SWEETPOTATO BREEDING PROGRESS IN THE SAHEL

SOME Koussao
Sahel rainfall time series
Some consequences

• Climatic changes and drought reduce biological productivity including for sweetpotato

• Increase migration

• Reduce human well-being including malnutrition and VAD
• Eratic rainfalls:
  ✓ Quantity generally low (400 to 1200 mm)
  ✓ Geographically not well distributed
  ✓ Unimodal and short (3 to 5 months)
  ✓ Violent

• Sweetpotato weevil, a serious problem

• SPVd affecting planting material quality and root production

• Variety dominated by white-fleshed sweetpotato in an area of malnutrition including VAD prevalence

• Yield of existing OFSP varieties still below some farmer’s variety yield (Fadanga)

• Short shelf-life

SPHI, September 24-26, 2018, Concord Hotel, Nairobi, Kenya
BREEDING OBJECTIVES

• To develop high yielding and well adapted sweetpotato to the sudano-sahelian zones of Burkina Faso (90 to 105 days)

• To improve the beta-carotene and dry matter content in the local sweetpotato that could be used to address vitamin A deficiency

• To develop resistant varieties to pests (weevil) and diseases (SPVD)

• To address market-related traits: shape, shelf-life, taste, etc
MAIN BREEDING ACTIVITIES

• Screening germplasm (387 local and introduced clones) for:
  ➢ Drought tolerance and sweetpotato weevil resistance
  ➢ Resistance to SPVD using ACP-Elisa, molecular techniques and field observations
  ➢ Shelf-life attributes (cortex thickness very important)

• Identify parental clones for the various traits of interest
• Develop OFSP varieties for the Sudano-Sahelian zones of West Africa
MAJOR ACHIEVEMENTS

• Five OFSP varieties released and registered in the national variety catalogue in 2014
Tiebele-2: 20-20 T/ha, DM 25%

Bagre, 22 T/ha, DM 27%

Joel, 17 T/ha, DM 26%, sweet

Nagnounondo-1, 22-25 T/ha, DM 25%

Nagnounondo-1, 15-20 T/ha, DM 25%

Tiebele-2: 20-20 T/ha, DM 25%

All susceptible to SPVD

SPHI, September 24-26, 2018, Concord Hotel, Nairobi, Kenya
Five varieties in the pipeline for release

- Four OFSP varieties
- 1 Purple-fleshed variety
- Have moderate to good resistance to SPVD
<table>
<thead>
<tr>
<th></th>
<th>Pedigree</th>
<th>Yield (t/ha)</th>
<th>Colour</th>
<th>DM Cont. (%)</th>
<th>B-carotene (mg/100g of fresh root)</th>
<th>Reaction to SPVD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BF59X CIP-4</td>
<td>20-25</td>
<td>Flesh: Deep Orange Skin: Yellow</td>
<td>29</td>
<td>8.32</td>
<td>Good resistance to potato virus disease (SPVD)</td>
</tr>
<tr>
<td>2</td>
<td>BF59X CIP-1</td>
<td>15-20</td>
<td>Flesh: Orange Skin: Pink</td>
<td>27</td>
<td>4.00</td>
<td>Moderate resistance to SPVD</td>
</tr>
<tr>
<td>3</td>
<td>BF13XCIP-3</td>
<td>15-20</td>
<td>Flesh: Light Orange Skin: Light Pink</td>
<td>26</td>
<td>1.76</td>
<td>Moderate resistance to SPVD</td>
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<tr>
<td>4</td>
<td>TU-Or</td>
<td>15-20</td>
<td>Flesh: Light Orange Skin: Light Pink Good shape</td>
<td>26</td>
<td>7.12</td>
<td>Susceptible</td>
</tr>
<tr>
<td>5</td>
<td>TU-Pourpre</td>
<td>25-30</td>
<td>Flesh: Purple Skin: Purple</td>
<td>31</td>
<td>Rich in antioxidant</td>
<td>Moderate resistance</td>
</tr>
</tbody>
</table>
Parental clones identified

• Drought tolerant and Weevil resistant: CIP199062-1, BF16, Ligri and Djakani with yield ≥8.5 T/ha after 55 days of rain of 566 mm

• Virus (SPFMV, SPCSV) resistant: Fadanga, BF13 and BF18 (poor flowering ability)

• Good shelf-life attribute (20 to 46% of losses due to mainly to rotting after 99 days of conservation in room temperature): BF77xResisto-5-1, TIB-16, Mother delight, BF77xResisto-5-20, BF92xResisto-2-11
Sharing material with other countries

- Many OFSP varieties shared with some countries
  - Côte d’Ivoire (CNRA)
  - Mali (IER and World Vegetables)
  - Senegal
  - Gambia
  - Ghana
  - Togo and Benin
  - Chad
MAIN CHALLENGES

• Weak seed system to drive the breeding products

• Lack of tissue culture facility for cleaning up diseases and to maintain/produce clean material

• Water issue mainly during the dry season
PARTNERSHIP

• NGOs: HKI, CRS, iDE, GIZ involved in the varieties evaluation in different locations.

• Programmes: FAO, USAID-Regis, Farm Radio International.

• Ministry of Agriculture through extension.

• Farmers organizations in 5 regions.

• Seed companies and multipliers: NAFASO, DVMs.
ACKNOWLEDGEMENTS

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• CIP
• PIGEPE/IFAD
• WACCI (University of Ghana)