SWEETPOTATO BREEDING IN RWANDA/ AGRA SUPPORT

D. Shumbusha, J. Ndirigwe, L. Kankundiye, P. Rukundo

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Outline

- Background
- Post-release (2014-2016): Dissemination of newly released varieties
- Assessment of farmer preferences (part of PhD study)
- Characterize germplasm (part of PhD study)
- Expected AGRA support/ Breeding proposal

BACKGROUND

- **Opportunities**

Food

Animal feed

Processing

Gender equity

Background (cont'd)

- **Challenges:**
  - No updates about farmer preferred traits, and yet preferences may vary over time depending on the actual utilization
  - No information about the available germplasm

BACKGROUND

Overall breeding objective:

To develop sweetpotato varieties with:

- High yield (roots, above ground biomass)
- Quality traits (mainly DMC, B-carotene)
- Tolerant to pests and diseases
- Suitable for specific or wide adaptation, farmer preferred)

BACKGROUND (CONT'D)

TARGETTED AREAS

Targetted areas are low, mid and high altitudes of Rwanda

Low altitude: Bugesera and Ngoma Districts

Mid-Altitude: Huye, Muhanga Districts

High altitude: Rulindo and Gakenke Districts

1. Dissemination of new varieties

- What next after the official release of new varieties in 2013
  - The released varieties are under dissemination (July 2014-July 2016)

Official release of new varieties

Dissemination thorough net tunnels

Organoleptic tests

DISSEMINATION OF NEW VARIETIES (CONT'D)

- **Objectives:**
  - To increase availability of new varieties
  - To increase awareness of the newly released varieties
  - To create a sustainable sp production and commercialization system (growing calendars, training of sp vine multipliers, etc)

Dissemination of new varieties (cont'd)

- Just after year one
  - 17 vine multipliers identified in Muhanga, Gakenke, Huye, Kamonyi, Rulindo and bUgesera
  - 374,000 clean cuttings produced and distributed
  - The total area covered by distributed cuttings: 8.9 ha
  - Farmers were linked to vine multipliers through awareness creation
  - A sustainable production and commercialization is ensured by the growing calendar established at the beginning of each season

2. PRA

- **PRA: Assess farmer-preferred traits and their implications to breeding new SP varieties in Rwanda**
- Most farmers (>76%) preferred marketable root size
- Most farmers expressed their need to red skin colour
- In Bugesera and Nyagatare, WFSP varieties were preferred than OFSP (DMC)

Sweetpotato preferences depend on the actual utilization

3. Characterization of available germplasm

- Germplasm: 171 accessions
- Morphological and molecular characterization of available germplasm

Based on the level of genotypic variability, parents were selected to be part of a crossing block

4. Progress of SP breeding

- Eight parents selected
- Crosses made in a diallel fashion, half diallel: [1/2P (P-1)]
- Although the focus was on genetic study, both hand and open-pollinated seeds were harvested (OP to be used in our breeding programme)

Fem	1=Ukerewe	2=SPK004	3=K5132	4=4-160	5=RW11-2910	6=2005-179	7=Rw11-1860	8=Waga
1=Ukerewe	X	1x2	1x3	1x4	1x5	1x6	1x7	1x8
2=SPK004		X	2x3	2x4	2x5	2x6	2x7	2x8
3=K5132			X	3x4	3x5	3x6	3x7	3x8
4=4-160				X	4x5	4x6	4x7	4x8
5=RW11-2910					X	5x6	5x7	5x8
6=2005-179						X	6x7	6x8
7=Rw11-1860							X	7x8
8=Waga								X

- A crossing block established at RAB-Rubona centre

CIP Director General visiting the crossing block

Joe DeVries, AGRA PASS Director backstopping us during hand pollination

Germinated seeds after scarification

SWEETPOTATO BREEDING PROGRESS (CONT'D)

- Seeds scarified and germinated by May 2016
- Seedlings from 28 families are being raised in seed nursery at RAB

- Way forward:
  - F1 progenies to be evaluated in 3 locations, 3 reps
  - Data analysis
  - Compute GCA and SCA to determine variance components

Sweetpotato breeding progress

- What next after a series of studies and dissemination of varieties?
  - A breeding proposal was submitted to AGRA

SWEETPOTATO PROGRAMME STAFF

Names	Institution	Discipline	Training level
Jean Ndirigwe	RAB	Sweetpotato breeder	under PhD
Damien Shumbusha	RAB	Sweetpotato breeder	under PhD
Placide Rukundo	RAB	Sweetpotato breeder	PhD holder
Lydie Kankundiye	RAB	Agronomist	MSc
Anastasie Musabyemungu	RAB	Extensionist	Under MSc
Aloysia Musabyimana	RAB	Technician	BSc

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