

Resistant Tomato Cultivar to Bacterial Wilt (*Ralstonia solanacearum*) in Kenya



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Design target

Resistant Tomato Cultivar to *Ralstonia Solanacearum*

Mirara is a research fellow at WACCI, pursuing Master of Philosophy in Seed Science and Technology. He has previously worked in breeding programs for tomato & broccoli at Syngenta Pollen Ltd. He also worked as a Plant Pathologist at KEPHIS, Kenya & a Research assistant at Kenyatta University, Nairobi. He holds a bachelor of science in Agri- Crop science and a master of science (dip) in Plant Pathology- IPM strategies (Italy) and a certificate in agribusiness science in hydroponics technology. His other interests also include rice blast disease of rice and *Alternaria alternate*

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Product Profile design team

Step 1		
PP Design Team Lead/Champion	Francis Mirara	
	International Centre for Advanced Mediterranean Agronomic Studies-CIHEAM Bari, Italy	
PP Design Team		
Person	Area of Expertise	Name of organization
Francis Mirara	Seed scientist & Technologist	West Africa Centre for Crop Improvement
Prof. Maina Mwangi	Prof of Plant Pathology	Researcher Kenyatta University
Dr. Paul Kimani	Research scientist plant Breeder	KALRO
Dr. Agyemang Danquah	Molecular biologist /Breeder	WACCI, University of Ghana
Prof. Steven Runo	Molecular geneticist/Breeder	Kenyatta University
Prof. Kwadwo Ofori	Geneticist/Breeder	University of Ghana

Step 2	
Product profile descriptors	
Product profile name	Resistant tomato cultivar to <i>Ralstonia solanacearum</i>
Crop	Tomato (<i>Solanum lycopersicon</i>)
Country	Kenya
Geographic regions	Highlands, rift valley, and Central Parts of Kenya
Market segment and positioning	Farmers, producers, and consumers
Name of target variety to be replaced	Mar globe Strength: Early maturing, tender texture Weakness: Susceptible to bacterial wilt
Date PP created	28/2/2022
Target client and use	
Value chain primary clients/customers	Farmers, Transporters, Processors, Consumers
Market scale	Local and international markets
Use	Human consumption, Animal feeds
Type of processing	Cooked, canned, fresh, sliced
Market class	Medium to large market class
Target crop producers and production system	
Number of farmers	1,000-5,000
% ratio: male to female farmers	60-70 male, 28-40 female
Production system	Open fields, plastic tunnel, manual planting, harvesting (+/- Irrigation)
Area of production system	3000ha
Growth habit	Determinate height of about 80cm
Expected level of inputs	heavy- fertilizers
Typical yield range of target system	3500-9000t/ha
Cropping system	Monocropping systems
Mechanization	Planting, fertilizer application, and harvesting
Agroecological zone(s)	AEZ II high potential, highlands, rift valley, and central Kenya
Total vegetative propagation material market	12-18kgs

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	High yields	Harvest index (30-35tons/acre)	Nyati F1	>
		Biotic stress resistance	All	1	<i>Ralstonia solanacearum</i>	1-5 scale: 4 (severe)	Prostar F1	=
					<i>Meloidogyne incognita</i>	1-9 scale: 7 (resistant)	Anna F1	=
			1	<i>Fusarium oxysporum</i>	1-9 scale: 6 (moderate)	Anna F1	=	
		Abiotic stress tolerance	All	2	Cold chilling	Flower blossom at low temp <=15°C	Prostar F1	>=
	Harvesting period	All	1	Longer harvesting period	4-6 months	Tylka F1	=	
	Crop management and harvesting	Plant architecture	All	2	Growth habit	Semi-determinate (1 m and 1.8 m high)	Prostar F1	=
	Market value and price	Grain weight	All	1	Harvest index	Higher harvest index of 0.6	Nyati F1	>
		Crop duration	All	3	Early maturity	Harvest it in 70 days	Anna F1	<
		Post-harvest storage	Storage-life	All	3	Longer shelf life	Shel life >10 days	Nyati F1
Transporter	Durability and cost	Container suitability	All	3	Fruit storage time	21 Days	Nyati F1	=
		Transportability and storage	All	2	Fruit storage time	Storage without deterioration > 14 days	Nyati F1	=
Consumer	Satisfaction	Taste	All	1	Organoleptic properties	High total soluble solids	Tylka F1	=
		Appearance	All	1	Fruit color and surface	Red & smooth	Zara F1	=
		Shelf-life	All	1	Long shelf life	14 days	ProstarF1	=>
		Nutrition	All	2	High supplements of vitamin B and Zinc	2.4mg Zinc 1.194 µg vit B complex	Kilele F1	=
		Food preparation	W	3	Easy to cook	10-15 minutes	Anna F1	=
Processor	Raw material quality specification	Canning	All	2	Juiciness	High pulp density	Anna F1	>
Retailer	Sales and profit	Shelf-life	All	1	Long shelf life	21 days	Nyati F1	=
Seed distributors	Variety identification	The unique appearance of plants, grain, and produce	All	1	Seed certification	Verifiable codes	Anna F1	=



“Demand-Led Breeding is helping early career African tomato Breeders to produce innovative varieties with farmers and consumers preferences, adaptable to climate change and with high adoption”