br)</td>
<td>Progeny of parental stock</td>
</tr>
<tr>
<td>Prebasic (PB)</td>
<td>Progeny of parented stock or certified breeders seed</td>
</tr>
<tr>
<td>Basic (B)</td>
<td>Progeny of certified breeders or certified basic seed</td>
</tr>
<tr>
<td>Certified (CI)</td>
<td>Progeny of certified Pre-basic or certified basic seed</td>
</tr>
<tr>
<td>C2- C4</td>
<td>Subsequent classes of certified basic seed</td>
</tr>
</tbody>
</table>
Rapid multiplication

• A system used to increase planting material rapidly

• Done in beds of 1m by 5m and raised 20cm above ground

• Spacing 20 cm by 10 is used

• Spacing between beds is 50 cm

• Use of minicuttings – 10 cm (3 notes)
Management in the nursery

- Periodically removing weeds by hands
- Checking carefully for any diseased plants and rogueing them out
- Filling any gaps with new cuttings to try and maintain optimum population density of 250 plants per sqm
- Periodically watering if in screen house or when rainfall is not sufficient
• Weeding
• Rogueing-negative selection
• Spraying against pests/weeds
• Fertilization (top-dressing)
• Irrigation; among others
Inspections:

- Done by KEPHIS – at every stage
- Two field inspections are undertaken to verify varietal purity and identity, designated diseases and pests and isolation distance.
  - **1st inspection** done during the early part of the growing season, (approximately 5 - 6 weeks after establishment).
  - **2nd inspection** to be completed before harvesting of roots commences.
## Standards

<table>
<thead>
<tr>
<th>FACTOR</th>
<th>BREEDER SEED</th>
<th>PRE-BASIC</th>
<th>BASIC</th>
<th>C1 – C4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off types</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>1 plant per average count</td>
</tr>
<tr>
<td>Sweet potato weevil</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Stem rot <em>(Fusarium hyperoxysporum f. batatas)</em></td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>1 plant per average count</td>
</tr>
<tr>
<td>Wilt</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Mosaic virus</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Sweet potato feathery mottle virus</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>*Soil rot <em>(Actinomyces ipomoea)</em></td>
<td>70 plants per acre</td>
<td>70 plants per acre</td>
<td>70 plants per acre</td>
<td>140 plants per acre</td>
</tr>
</tbody>
</table>

*A vine crop may be rejected on the basis of serious field infestations by other pests such as nematodes and beetles.*
# Seed labeling

<table>
<thead>
<tr>
<th>Seed Type</th>
<th>Seed parents</th>
<th>Color of labels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breeders (Br)</td>
<td>Progeny of parental stock</td>
<td>White</td>
</tr>
<tr>
<td>Prelatic (PB)</td>
<td>Progeny of parented stock or certified breeders seed</td>
<td>White</td>
</tr>
<tr>
<td>Basic (B)</td>
<td>Progeny of certified breeders or certified basic seed</td>
<td>White</td>
</tr>
<tr>
<td>Certified (CI)</td>
<td>Progeny of certified Pre-basic or certified basic seed</td>
<td>Blue</td>
</tr>
<tr>
<td>C2- C4</td>
<td>Subsequent classes of certified basic seed</td>
<td>Pink</td>
</tr>
</tbody>
</table>
Seed Dissemination and Distribution

- Dissemination
  - To create/raise the demand for seed
  - Have been done through:
    - Agricultural Shows
    - Fielddays/Demos
    - Documentaries
Seed nurseries

- Primary seed nurseries – Research managed
  - KALRO-Njoro, Nakuru County
  - KALRO-Marigat, Baringo County
  - University of Kabianga, Kericho County
  - Lukenya, Machakos County
Secondary nurseries – managed by others stakeholders - ministry, Seed companies, NGOs

- ATC Bomet
- ATC Kericho
- Tarakwai farm (Oletrai), Narok County
Seed distribution