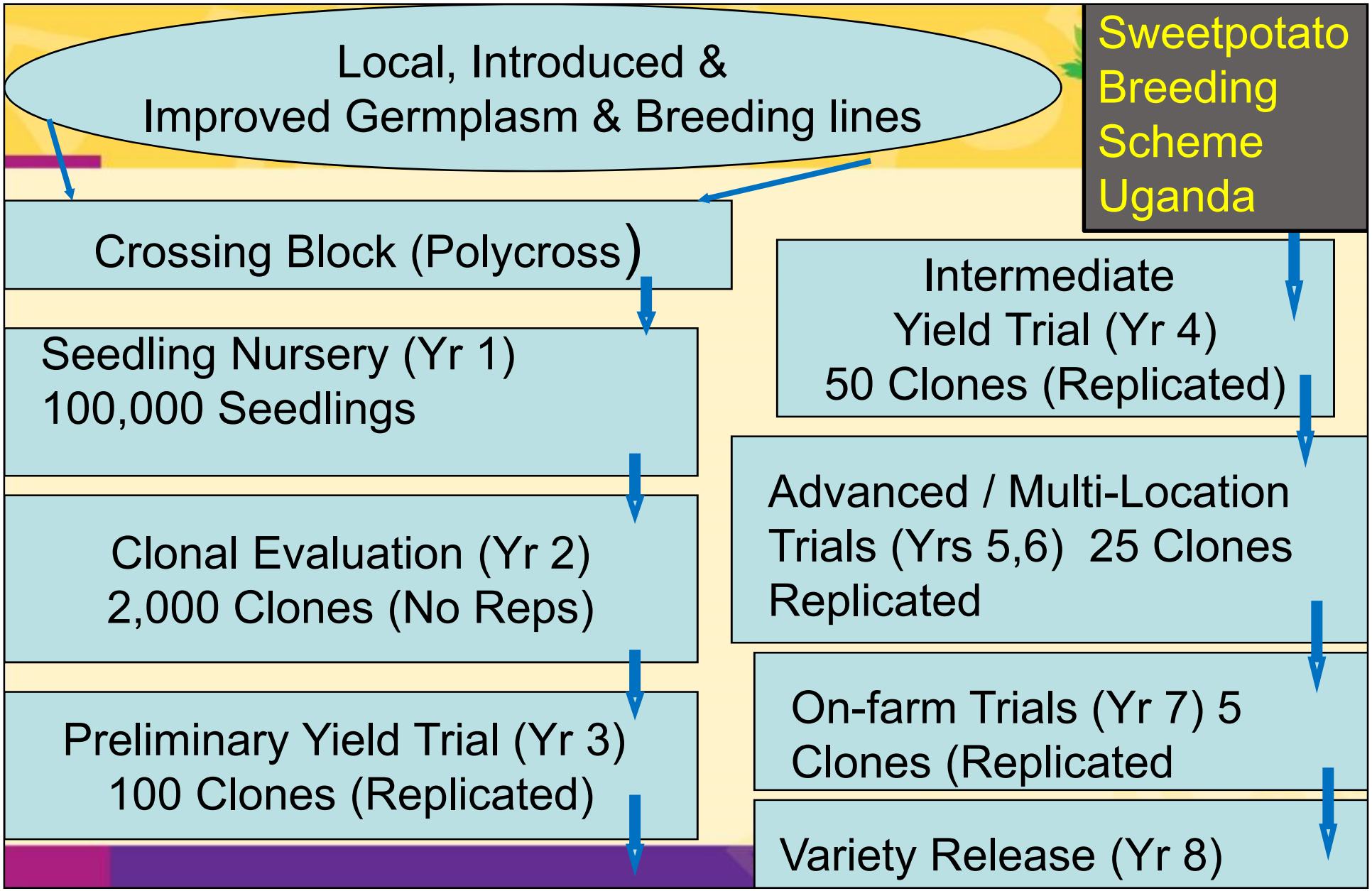
Sweetpotato variety and population improvement: CIP experience with national programs

R. Mwanga, W. Gruneberg, J. Low T. Carey, M. Andrade, C. Wasonga, L. Wanjohi and G. Ssemakula

Plant Led Plant Variety Design Workshop

13-15 May 2014 Windsor Hotel Nairobi, Kenya

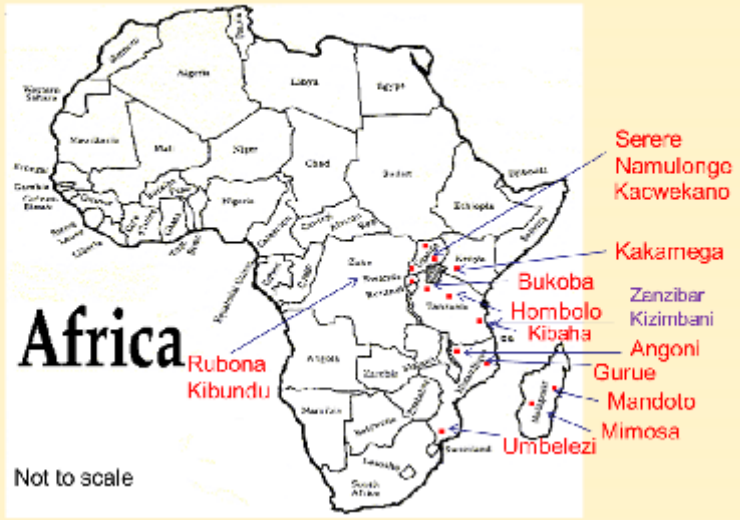
SWEETPOTATO ACTION FOR SECURITY AND HEALTH IN AFRICA


Local, Introduced &
Improved Germplasm & Breeding lines
Sweetpotato
Breeding
Scheme
Uganda
Crossing Block (Polycross)
Seedling Nursery (Yr 1)
100,000 Seedlings
Clonal Evaluation (Yr 2)
2,000 Clones (No Reps)
Preliminary Yield Trial (Yr 3)
100 Clones (Replicated)
Intermediate
Yield Trial (Yr 4)
50 Clones (Replicated)
Advanced / Multi-Location
Trials (Yrs 5,6) 25 Clones
Replicated
On-farm Trials (Yr 7) 5
Clones (Replicated
Variety Release (Yr 8)

Changing the conventional

- Main objective of sweetpotato breeding specific for each of 3 sub-regions of SSA (Support platforms): Ghana, Mozambique, Uganda

Regional GxE OFSP, 15 Trial Sites 2006/2007



Accelerated breeding

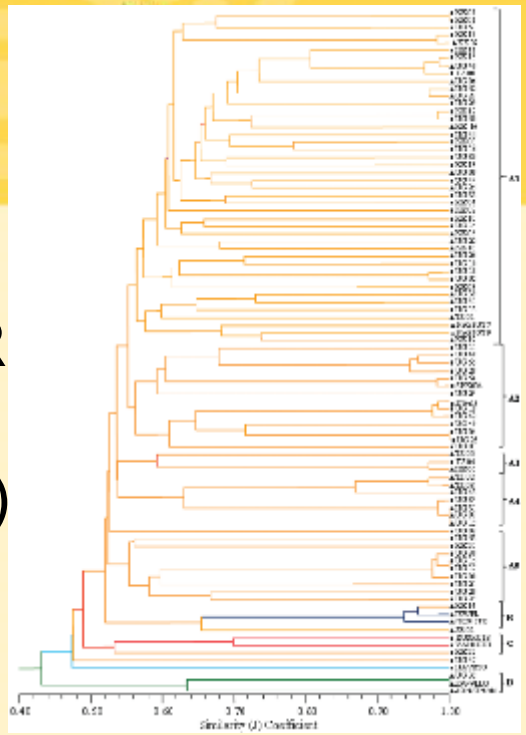
Multiply new breeding lines in screenhouses, glasshouses, irrigated fields

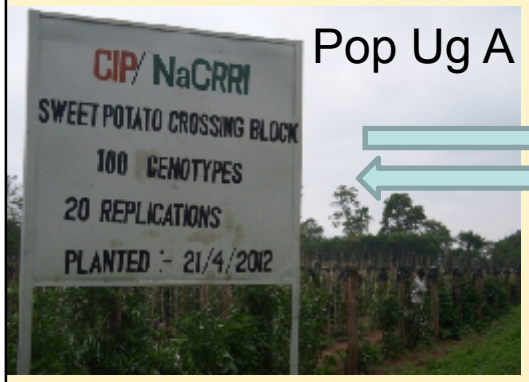
Use more sites at earlier stages in the breeding cycle to substitute for fewer sites over more seasons

Harmonized breeding procedure
Introduced CloneSelector

Developing populations for SPVD resistance and quality traits

- Two distinct genepools (Population Uganda A and Pop Ug B) were formed based on 18 SSR markers
- Controlled crossing (inter- and intra-gene-pool) for population improvement and polycross crossing are in progress





Pop Ug A

Pop Ug B

Merits of PPB during experimentation

- Demonstrate potential significant rapid progress in sweetpotato (SP) breeding
  - **Specific target environments and client-oriented**
  - In 3rd year participating farmers started consuming promising SP clones and selling in year 4 (compare to year 8 in conventional)
- High risks involved in PPB
  - Loosing valuable genetic material
  - Factors: drought, destruction by wild animals (e.g. monkeys, hippos) domestic animals (e.g. goats, cattle), thefts/neighbors, inadequate budget support
  - Type of starting material (base population)
  - Important to keep part (subset) of population as backup
  - Important to consider type of trait
- Success depends on designer (E.g. Dissemination of OFSP)