

**Refining maturity period &
quality traits per maturity
period for released cultivars in
Mozambique**

By



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**Breeders Meeting, 06 – 10 June
2016, ILRI Nairobi, Kenya**



Economic importance of orange-fleshed sweetpotato



Orange-fleshed sweetpotato (OFSP) are a good food source containing:

- (1) Micronutrients including beta-carotene
- (2) Carbohydrates

and

Play a critical role in diversifying agriculture (e.g in Mozambique, sweetpotato – rice rotations, maize-sweetpotato intercrops)

Some farmer preferred traits



Pre-harvest	Post-harvest
High storage root yield	Sweetness
Early maturity	Marketability
Pest and disease resistance	Good root shape
Tender leaves	sprouting ability
Ability to grow all seasons	
Good in-ground storability	

Early maturity and its importance



- The ability to give high storage root yield between 3 to 4 months after planting (mature roots).
- Early maturity bridges the hunger gap before harvest of main crops – e.g maize or cassava
- Early maturity allows piecemeal harvesting if in-ground storability is good
- Preferred where sweetpotato is a commercial crop & where there is terminal dry spell

SP cultivars released in Mozambique and their quality traits at 150 DAP



Name	DM (%)	Bc (mg/100g)	Fe (mg/100g)	Fructose (%)	Glucose (%)	PROTEIN (%)	STARCH (%)	Sucrose (%)	Zn (mg/100g)
AMELIA	35.87	20.75	1.70	1.65	3.38	4.68	70.48	1.77	1.24
BELA	28.53	18.06	1.56	3.49	5.51	3.46	69.76	2.70	1.06
CECILA	25.40	20.34	1.44	5.54	7.80	2.47	66.04	3.15	0.95
DELVIA	32.77	16.43	1.82	2.36	4.27	4.80	70.41	3.04	1.18
ERICA	21.49	37.58	1.61	5.56	7.81	2.84	57.39	10.29	1.04
ININDA	26.30	42.93	1.68	3.08	4.73	3.27	65.03	8.59	1.15
IRENE	29.57	26.84	1.60	2.55	4.36	3.84	68.98	4.59	1.14
JANE	28.00	39.07	1.89	3.14	5.50	4.01	63.33	8.66	1.22
LOURDES	25.32	29.43	1.68	4.63	6.89	3.01	64.15	4.81	1.17
MELINDA	25.37	21.50	1.70	4.32	6.28	3.26	62.12	8.68	1.15
SUMAIA	21.71	33.15	1.68	7.23	9.87	2.46	59.21	3.37	1.00
TIO JOE	26.23	41.50	1.84	3.66	5.70	4.10	60.63	9.91	1.22
GLORIA	33.24	21.39	1.57	1.90	3.68	3.59	70.86	2.67	1.17
ESTHER	26.4	10.5	1.6	7.3	10.6	3.6	53.5	8.4	1.1
NAMANGA	26.1	32.8	1.9	4.1	6.6	4.7	56.9	11.3	1.4
ALISHA	32.00	yellow	1.68	1.87	3.59	4.88	71.14	3.62	1.25
BIE	34.28	purple	1.81	2.25	4.22	4.66	68.89	6.50	1.31
IVONE	30.72	ORANGE/PURPLE	2.13	2.39	4.51	5.44	66.40	5.52	1.45
CAELAN	28.22	17.21	1.70	2.39	4.01	4.24	67.80	5.65	1.12
VICTORIA	24.57	35.64	2.44	2.43	4.57	6.01	62.16	8.68	1.75
BITA	34.93	3.84	1.76	1.71	3.86	5.99	70.66	1.51	1.30
LAWRENCE	25.01	yellow	1.67	2.85	4.69	4.08	69.92	2.01	1.24

Objectives



The objectives of the studies were to

- (i) refine maturity periods of released cultivars in Mozambique
- (ii) determine changes in key macro- and micronutrients associated with early or late harvesting of released cultivars in Mozambique
- (iii) Recommend to farmers on the right time to harvest

Materials

	Cultivar			Cultivar
1	Jane		15	Lourdes
2	Delvia		16	Chingova
3	Irene		17	Resisto
4	Amelia		18	Jonathan
5	Esther		19	Bie
6	Glória		20	Caelan
7	Bela		21	victoria
8	Melinda		22	Lawrence
9	Namanga		23	Bitá
10	Érica		24	Alisha
11	Tio Joe		25	Ivone
12	Sumaia			
13	Cecília			
14	Ininda			

Methodology



- Four trials were established at Gurue in July 2015 (irrigated) and December 2015 (rainfed)
- The trials were classified into 4 harvesting periods; 3, 4, 5 and 6 months. (only results upto 5 months are presented)
- Each trial had 25 orange-fleshed sweetpotato cultivars, including 3 checks, laid in a randomized complete block design with three replications

Rain information in Gurué (mm)



	2014	2015	2016
Decemb	109.4	117.5	133.6
January	363.5	624.6	67.9
Februar	304.3	292.9	20.3
March	33.4	127	0
	810.6	1162	221.8

Traits measured for all trials



In the field

Storage root yield and vine yield

Quality laboratory

1. Micronutrients - (beta-carotene, iron, zinc)
2. Macronutrients – (starch and protein)
3. Dry matter (%)

Harvesting and sampling for NIRS



- Harvesting was done on 10.53m² net plot by digging using hoes
- Weight of storage root yield was taken from the net plot
- Four medium storage roots were randomly selected and baged for NIRS

Early storage root yielders

- Some cultivars had already > 7 t/há (national average production in Mozambique) at 3 months.

Cultivar	Yield at 3 months (t/há)	Yield at 4 months (t/há)	Yield at 5 months (t/há)
Lawrence	1.80	4.91	7.20
Chingova	6.28	8.93	11.30
Irene	8.80	13.87	17.60
Bela	10.45	13.99	15.90
Melinda	7.22	11.30	17.10
Namanga	8.39	13.80	15.30
Erica	11.97	11.36	14.70
Tio Joe	9.47	9.37	15.00
Sumaia	11.17	13.77	14.60
Cecilia	11.55	13.93	15.30
Lourdes	8.39	13.04	16.30
Mean	8.68	11.66	14.57

Nutritional changes in the early maturity group during the growing period



Linear increase in nutrients between 3 & 4 months

	DM	BC	Fe	Zn	Starch	Protein
	(%)	(mg/100mgDW)	(mg/100mgDW)	(mg/100mgDW)	(%)	(%)
Harvest						
3 Months	24,62	23,01	1,79	1,26	61,13	3,54
4 Months	27,07	24,85	1,95	1,41	64,26	4,43
5 Months	28,46	25,20	1,94	1,43	58,57	3,61

Summary



- Irene, Bela, Melinda, Namanga, Erica, Tio Joe, Sumaia, Cecilia, Lourdes (all released in 2011) – were found to be early maturing
- Lawrence (officially released in 2016) was also early maturing
- Chingova (check cultivar) was also early
- Dry matter and micronutrients, including starch increased linearly between 3 & 4 months AP

Summary cont



- Early maturing cultivars fit well in short growing seasons, especially now with the threats of climate change.
- High storage root yields at 3 months assist to break the hunger period and income generation where sweetpotato is a commercial crop

Conclusion



- Piecemeal harvesting can begin as early as 3 months after planting in early maturing cultivars as:
 - 1) Yield is already > 7 t/há
 - 2) BC > 20 mg/100gDW
- Selling of roots is possible at 3 months in early maturing cultivars as;
 - 1) DM $> 23\%$

Acknowledgements



- CIP-Mozambique breeding team and the NIRS team led by Maria Isabel,
- Field workers and students in Gurue

THANK YOU