BREEDING FOR ENHANCED BETA-CAROTENE CONTENT OF SWEETPOTATO IN BURKINA FASO

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Sweetpotato production is estimated at 81,000 t in 2008.
Sweetpotato production areas (green)

Evolution of sweetpotato production from 1984 to 2007

Yield evolution in the last 10 years

DGSPA, 2008
Sweetpotato is becoming a supporting crop that significantly helps in food security in the area of production.

It is a staple in rural areas and cash crop especially for women in urban centers.
Nutritional status in the world

Burkina Faso

High Risk Areas
- Iron deficient
- Vitamin A & Iron deficient
- Iodine, Vitamin A & Iron deficient

USAID, 2003
Vitamin A deficiency in Burkina Faso

- Based on a small community-study in the rural part of Burkina Faso, 84.5% of children under-five and 61.8% of their mothers were found to be VAD (Zeba et al., 2006).

- As an intervention strategies to address VAD, large scale supplementation with high-dosage Vitamin A capsule has been preferred.
Red palm oil: 4,200 µg/100g
Mango: 400 µg/100g
Green vegetables: 126 µg/100g

Milk: 60 - 580 µg/100g

Liver: 5,040 µg/100g

Egg: 2,000 µg/100g

Parkia biglobosa: 166 µg/100g

Orange-Flesh Sweetpotato: 2,400 - 12,000 µg/100g
• Varieties grown in Burkina Faso are dominated by the white-flesh sweetpotatoes.

😊 They are poor in beta-carotene and micronutrients content
😊 have low yield (9 t/ha)
😊 But are rich in dry matter and well-adapted to the located environment

• Improved OFSP have been introduced:

😊 They are negatively affected by biotic and abiotic factors (virus, insect, drought etc.)
Breeding objectives

GENERAL OBJECTIVE

• Development of high beta-carotene content and high yielding sweetpotato in Burkina Faso:

SPECIFIC OBJECTIVES

• Identify the main production constraints and understand farmer’s and consumer’s preferences through Participatory Rural Appraisal (PRA).

• Collect and characterize the local germplasm and select superior parents to be used in a basic breeding program.

• Develop new varieties rich in beta-carotene and adapted to the local environment using in crosses the introduced beta-carotene sources and the local material.
• Analyze the gene actions involved in beta-carotene and yield inheritance in crosses of local cultivars with selected high beta-carotene varieties.

• Select high yield with high dry matter and high beta-carotene clones adapted to the local environment.
Materials and methods

• Participatory Rural appraisal (PRA) to identify and understand farmer’s and consumer’s preferences in the 2 main production areas.

• Germplasm collection and characterization (morphological and molecular)
Population development

- crossing block with 30 parents (15 locals choose for their performance and the flowering habit and 15 OFSP)

- Crossing according to NCD II (5 x 5 targeted)
State of the research

• PRA data available and will be analyzed using SPSS package

• 144 accessions from 90% of production area collected.

• Morphological characterization done but has to be repeated to confirm the traits.

• 1703 crosses have been made and 309 controlled seeds obtained.
  Seeds have put in germination under screen house
  Seedlings are in multiplication stage
To be done

- Progenies will be evaluated in three environments and two replications
- Analyses of beta-carotene with HPLC
- Genetic analysis will be done according to NCD II
- Molecular characterization of the collected material with SSR markers
- Superior parents will continue to be identify and crosses to increase seed production
Facing challenges

• Identified parents are not flowering (17 over 30). Darkness treatment for 16 h is found to be unsuccessful.

• Challenge on getting sufficient progeny vine for evaluation.

• Future maintaining disease free planting material
Thank you