Phase 1 Achievements of the Sweetpotato Support Platform – Southern Africa

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5th Annnual SPHI Technical & Executive Steering Committee Meeting

10-12 September 2014, Jacaranda Hotel Nairobi, Kenya

Objectives: Breeding & Germplasm Management

SASHA Sweetpotato Action for

Breeding:

Generate drought resistance, orange-fleshed sweetpotato *that combine different quality characteristics with significant improvements in yielding ability*

Germplasm Management*:*

***Maintain good Quality material, Establish community based seed systems for good quality seed dissemination and develop & test* strategies for the multiplication and dissemination of varieties**

Achievements to Date

- Two genetically separate populations developed with new drought screening techniques; two other developed (smaller)
- **First recurrent selection cycle for drought stress adaptation in two independent controlled cross populations in Mozambique by an accelerated breeding scheme (ABS) achieved in 2011;**
- Drought adapted population disseminated as true seed (Half-sib) to NARS breeding programs from 12 SSA countries in June 2011;
- **15 drought tolerant varieties released in 2011;**
- More seed distributed in 2013 (total of over 45,000) to 11 countries;

More Achievements to Date

- **Varieties from regional cleaned and repatriated**

- **Storage roots analysed for quality attributed from the region**
- **For the drought study there was very strong G x E interactions due to irrigation treatments, indicating that population improvement for**
- **drought must be carried out separately from a program aiming at humid zones**
- The trait vine survival is a highly heritable

- **Yields of roots, vine yield, and biomass were lower under drought**
- **High yielding genotypes were observed in both treatments**
- **Harvest index stability might be a key trait to identify clones with yield stability under drought**
- Some cultivar tolerant to drought did not suppress the above ground biomass accumulation during restricted water supply compared with cultivar susceptible to drought

Among others, the most important results included:

- A large number of trials were conducted under the project

Trial established from 2005 to 2009

Locations	Type of Sweetpotato Trial	Nr. Trials	Number Genotypes
4 Sites	All stages including OFT	118	139,508

Breeding Trials Planted from 2011 to 2014

3 Sites	All stages	154	30,760
	OFT	88	
	Candidates Clones to test for varietal release 2014	76	
	Candidates Clones to test for varietal release 2015	57	

Major Achievements to Date cont.

Seeds in storage to distribute in 2014

Indicator/year	2009/10	2010/11	2011/2012	2012/13	2013/2014	Total
Nr Seeds collected	114,786	70,786	132,654	210,681	145,845	674,752
Nr Variety released	3		15			18

Major Achievements to Date cont.
Seeds in storage to distribute in 2014 for ASHA

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Location	2011		2012	
	Controlled	Polycross	Controlled	Polycross
Umbeluzi	1,500	44,157	-	8,147
Gurue	14,498	30,569	30,847	115,223
Total	**15,998**	**74,726**	**30,847**	**121,561**

Multiplication and dissemination for the period 2010 to 2013 in Mozambique

Indicator/Year	2009/10	2010/11	2011/12	2012/13	Total
Area per hectares multiplied (on-station)	3.7	18	32.5	8.5	62.7
Nr of DVM	13	188	210*	278**	278
Area per hectares multiplied DVM/ contact farmers	3.8	37.6	57.5	70***	168.9
Kilograms of Vines	87,250	550,440	916,040	804,000	2357,730
Nr of beneficiaries (Households)	20,729	91,740	94,800	**134,000**	**341,269**

More Achievements to Date

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Indicator/year	2009/10	2010/11	2011/2012	2012/13	2013/2014	Total
Nr plantlets multiplied (lab)		6,441	8,993	14,489	22,896	**52,819**
Nr plantlets virus free (lab)		3,246	3,959	1,824	950	**9,979**
Nr plantlets hardened		696	234	614	612	2,156
Nr Sample processed (NIRS)		1,121	5,029	9,552	9263	24, 965
Nr Sample analyzed (NIRS)		820	5,029	8,492	4353	**18,694**

Summary of quality data for the observational trial of 2484 clones in Gurue, 2012/13

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Data from Lab indicated that 434 clones from a total of 2440 clones were selected

	Total YLD	Storage root DM	BC	Protein	Fe	Zn	Starch	Fructose	Glucose	Sucrose
Min	12.25	25.00	20.10	1.70	1.10	0.76	36.91	1.39	2.80	1.38
Max	40.74	41.20	71.70	11.10	3.30	1.93	70.20	10.06	13.74	22.93
Mean	22.92	29.43	34.88	4.55	1.93	1.24	56.60	4.34	6.19	8.89

COMPARISON OF RELEASES

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Main attributes

Statistic	Total Yield (t/ha)			Betacarotene (mg/100 DW)			Dry Matter Content (%)		
	G1	G2	G3	G1*	G2	G3	G1	G2	G3
Average	14.7	20.3	18.5	-	21.3	29.2	23.5	27.6	27.8
Min.	2.5	14.9	11.4	-	5.9	13.8	17.2	24.8	21
Max.	29.3	27.1	28	-	38.4	68.2	27.5	32.8	33.4

Other quality attributes

Statistic	Starch (%)			Iron (Fe) (mg/100gDW)			Zinc (Zn) (mg/100gDW)		
	G1*	G2	G3	G1	G2	G3	G1	G2	G3
Average	-	52.3	54.2	-	1.8	1.9	-	1.4	1.35
Min.	-	59.9	47.2	-	1.6	1.5	-	1.1	1.0
Max.	-	68.3	69.4	-	2.1	2.33	-	1.5	1.65

Indicators

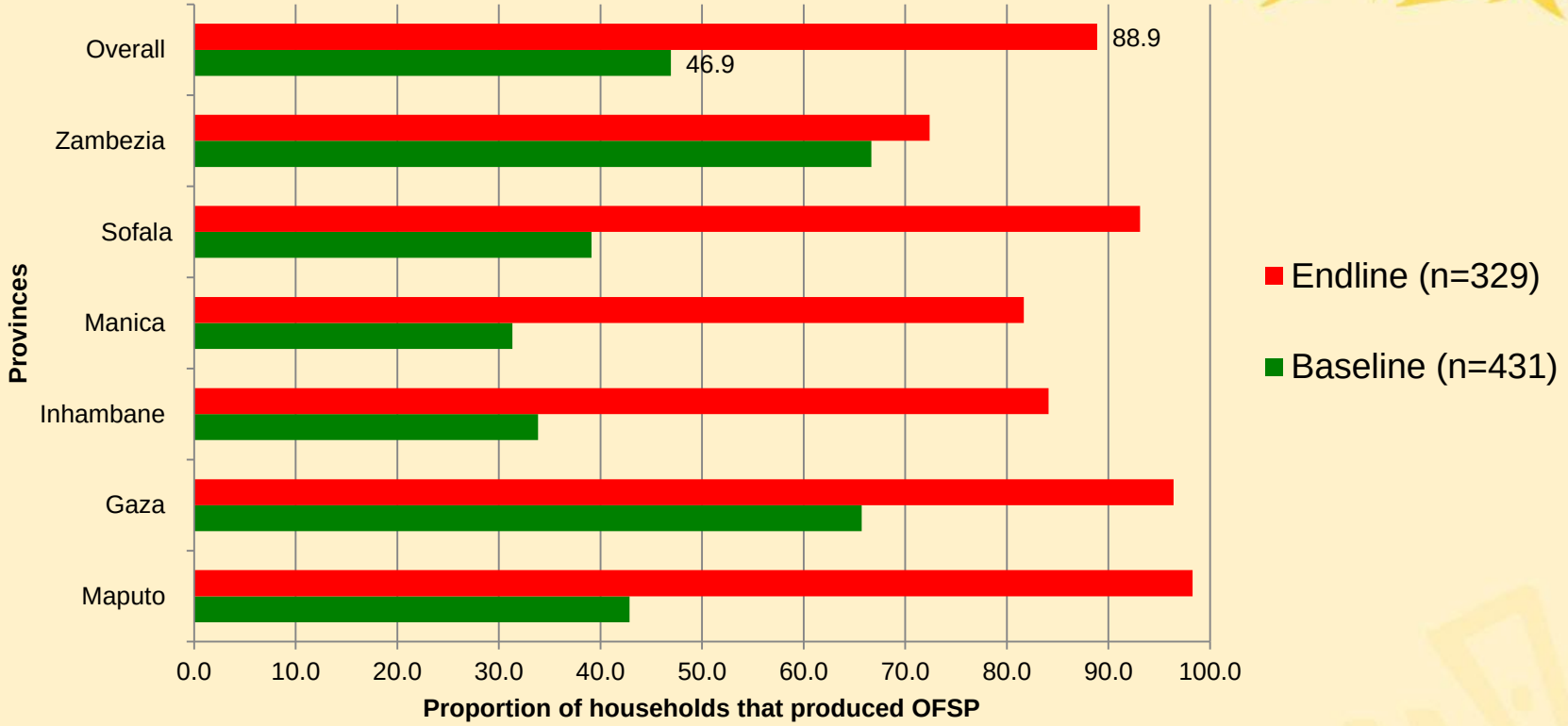
First recurrent selection cycle for drought stress adaptation in two independent controlled cross populations in Moz by ABS achieved by September 2011

- Drought adapted pop disseminated as true seed to NARS (POP means 8 t /ha, 26% DM 59% starch, 100 ppm BC, 1000 ppm Ca, 18 ppm Fe, 9 ppm, Zn by September 2012

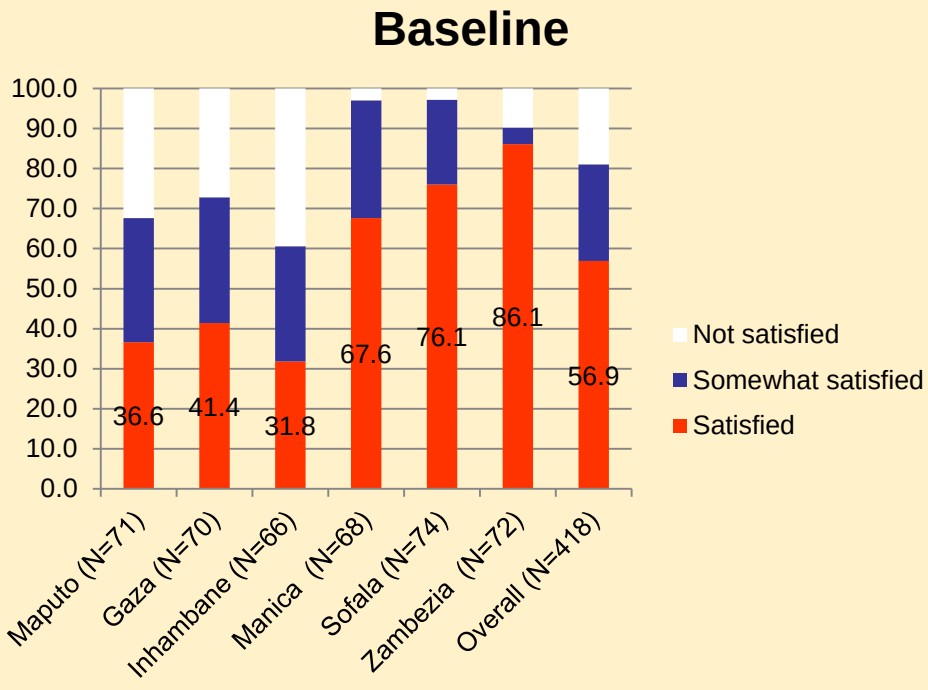
Second recurrent selection cycle for drought stress adaptation completed in 2 independent controlled cross populations in Mozambique by an ABS breeding scheme by September 2013

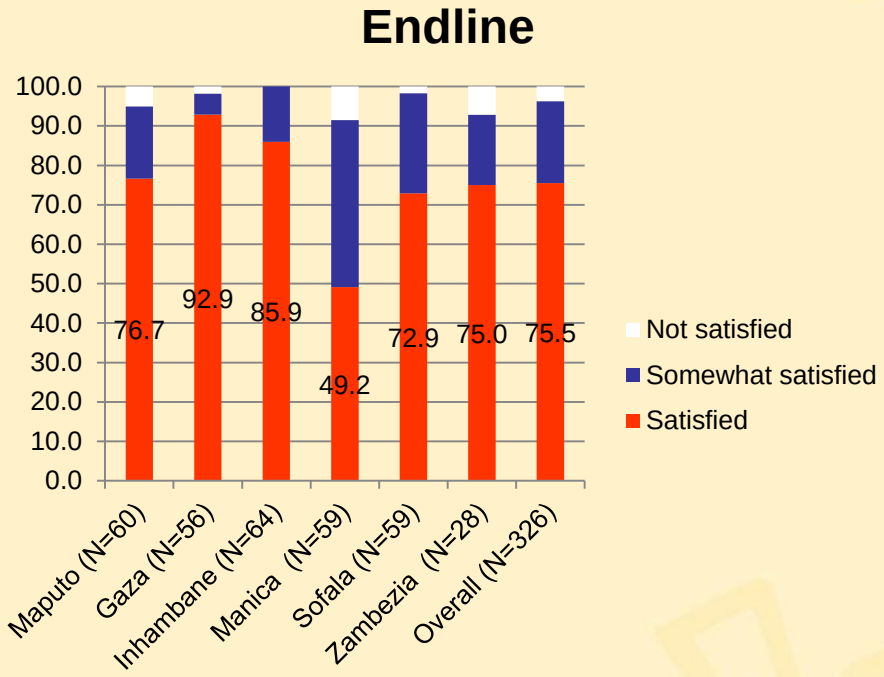
- Drought adapted pop disseminated as true seed to NARS (Pop means of 9 t /ha, 27% DM, 62% starch, 120 ppm BC, 1200 ppm Ca, 20 ppm Fe 11 ppm, Zn by September 2014

OFSP Production



Farmers satisfaction with the quality of the planting material





Indicator/Year	2009/10		2010/11		2011/12		2012/13		Total
	Nr of participants		Nr of participants		Nr of participants		Nr of participants		
	Male	Fem	Male	Fem	Male	Fem	Male	Fem	
Nr of farmers trained in short term trainings	217	691	595	427	343	1027	288	269	**3857**
Nr of technicians trained in short term	84	69	79	84	211	102	81	47	**757**
Nr of farmers trained in agro-processing/nutrition trainings	7	6	13	19	28	14	37	35	159
Degree training BSc	**0**	**1**	**0**	**2**	**1**	**1**			**5**
Degree training MSc	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
Internships	**5**	**3**	**4**	**6**	**24**	**13**	**5**	**5**	**65**
Nr of Displays	**13**		**15**		**28**		**19**		**75**
Nr of Field days	**6**		**8**		**12**		**6**		**32**

Research Support Facilities

- 15 screen houses
- 1 kitchen Lab
- 1 Quality Lab (NIRS Machine)
- 1 Tissue culture Lab with IIAM
- Research Stations

Partnerships

More than 100 partners including

- Research Institution (IIAM, AVRDC)
- Universities
- Public extension (DNER, SPERs, SDAEs
- Commercial farmers (Lozano Farm)
- International NGOs (WV, Save the Children, Care, Action Aid, LWF, VIDA, HKI, etc.)

Lozano Farm

Training Public Extension

Foundation JAT

Promotions

Bono Visit

In 2013 more than 75 display sessions conducted; More then 135 days were spent on these activities. More than 494 people participated;

- Television & Radio Interviews;
- Several field days (more than 30)

Display in Boane District

OFSP Painted Shop

Theatre in Zambezia

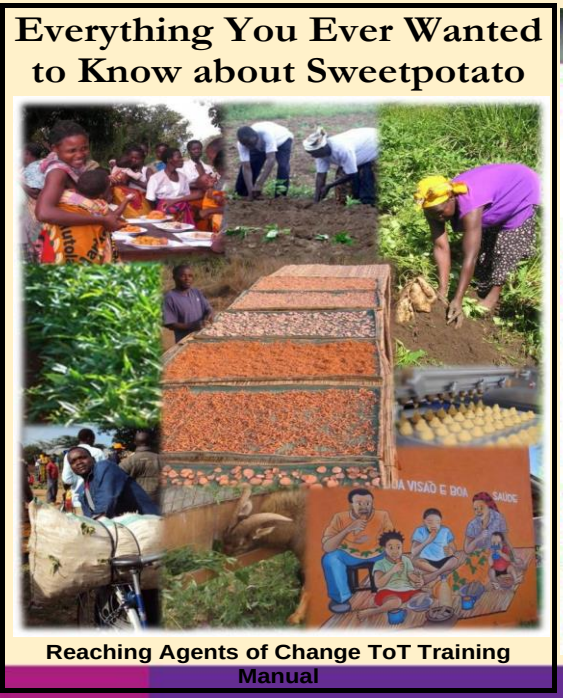
Field day at Umbeluzi

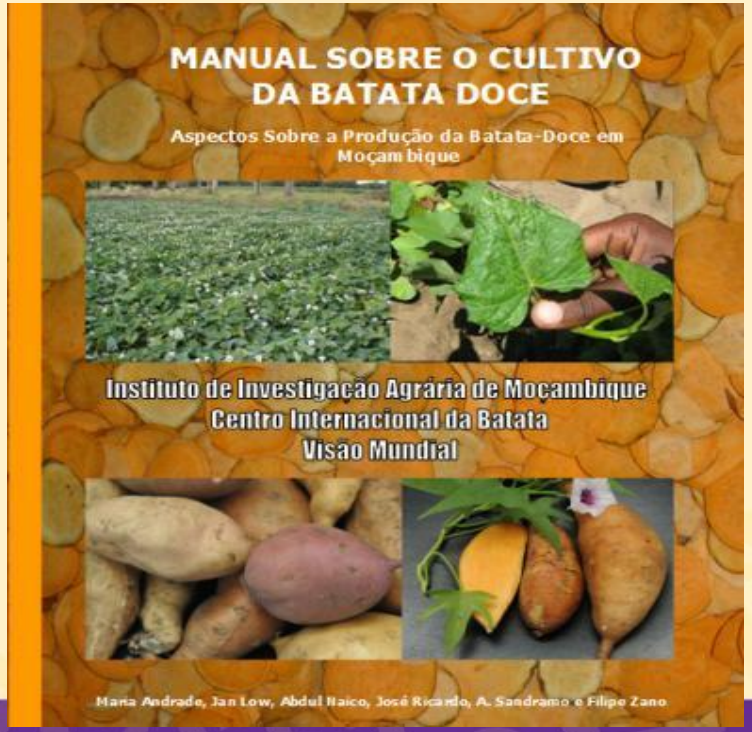
Launching of New Kitchen

Field day at Umbeluzi

Communication

- Posters/leaflets
- Flyers





Policy and Government Support

- IIAM hosting Institution
- Extension services
- PIAT
- PNISA
- CADAAP


PIAT Meeting


Meeting 10 downing


Launching of PNISA with President


Minister of Agric


MPs Visiting


Presid of Mozambique

OFSP formally included in the Government policies in Mozambique

- Part of the Government commitment, the Mozambique National Agriculture Survey **(TIA),** collect sweetpotato data disaggregated by **OFSP** versus non-OFSP;

- Mozambique Technical Secretariat for Agriculture and Nutritional Security is adopting **OFSP** as one of the main crops for food and nutrition security;

- Also **OFSP** is included in country National Plan for investment in Agricultural Sector (PNISA).

Acknowledgements

- Government
- Rockefeller
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- USAID
- HarvestPlus
- SASHA
- Partners