

## DLB Product Profile – High yielding, bold seed size green gram (Ethiopia)



### Berhanu Amsalu

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### Design target

Bold, larger, attractive green seed with higher yield for export markets in India, Pakistan and China.

Berhanu Amsalu leads Ethiopia's lowland pulse (common bean, mung bean, cowpea) research. He has worked as a breeder for the last 19 years and has released more than 25 lowland pulse varieties targeted at different markets and customers. These varieties are grown all over lowland areas of Ethiopia benefiting the growers and value chain actors. Ethiopia is generating more than USD 200 million per annum from the export of these pulses. Berhanu did his PhD studies at University of Pretoria, South Africa 2008-2012.

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### Product Profile design team

Step 1		
<b>PP Design Team Lead/Champion</b>	Berhanu Amsalu	
	Ethiopian Institute of Agricultural Research (EIAR)	
PP Design Team		
Person	Area of Expertise	Name of organization
Berhanu Amsalu	Breeder	EIAR, Ethiopia
Samir Hashim	Breeder	EIAR, Ethiopia
Abel Moges	Breeding and seed system	EIAR, Ethiopia
Fitsum Merkeb	Agronomist	EIAR, Ethiopia
Getachew Ayana	Pathologist	EIAR, Ethiopia
Mulatwa Wondimu	Entomologist	EIAR, Ethiopia
Dejene Abera	Soil scientist	EIAR, Ethiopia
Fitsum Miruts	Agricultural extension	EIAR, Ethiopia
Mekonnen Sime	Agricultural economist	EIAR, Ethiopia
Mulate Zerihun	Food scientist	EIAR, Ethiopia
Mulugeta Tamir	Food Technologist	MoA, Ethiopia

### Clients and markets

Step 2	
Product profile descriptors	
<b>Product profile name</b>	Higher yielding, bold seed size green gram
<b>Crop</b>	Mung bean/green gram ( <i>Vigna radiata</i> )
<b>Country</b>	Ethiopia
<b>Geographic region</b>	Central, North-Eastern, Eastern, Southern, and Western lowlands
<b>Market segment and positioning</b>	Mung bean has established international markets in India, Pakistan and China. Enhanced seed yield, disease resistance, seed size with acceptable consumers sensory evaluation and seed appearance.
<b>Name of target variety or landrace to be replaced</b>	NVL-1 <b>Strength:</b> Uniform seed coat colour, erect plant architecture <b>Weakness:</b> Moderate yield, small seed size, moderate disease resistance (common bacterial blight and Cercospora leaf spot)
<b>Date PP created</b>	18.08.2020
Target client and use	
<b>Value chain primary clients/customers</b>	Farmers, traders, exporters, consumers, farmer cooperative unions
<b>Market scale</b>	Local and international market
<b>Use</b>	Dry seed and sprouts as food (salads, soups and curries)
<b>Type of processing</b>	None
<b>Market class</b>	Dry mung bean seed
Target crop producers and production system	
<b>Number of farmers</b>	100,000-200,000
<b>% ratio: male to female farmers</b>	65-75% male; 25-35% female
<b>Production system</b>	Open field
<b>Area of production system</b>	80,000-120,000
<b>Growth habit</b>	Bush (determinate)
<b>Expected level of inputs</b>	Medium fertilizer, low crop protection
<b>Typical yield range of target system</b>	0.5-0.8 tonnes/ha dry seed
<b>Cropping system</b>	Rotated with other crops, intercropped, double/relay cropping with sorghum
<b>Mechanization</b>	Mainly hand threshing
<b>Agroecological zones</b>	Lowland to mid-altitude (450-1700masl)
<b>Total seed market</b>	350-500 tonnes

## 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	Dry seed yield	Target > 1 tonne/ha seed weight after harvest and drying	NVL-1	>
		Biotic stress resistance	All	1	Common bacterial blight	<3 (CIAT 1-9 scale: 1= no disease)	NVL-1	≤
			All	1	Halo blight	<3 (CIAT 1-9 scale: 1= no disease)	NVL-1	≤
			All	1	Mungbean yellow mosaic disease	<3 (CIAT 1-9 scale: 1= no disease)	NVL-1	≤
			All	1	Cercospora leaf spot	<3 (CIAT 1-9 scale: 1= no disease)	NVL-1	≤
		Abiotic stress	All	3	Drought tolerance	Terminal drought (after flowering)	NVL-1	>
	Crop management & harvesting	Plant architecture	All	1	Erect /semi-erect type	Upright and vine types of growth habit	NVL-1	=
		Maturity	All	1	Uniform maturity	Uniform maturity, few immature pods <5% dry weight	NVL-2	≤
	Market value and price	Grain weight	All	3	Seed size/1000 seed weight	Seed weight greater than 40g	NVL-1	≥
		Crop duration	All	3	Early maturing (escape terminal drought)	Ready for harvest < 75 days after sowing	NVL-1	≤
Consumer	Satisfaction	Sensory evaluation	All	1	Overall acceptance (test, colour and flavour)	Acceptable test, colour and flavour. Target 4-5 (1-5 scale: 5= like very much)	NVL-1	≥
		Appearance (seed size and colour)	All	1	Small seeded, green colour	Uniform colour and size greater or equal to NVL-1	NVL-1	≥
		Seed attractiveness	All	3	Brilliant seed colour	Equal or more shine than NVL-1	NVL-1	≥
		Use as sprouts	W	1	Germination ability	Target greater than 90% germination rate	NVL-1	≥
		Storage	All	1	Long-shelf life	Seed appearance /colour after storing. Target original colour after 12 months	NVL-1	≥
		Food preparation	W	1	Fast cooking time	Short cooking time. Target: < 20 minutes after dry seed overnight soaking	NVL-1	≤



Green gram pods



Green gram seed



Green gram sprouts