# DLB Product Profile – Superior dry grain sugar bean variety (Malawi)

**Rowland Chirwa**
Alliance of Bioversity International and CIAT (ABC), Malawi

**Design target**
Early maturing, sugar bean with a distinctive cream background and red wine speckle colour for domestic use and export to South Africa, and other countries on the TAZAMA bean market corridor.

Rowland Chirwa coordinates the Southern Africa Bean Research Network (SABRN) which covers 12 countries in the SADC region. He also leads ABC's Regional bean breeding program to support the National bean breeding initiatives. He has worked as a bean breeder for the last 26 years. He has facilitated 10 National bean research programs to release more than 50 bean varieties. Each targeted to provide benefits for growers, value chain actors and customers in different markets and countries across the SADC region.

Contact:
Rowland.Chirwa@cgiar.org

*"A Product Profile is a must-have tool in variety development. It keeps the process focused to deliver the target product. This is key so that the intended variety meets all the set specifications and is fit for the intended market purpose".*

Alliance

Bioversity International

CIAT
International Center for Tropical Agriculture

d·lb
demand-led breeding

## Product Profile design team

**Step 1**

| | |
|---|---|
| **PP Design Team Lead/Champion** | Rowland Chirwa |
| | Alliance of Bioversity International and CIAT (ABC) - Malawi |

**PP Design Team**

| Person | Area of Expertise | Name of organization |
|---|---|---|
| Rowland Chirwa | Breeder | ABC, Malawi |
| Virginia Chisale | Breeder | Department of Agricultural Research Services (DARS), Malawi |
| Anne Matumba | Breeder | DARS, Malawi |
| Dimitri Giannakis | Business entrepreneur | Demeter Agriculture |
| Eric Kaima | Seed system specialist | ABC, Malawi |
| Timanyechi Munthali | Economist | DARS, Malawi |
| Donald Siyeni | Agronomist | DARS, Malawi |
| Hilda Kabuli | Biometrics and gender specialist | DARS, Malawi |
| Grace Kaudzu | Seed regulator | DARS, Malawi |

## Clients and markets

**Step 2**

| **Product profile descriptors** | |
|---|---|
| **Product profile name** | Superior dry grain sugar bean variety |
| **Crop** | Common bean (*Phaseolus vulgaris L.)* |
| **Country** | Malawi |
| **Geographic region** | Medium to high altitude areas |
| **Market segment and positioning** | Domestic dry grain sugar bean market, and export market for dry grain sugar bean in the TAZAMA bean corridor (Zambia and Tanzania) and extending to other countries in Southern Africa.<br>Positioning vs. SUG131: Earlier maturing (shorter growth cycle) with a plump oblong shape seed |
| **Name of target variety or landrace to be replaced** | Kholophete - SUG131 (Registered 2002)<br>**Strength**: High yield; resistant to diseases: ALS, BCMV and rust; tolerant to low soil fertility<br>**Weakness**: Late maturing (long duration); kidney shape seed; susceptible to CBB disease |
| **Date PP created** | 05.10.2020 |

| **Target client and use** | |
|---|---|
| **Value chain primary clients/customers** | Farmers, traders, exporters and consumers |
| **Market scale** | Local and export market in Africa |
| **Use** | Dry bean consumption |
| **Type of processing** | No food processing. Only cleaning and packaging |
| **Market class** | Sugar bean |
| **Target crop producers and production system** | |
| **Number of farmers** | 300,000-400,000 |
| **% ratio: male to female farmers** | 40% male; 60% female |
| **Production system** | Open field during rainy season |
| **Area of production system** | 75,000-100,000 |
| **Growth habit** | Bush (determinate) |
| **Expected level of inputs** | Modest fertilizer (100kg/ha NPK), limited pesticides |
| **Typical yield range of target system** | 2.0-2.5 tonnes/ha (pure stand)<br>1.0-1.2 kg/ha (intercropped with maize) |
| **Cropping system** | Pure stand or intercropped with maize) |
| **Mechanization** | Manual labour |
| **Agroecological zones** | Medium-high altitudes (1000-1600 masl) |
| **Total seed market** | 6000-8000 tonnes |

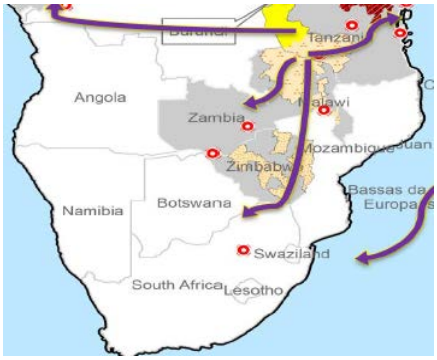
## Variety technical specification

**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 | Grain yield | Dry grain weight > 2 tonne/ha | SUG131 | > |
| | | Biotic stress resistance | All | 1 | Angular leaf spot (ALS) | <3 (CIAT scale) | CAL143 | ≥ |
| | | | All | 1 | Common bacterial blight (CBB) | <3 (CIAT scale) | VAX6 | ≥ |
| | | | All | 1 | Bean common mosaic virus (BCMV) | <3 (CIAT scale) | SUG131 | ≥ |
| | | Abiotic stress | All | 1 | Drought tolerance (at flowering - 6 weeks after emergence) | <5 (CIAT scale) Medium tolerance | SER124 | = |
| | Crop management & harvesting | Plant architecture | All | 3 | Uniform flowering time | <42 days after planting | NUA45 | > |
| | | Crop duration | All | 4 | Early maturity | <70 days to maturity | NUA45 | > |
| | Market value and price | Grain weight | All | 1 | Dry grain weight | 18 kg per 20 litre bucket | Kranskop | = |
| | | Grain size | All | 1 | Dry grain weight | 44 g per 100 seeds | Kranskop | = |
| Consumer | Satisfaction | Taste | All | 1 | Palatability | Soft testa (Scale: 1--9), 9 = very soft | Selian 13 | = |
| | | Appearance | All | 4 | Cream background with red wine mottle | Uniform colour and shiny | Kranskop | = |
| | | Nutrition | W | 1 | High grain micronutrient content (Fe, Zn) | Fe 79 ppm Zn 32 ppm | NUA674 | > |
| | | Digestibility | All | 1 | Flatulence, tender seed coat after cooking | Low gaseous products of digestion | Selian 13 | = |
| | | Food preparation | WI | 1 | Cooking time | < 60 mins to cook (type of cooker/situation, pre-soaking/no soaking etc) | NUA45 | = |
| Seed producer | Scalability | Seed genetic purity | All | 1 | Seed germination | 97% viability 99% uniform time | CAL143 | > |

Sugar bean and maize intercropping

Sugar bean
dry grain colour




TAZAMA sugar bean
market corridor