

CURRENT STATUS OF SWEET POTATO RESEARCH IN MALAWI



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INTRODUCTION

- Maize is the staple food in Malawi
- Sweet potato is the second important root crop after cassava
- It is grown across the country as snack and as a major food crop during periods of food shortage



INTRODUCTION (CONT'D)

- It is a source of employment and cash to many Malawians
- Orange-fleshed sweet potato varieties are a viable and sustainable strategy to Vitamin A deficiency (VAD) - an option for Malawi



ADVANTAGES OF SWEETPOTATO IN MALAWI

- In Malawi, sweetpotato has the advantage of having a short growth cycle of 4-5 months after planting to supplement/relay food availability.
- In addition, sweetpotato crop is grown as a “low risk crop” that does not require a lot of external inputs which, are not affordable by poor resource farmers in most cases.



PROMOTION OPPORTUNITY

- In dry season sweet potato is grown under residual moisture in Chikwawa, Nsanje and Karonga and the off season has good prices
- There are many NGOs promoting production of sweet potato through the provision of planting material. Could therefore easily promote orange fleshed cultivars.



SWEET POTATO PRODUCTION AT FARM LEVEL

- Mostly rain fed which is 4 to 5 months a year.
- Normally planted late due to:
 - Lack of planting materials at planting time as farmers have to wait for re-growths from previous fields to sprout to be used as planting material for the next season.
 - Dependency on family labour-farmers plant maize and other crops first which do not do well when planted late. Farmers have realized that they still get reasonable yield from sweet potato even when planted late.



PRODUCTION CONSTRAINTS

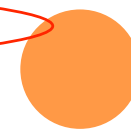
- Just like all other crops, sweet potato is beset with social economic and agronomic constraints
- Although yield/ha has doubled over the years from 5t/ha to +10t/ha, improved sweetpotato varieties on research stations yields up to +30t/ha



TABLE 1: PRODUCTION TREND (1995-2005)

Year	Area (ha)	Production (t/ha)	Yield (t/ha)
1994/95	60,701	317,714	5.23
1995/96	68,804	596,469	8.66
1996/97	91,884	860,085	9.36
1997/98	136,709	1,447,994	10.59
1998/99	140,904	1,561,345	11.08
1999/20	166,251	1,966,833	11.83
2000/01	190,947	2,534,896	13.27
2001/02	219,766	2,783,307	12.66
2002/03	112,287	1,444,087	13.43
2003/04	147,000	1,573,000	11.00
2004/05	122,000	1,274,000	10.4

Source: FEWS/MoAFS



AIMS OF SWEET POTATO IMPROVEMENT PROGRAMME IN MALAWI

- Develop varieties that:
 - Give high yields per unit area and time
 - Are resistant/tolerant to sweet potato virus complex disease (SPVD) and sweet potato weevil (SPW) in Malawi
 - Give desired root quality (colour, root size and shape, high dry matter, good taste, aroma)
 - Varieties with high vitamin A precursor
 - Wide adaptability to wide environmental conditions and cropping systems



STRATEGY

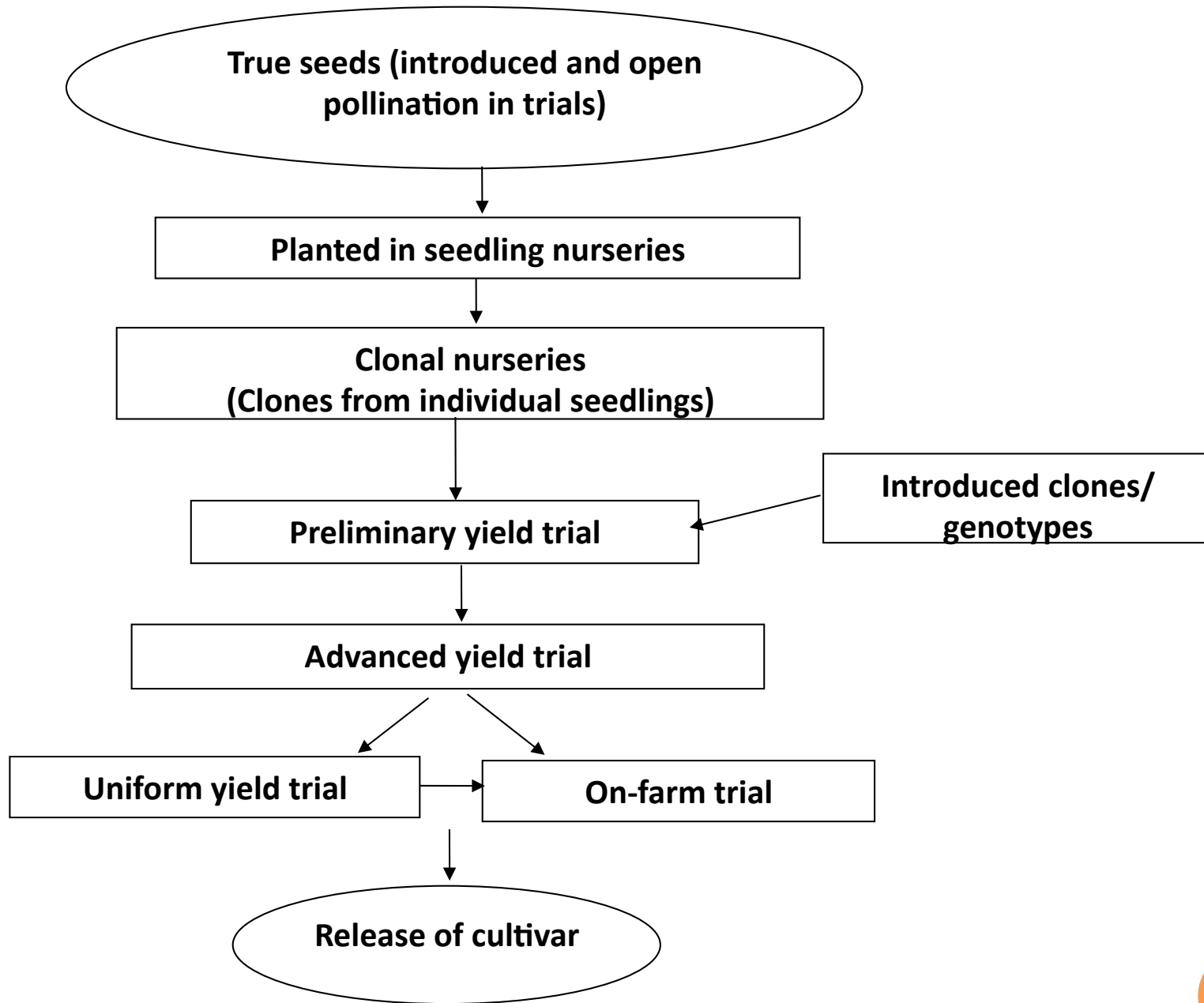
- Implementation of a series of on-station and on-farm trials



Germplasm source

- CIP: Source of Semusa and Mugamba
- AVRDC: Tainoni
- Tanzania: Kenya
- IITA: Kakoma (TIS 3417)
- OP: Sakananthaka

Current source: True seeds from Uganda, Mozambique and South Africa



Schematic routine for sweet potato evaluation in Malawi

CURRENT SERIES

- Seedling nursery- 6078 seedlings (2009) have selected 193 orange, 82 white and 2 purple fleshed for 2009/10 clonal nursery
- Clonal nursery- 400 seedlings in 2008; 41 in 2009 clonal and 16 for 2009/10
- Preliminary yield trial (orange and white fleshed)
- Advanced yield trial (white and orange fleshed)

Table 2: Research achievement

Cultivar	Origin	Yieldt/ha	Year release	Dry matter %	Status
Zondeni	Local	10-15	2008	30	Wide spread, low to medium yield and maturity
Sakananthaka (LU96/303)	OPV	20	2008	31	New release
Yoyera	Local	3-7	80s	36	Being eroded due to very low yields and late maturing,
Kenya (Kemb 10)	Tanzania	20-25	1988	34	Wide spread, released 1988, high yield, early maturity
Kakoma (TIS 3417)	IITA	20-25	1993	32	Less widely spread
Kamchiputu	Local	3-7	80s	36	Being eroded due to very low yields and late maturing,
Tainoni (Tainon 57)	AVRDC ^a	20-25	1999	27	Released in 1999, low adoption, early maturing
Lunyangwa	OPV	20-25	1990	30	Released in 1990, high yield, early maturity, low adoption
Semusa (Cemsa 74-228)	CIP ^b	25-30	1999	31	High yield, early maturity, released 1999 increased adoption
Salera	CIP	20	2001	32	high yield, early maturity, Early maturing
Mugamba (Mogamba)	CIP	20-25	1999	31	Early maturing, high yield, early maturity

ORANGE FLESHED VARIETIES

- The number of orange fleshed varieties is quite low. Officially, only 3 (Tainoni, Kamchiputu and Zondeni) of the 12 are orange fleshed.
- Tainoni adoption is low due to low dry matter content, for Kamchiputu yield per unit area is very low in addition to late maturing.



ORANGE FLESHED VARIETIES CONT'...



Zondeni, a local variety
-recommended in 2008
-yields =6 -20t/ha
-acceptable palatability
-high dry matter content
-Medium maturity
-Being multiplied while
evaluating other varieties



PRODUCTS BEING PROMOTED FROM ORANGE FLESHED VARIETIES

- Sweetpotato juice
 - sweet beer
 - pan cakes
 - Doughnuts
 - Golden bread
 - Baby porridge
- Promotion is mostly done on open days and during training sessions when NGOs request such services on root crops production and utilisation



FUTURE PLANS FOR ORANGE FLESHED VARIETIES

- Need to consider the clones/varieties with low dry matter content but for specific uses
- More introductions have been requested from Peru to identify acceptable varieties
- Need to develop technologies for processing and utilization of such varieties to promote consumption
- Organised seed systems required to boost production



PROSPECTS FOR NEW VARIETIES

- LU/0146
- LU/0428
- LU/0257
 - Orange-fleshed
 - Good high-dry matter and yield
 - Promising at both research station and on-farm



Table 3: Yield results for OFS AYT genotypes

Genotype	Makoka	Lunyangwa	Baka	Bvumbwe
LU06/0436	24.31	6.02	3.78	
LU06/0397	13.89	8.8	9.63	14.47
LU06/0146	29.51	11.57	* 20.83	27.2
Zondeni	23.73	3.7	8.33	20.25
LU06/0428	31.94	18.29	17.13	28.94
LU06/0257	27.78	3.01	16.2	31.6
Semusa	33.56	12.04	17.82	18.45
LU06/0180	10.42		18.06	19.1
LU06/0231		12.5	13.19	17.82
Lu06/0111			14.12	27.66
LU06/0018			8.33	26.04
LU06/0252				21.3
LU06/0185				30.79
LU06/1263				18.06
LU06/0050				19.44
LU06/0043				22.92
LU06/0046				20.49
LU06/0153				29.4
LU06/0014				28.94
Mean	24.39	9.49	13.4	23.49
CV	31.9	43.75	29.94	31.98
Sign	* * *	* * *	* * *	* * *
LSD	4.72	5.76	4.73	6.79

Table 4: Dry matter (%) results for OFS AYT genotypes

Genotype	Makoka	Baka	Bvumbwe
LU06/0436	29.50	26.00	
LU06/0397	30.00	29.30	26.78
LU06/0146	31.00	31.06	30.54
Zondeni	33.50	28.00	33.56
LU06/0428	33.00	31.30	25.58
LU06/0257	29.00	28.50	30.07
Semusa	34.00	33.30	30.68
LU06/0180	37.00	26.00	34.22
LU06/0231		36.10	36.66
Lu06/0111		36.70	26.86
Lu06/0018		31.90	21.49
LU06/0252			28.66
LU06/0185			30.93
LU06/1263			30.53
LU06/0050			31.86
LU06/0043			30.27
LU06/0046			24.65
LU06/0153			33.28
LU06/0014			21.44
Mean	32.13	30.74	29.34
CV	15.87	19.62	25.36
Sign	**	**	***
LSD	2.35	2.74	4.72

WAY FORWARD- PROJECTS

- Establishment of a crossing block- **Agra project (DARS)**
- More emphasis on OFS- fast track current and elite AYT entries to replace Zondeni in 2010 end- **Irish project(CIP/DARS)**
- Involvement with farmers from early stages and shorten time frame for evaluation- **Agra project (DARS)**
- Breeding for specific environments- **Both (DARS/CIP)**
- Emerging sweet potato markets for value addition- revision of breeding objectives to include traits for post harvest processing in addition to breeding for food security **(DARS/CIP)**
- Entails more collaboration with partners, stakeholders and **Sister** Government institutions for success

THANK YOU FOR YOUR ATTENTION

