

# Sweetpotato Speedbreeders

## Progress in breeding in Rwanda: Incorporating Feedback from Farmers



### INTRODUCTION

Sweetpotato [*Ipomoea batatas* (L.) Lam.] is an important food crop in many parts of Africa, especially in Sub Saharan countries. In Rwanda, it is cultivated throughout the country and is especially important in densely populated areas of the plateau central (mid altitude), and Bugesera (low altitude) (Ndirigwe, 2006; Njeru *et al.* 2008). Although it is considered as a “flexible crop” due to its ability to produce under adverse weather and soil conditions, most of cultivated sweetpotato varieties are white fleshed cultivars characterized by low yield and low tolerant to sweetpotato virus diseases. Usually breeding and selecting genotypes for the important production zones can take up to 8 years for a varieties to go for release. However, using innovative Accelerating Breeding Scheme (ABS) proposed by Grüneberg *et al*; 2009, new sweetpotato varieties have been released in three years and promoted across all agro-ecological zones in Rwanda.

### METHODS

- Surveying, collecting, evaluating, and selecting from local germplasm good parents to be incorporated in the crossing blocks.
- Use ABS with more parents, more controlled crosses and coupled with a rapid selection through farmer participation (FP) across 3 locations and 6 environments during the first clonal evaluation. This allows early identification of stable genotypes.
- Select drought and virus tolerant, and dual purpose sweetpotato varieties through FP
- Through farmer participatory approach and innovation platforms, released OFSP varieties and made them available to the public, private, developmental organizations, and farmer group’s for planting.

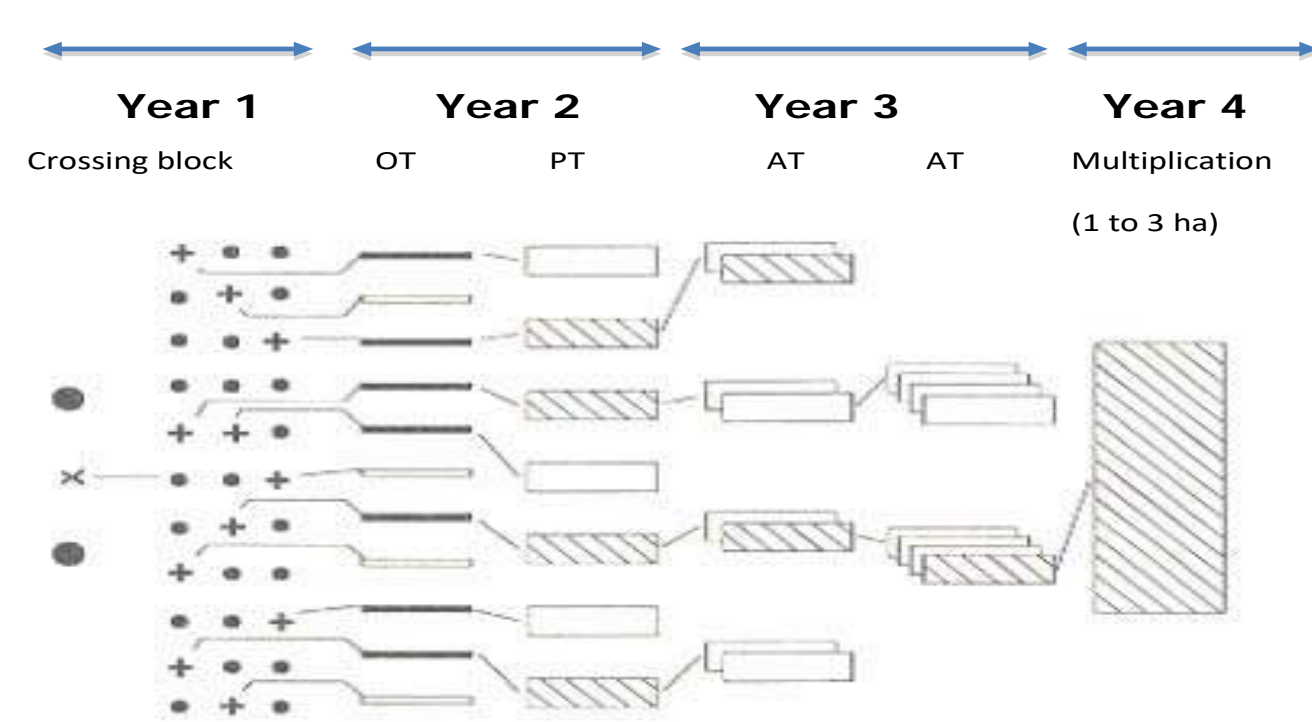


Figure 1. Accelerated Breeding Scheme for vegetative crops (Grüneberg, 2009).

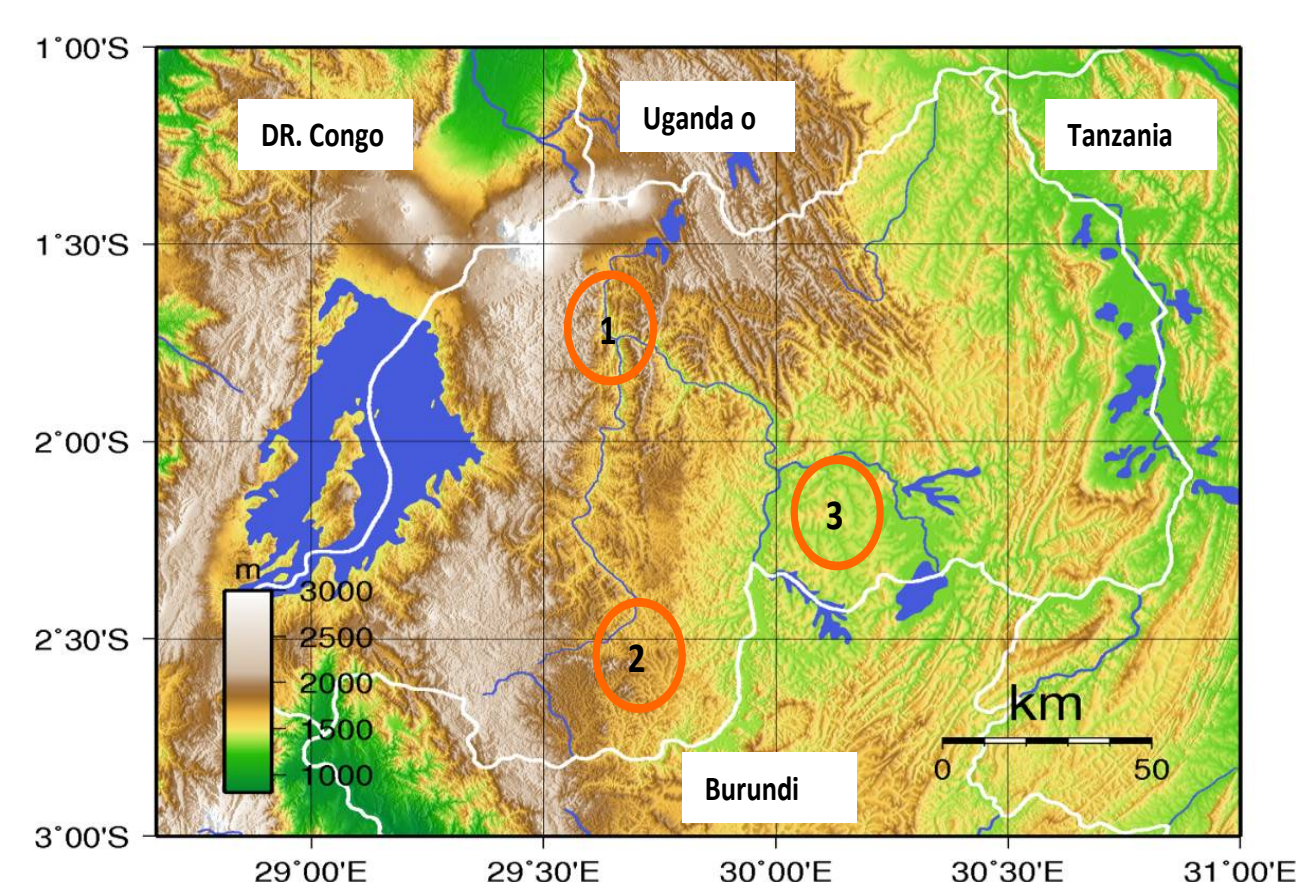


Figure 2: The 3 major agro-ecological zones in Rwanda

### RESULTS

- Drought tolerant and high yielding orange, white and purple fleshed sweetpotato varieties high and medium dry matter content, rich in beta carotene, or anthocyanins, and or other polyphenolic components have been also identified.
- Eight new varieties for human consumption and animal feed were released to farmers in three years.
- There is evidence these new varieties have a higher yields on average of 12 t/ha compared to farmers variety of 5 t/ha under farmers conditions.
- Some are very good dual purpose for roots and animal fodder.
- Around 80 Decentralized Vines Multipliers are using the released varieties for large scale dissemination.



Photo 1, 2&3: Quality traits (mainly High dry matter content, skin and flesh color/B-carotene)

Table 1: Yield performance of selected genotypes under ABS

No	Clone code	Root yield (T/ha)	Dry matter content (%)	Flesh color
1	Rw- 2560	29.13	21.00	Deep Orange
2	Rw- 3736	27.50	23.47	Light Orange
3	Rw-2910	25.28	31.13	Deep orange
4	Rw-1860	22.92	37.78	Cream
5	Rw-2285	22.78	30.00	Cream
6	Rw-17	22.35	30.80	White
7	Rw-5091	20.69	28.83	Light orange
8	Rw-5135	20.28	28.47	White
9	Rw-2419	18.87	24.90	White
10	Rw-3074	15.58	33.43	White

### RELEVANCE FOR DIFFERENT FOOD SYSTEMS

Good selection sites (Low - medium altitude zones) and partners have been identified in Rwanda, where sweetpotato is important, and which varying agro-ecologies. Farmer’ participating in selecting genotypes in important production zones strengthens breeding linkages. It also enables a client-oriented breeding effort for varieties with different desirable traits increasing variety acceptances, adoption and diffusion.



Photo 4&5: Ndirigwe Jean explores farmers preferences during a harvest and taste testing assessment in Muhanga District

### CONCLUSIONS:

- 1.New released varieties namely, Cacearpedo, Gihingamukungu, Terimbere, Ndamirabana, and Maryoha possess preferred traits by farmers compared to the local varieties
- 2.Some of the varieties have dual purpose qualities and most have high drought and disease tolerance traits
- 3.Farmers are important partners in the breeding and selection process for ease adoption of varieties
- 4.Breeding process need to include processors, food scientists, and other value chain players to speed up the breeding process for adoption for different markets
- 5.Breeding and selection efficiency are increased by evaluating at more than one location from the initial clonal selection stage
- 6.Assessment of farmer-preferred traits and their implications to sweetpotato breeding showed that most farmers (>76%) preferred marketable root size and expressed their preference to red color skinned varieties in Rwanda

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