

# DLB Product Profile – Extended shelf-life tomato inbred (Ghana)



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## Design target

Higher yielding tomato with longer shelf-life for the fresh market in Ghana.

Michael Osei is currently Head of the Horticulture Division of CSIR-Crops Research Institute (CRI) and a Senior Research Scientist at CSIR-CRI, Kumasi, Ghana. He leads CRI's national breeding program on tomato and sweet pepper. He has been a tomato breeder for over 10 years and in 2020 completed his PhD at WACCI, University of Ghana. His thesis was on development of fresh market tomato with improved yield, fruit quality and shelf life. He also has a Master's degree in plant breeding and agronomy and has received training in vegetable breeding at Worldveg and Wageningen University. He first joined CRI in 2004 and learnt his profession as an understudy to the resident vegetable breeder. His interests also include African eggplant and other indigenous vegetables.

## Contact

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## Product Profile design team

### Step 1

<b>PP Design Team Lead/Champion</b>	Michael Kwabena Osei CSIR-Crops Research Institute, Kumasi (CSIR-CRI)
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### PP Design Team

Person	Area of Expertise	Name of organization
Michael K. Osei	Plant breeder	CSIR-CRI
Bright Asante	Agricultural economist	CSIR-CRI
Isaac Osei Bonsu	Agronomist	CSIR-CRI
Michael K. B. Kudadze	Field technician	CSIR-CRI
Joseph Gyau	Vegetable technologist	CSIR-CRI
Agyemang Danquah	Molecular biologist	WACCI, University of Ghana

Consultation with tomato farmers (157), consumers (77), market retailers (40), market queens in Accra and transporters between Burkina Faso and Accra

## Clients and markets

### Step 2

Product profile descriptors	
<b>Product profile name</b>	Extended shelf-life tomato inbred for fresh market
<b>Crop</b>	Tomato
<b>Country</b>	Ghana
<b>Geographic regions</b>	Ashanti, Bono East, Upper East, Volta and Greater Accra
<b>Target market segment and positioning</b>	Fresh tomato market. Higher yielding inbred with prolonged shelf-life
<b>Name of target variety to be replaced</b>	Petofake <b>Strength:</b> Adaptable, readily available seeds, good brix <b>Weakness:</b> Poor shelf-life, less firm
<b>Date PP created</b>	03.04.2019

Target client and use	
<b>Value chain primary clients/customers</b>	Farmers, market queens, retailers, wholesalers, consumers
<b>Market scale</b>	Households, local, regional, national markets
<b>Use</b>	Food (salads, sauces and soups)
<b>Type of processing</b>	None – fresh market
<b>Market class</b>	Medium to large oval tomato

Target crop producers and production system	
<b>Number of farmers</b>	80–100
<b>% ratio: male to female farmers</b>	67–75% male:25–33% female
<b>Production system</b>	Open field (+/- irrigation)
<b>Area of production system</b>	30–40 ha
<b>Growth habit</b>	Determinate to semi-determinate (stakes to support plants)
<b>Expected level of inputs</b>	Medium – fertilizer, crop protection chemicals
<b>Typical yield range of target system</b>	7.5–10 t/ha
<b>Cropping system</b>	Continuous monocrop
<b>Mechanisation</b>	None – manual planting, maintenance and harvesting
<b>Agroecological zones</b>	Sudan savannah, forest, transitional, coastal savannah
<b>Total seed market</b>	12–18 kg



## Variety technical specification

### Step 3

Client/customer	Driver	Trait category	Preference group: Women (W) Men (M) Youth (Y) W+M+Y (All)	Trait demand classification: 1. Essential/"must have" 2. Niche opportunity 3. Added-value 4. Winning trait	Target traits	Trait description (Quantitative measures)	Name of benchmark variety	Performance required compared to benchmark variety <,> etc.
Farmer	Productivity	Yield	All	1	Economic yield	Fresh fruit weight > 7.5–10 t/ha	Petofake	>
		Biotic stress resistance	All	4	TYLCV resistance	1–5 scale: 4 (severe)	Petofake	<
			All	1	Bacterial wilt infection	1–9 scale: 6 (moderate)	Petofake, Petomech	<
			All	1	Root knot nematode damage	1–9 scale: 6 (moderate)	Petomech, Petofake	<
			All	1	Late and early blight infection	1–9 scale: 6 (moderate)	Petofake	<
	Abiotic stress tolerance	All	4	Heat tolerance	Fruit set at high temperature (> 30C)	Nkansah HT	>	
	Crop management and harvesting	Plant architecture	All	1	Growth habit	Semi-determinate (1 m and 1.8 m high)	Petofake	=
Post-harvest storage	Storage-life	All	4	Fruit shelf-life	Storage without deterioration > 4–6	Petofake	>	
Transporter	Durability and cost	Transportability and storage	All	4	Fruit storage time	Retail quality before deterioration – minimum 4–6 days	Petofake	>
			All	4	Firmness	Penetrometer pressure test > 51.5 Newton/cm <sup>2</sup>	Petofake	>
Retailer	Sales and profit	Shelf-life	All	4	Shelf-life without refrigeration	Greater than 4–6 days	Petofake	>
Consumer	Satisfaction	Taste	All	1	Organoleptic properties	High total soluble solids	Petofake	=
		Appearance	All	1	Fruit colour and surface	Red and smooth	Petofake	=
		Shelf-life	All	4	Fruit freshness	Number of days before wrinkling of fruit skin > 4–6	Petofake	>



*"When I look at my tomatoes now, I think: They've all benefited from Product Profiling - and so have I! Every scientist working on important food crops should have access to this training, particularly in developing countries. Because whether it's tomatoes or anything else: What matters is creating a variety that people want to buy."*