

High Yielding and Early Maturing Kersting's Groundnut With High Antioxidant Capacity for Nigeria and Benin



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Design target

High yielding and early maturing Kersting's groundnut variety with high antioxidant capacity

Abiodun Isiaka is a bean breeder and a MPhil fellow working at the West Africa Centre for Crop Improvement WACCI, Ghana. He is a Nigerian and currently a research assistant at Federal University Oye Ekiti, Ekiti State, Nigeria. He has vast experience in bean breeding. He is currently working on the release of two (2) varieties of Mung bean (*Vigna radiata*) which are resistant to Powdery mildew and flood. He has also worked with various teams on the improvement of underutilized legumes at the Laboratory of Genetics, Horticulture and Seed Sciences, Republic of Benin.

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Product Profile design team

Step 1		
PP Design Team Lead/Champion	Abiodun Isiaka	
	Federal University Oye Ekiti, Ekiti State, Nigeria	
PP Design Team		
Person	Area of Expertise	Name of organization
Abiodun Isiaka	Plant Breeder	WACCI
Daniel Adewale	Bean Breeder	Federal University Oye Ekiti, Ekiti State, Nigeria/ IITA
Modinat Adekoya	Food Nutritionist NAFDAC	National Agency for Drug and Food Control NAFDAC
Iwuala Emmanuel	Seed Producer	Terattiga Seed Limited
John Kayode	Bean Flour Processor	EMLAB FOODS
Christian Kingsley	Bean Traders	EASYLAD group

Step 2	
Product profile descriptors	
Product profile name	One life bean
Crop	Kersting's groundnut (<i>Macrotyloma geocarpum</i>)
Country	Benin, Nigeria
Geographic regions	South west, Central and North
Market segment and positioning	Market for bean with high antioxidant capacity, early flowering, big seed size and highly resistant
Name of target variety to be replaced	O2_AF51, O2_AF169 and AKWA44 Strength: Good vigour, resistant to various stresses Weakness: Low antioxidant contents, moderate seed size, late flowering
Date PP created	27.02.2023

Target client and use	
Value chain primary clients/customers	Farmers, Processor, transporters, seed companies, consumers
Market scale	Regional, National and International Market
Use	Food, Animal feed, Medicinal, flour
Type of processing	Milled, cooked
Market class	Bean type

Target crop producers and production system	
Number of farmers	500-1200
% ratio: male to female farmers	40-45% Female and 55-60%
Production system	Open field
Area of production system	80,000-120,000 ha
Growth habit	Bush (Indeterminate)
Expected level of inputs	Medium
Typical yield range of target system	0.8t/ha
Cropping system	Intercrop mixed cropping with Maize
Mechanization	Threshers, Seed cleaner
Agroecological zone(s)	Savanah and Soudano-Guinean zone
Total vegetative propagation material market	60-80 tonnes

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	4	Seed yield	Dry grain yield greater than 0.5t/ha	2_AF169	>
		Abiotic stress tolerance	All	4	Water logging resistant	Resistant to flooding	02_AF169	>=
		Seed size	All	1	Seed thickness	>6.23mm in size	02_AF51	>=
	Fodder/forage	Biomass	All	4	Biomass	Fresh leave weight at maturity	AKWA44	>
		Animal digestibility	All	2	Mushy seeds	Easy to chew	02_AF169	>
	Crop management and harvesting	Plant architecture	All	4	Uniform flowering pattern and time	Indeterminate flower	02_AF169	>
	Market value and price	Seed weight	All	4	Dry Seed weight	Average 100 seed weight	02_AF51	>
		Crop duration	All	1	Early maturing	Number of days from planting to physiological maturity	02_AF51 (85 days)	<=
Processor	Raw material quality specification	Milling	All	4	Easily grounded into Beans flour	High milling % of flour (80-90%) after grinding	02_AF169	>
Food Nutritionist	Immune booster	Antioxidant contents	All	4	Phenolic and Flavonoids contents	High [Phenolic (>3.2 mg GAE g ⁻¹) Flavonoids (>2.8 mg GAE g ⁻¹)]	02_AF169	>
Consumer	Satisfaction	Taste	All	4	Palatability /appetising	Sensory test for favour, texture and aroma on cooked grains	02_AF169	>
		Appearance	All	4	Grain colour	Cream colour	02_AF169	>
		Seed preparation	All	4	Cooking time	Time for cooking fresh grain in minutes	AKWA44 (50 min to cook)	<
		Digestibility	All	2	Soft seed coat and low gas produced	Amount of CO ₂ , hydrogen, methane and nitrogen produced	02_AF169	<
Seed distributors	Variety identification	Unique appearance of plants, seeds and produce	All	4	Seed Viability and germinability	99.99% viability and uniformity	02_AF51	>



“Breeders' achievements should be linked not only to production but also to product relevance over time. Demand-led breeding has filled the gap left by the main cause of the release of irrelevant varieties.

Breeders should breed varieties that people want”