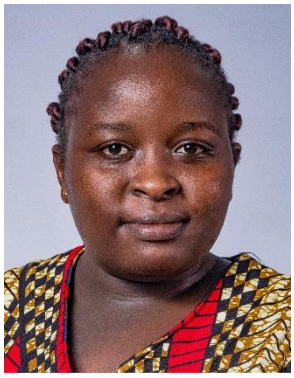
Higher Yielding Sorghum Variety Tolerant to the Parasitic Weed *Striga Hermonthica* for the Kenyan Consumers



Jackline JERUIYOT

Kenya Plant Health Inspectorate Service (KEPHIS), Kenya and WACCI, University of Ghana.

Design Target:

Higher yielding sorghum variety tolerant to striga weed for the Kenyan consumers.

Jackline is a Master's student studying seed science and technology at the University of Ghana. As a specialist in seed science, her goal is to reduce food insecurity by providing farmers with high-quality seeds. She is very passionate about quality seed production, sustainable agriculture, crop production, and climate change. Jeruiyot has expertise in hybrid seed production, agronomy, organic farming, research methodologies, field testing, and seed marketing. She holds an MPhil in Seed Science and Technology from the University of Ghana's West Africa Center for Crop Improvement and a Bachelor of Science in Agriculture from Kisii University.

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Product Profile design team

Step 1	
PP Design Team Lead/Champion	Jackline JERUIYOT
	Kenya Plant Health Inspectorate Service (KEPHIS), Nakuru Kenya

PP Design Team		
Person	**Area of Expertise**	**Name of organization**
Jackline Jeruiyot	Seed scientist and Technologist	West Africa Centre for Crop Improvement
Francis Mirara	Pathologist	KEPHIS
Lydia Chepwambok	Agronomist extension	KALRO
Sharon Chebitock	Seed company	Syngenta
Moses Thomas	Seed breeder	ICRISAT

Step 2

Product profile descriptors	
Product profile name	Tolerance to Striga Weed
Crop	Sorghum (Sorghum bicolor, (L) Moench)
Country	Kenya
Geographic regions	Northern and Central Parts of Kenya
Market segment and positioning	Farmers, producers and consumers
Name of target variety to be replaced	Kari Mtama 1 Sorghum **Strength:** Early maturing **Weakness:** Low tolerant to Striga
Date PP created	26. 08.2023

Target client and use	
Value chain primary clients/customers	Farmers, Transporters, Processors, Consumers
Market scale	Local and National Market
Use	Human consumption, Animal feeds
Type of processing	Cooked, milled, brewed
Market class	Medium to large size

Target crop producers and production system	
Number of farmers	1,000-5,000
% ratio: male to female farmers	60-70 male, 30-40 female
Production system	Open fields, (+/- Irrigation)
Area of production system	2000-3000 ha
Growth habit	More tillers and more finely branched roots
Expected level of inputs	Medium- fertilizers
Typical yield range of target system	4.0t/ha
Cropping system	Monocropping systems
Mechanization	Planting, fertilizer application and harvesting
Agroecological zone(s)	Western parts of Kenya
Total vegetative propagation material market	4-10kgs

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 (4.0t/h)	Gadam	>
		Biotic stress resistance	All	1	Striga weed	ICRISAT scale (5)	Seredo	=
		Abiotic stress tolerance	ALL	2	Drought	ICRISAT Scale (6)	Gadam	>=
		Animal nutrition	ALL		Soft Stover's	Stay green	Seredo	=
		Animal palatability	ALL	2	Lower lignin contents	Soft stem	Kari Mtama 1	=
		Animal digestibility	ALL		Higher feeding value	High Palatability	Serena	=
	Crop management and harvesting	Plant architecture	All	2	Canopy formation	Good canopy formation	Seredo	=>
	Market value and price	Grain weight	All	1	Harvest index	20-30 % moisture content	Gadam	=
		Crop duration	All	3	Early maturity	Maturity in 90 days	Seredo	=
	Post-harvest storage	Storage-life	All	3	Long shelf life	Days shelf life for sorghum grains	Gadam (90 days shelf life)	>
Processor	Raw material quality specification	Milling	All	1	Highest % extraction of grain	ICRISAT Scale moderate (5)	Gadam	=>
		Bread-making	W	3	Improved texture for bread making	11.8% protein, 8.8% fibre	Kari mtama 1	=
		Brewing	M	1	Endosperm texture	High starch content 75% carbohydrate	Gadam	>=
Retailer	Sales and profit	Shelf-life	All	1	Long shelf life	Days shelf life of sorghum flour	Gadam (90 days shelf life)	=
Consumer	Satisfaction	Taste	All	3	preferred taste	Thick porridge and good to the taste	Seredo	=
		Appearance	All	3	Small with chalky white grain	Colour appearance	Gadam	=
		Shelf-life	All	1	Long shelf life	Days shelf life of sorghum flour	Gadam (90 days Shelf life)	=>

		Nutrition	All	3	High supplement of proteins and vitamin B1	Protein 10g supplement Vitamin B1 26% of daily value	E1291	>=
		Digestibility	All	3	Soft and digestible	High dry matter contents of 90-95%	E6518	>=
		Food preparation	W	3	Easy to cook	Cooked in a short period of time (less than 50 min)	Kari mtama 1	=
Seed/vegetative material producer	Scalability and cost	Seed numbers	All	1	Number of seeds in a panicle	60-70 seeds with good fertility rate	Seredo	=
		Reproductive fertility			Self-pollination	Flowers open and pollinate when the panicle emerged from boots	Gadam	=>
Seed distributors	Variety identification	Unique appearance of plants, grain and produce	All	3	Early seedling vigour	7-10 days of panicle initiation	Gadam	=

Different striga resistant sorghum varieties released by Kenya Agricultural and Livestock Research Organization (KALRO) in Kenya:

A- Kari mtama, B-Serena, C-Seredo, D-Gadam

"Demand-led breeding has made it possible to base breeding goals and objectives on what customers want and need without prejudice toward what technology can provide or a special focus on improving certain traits"