

Registration of *Gabisa* Common Bean (*Phaseolus vulgaris* L.) Variety

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Abstract: *Gabisa* is a common name for common bean (*Phaseolus vulgaris* L.) variety with pedigree name of VAX-2. It is a bush food bean variety selected out of common bean lines introduced to Ethiopia through CIAT program and released in 2007 by the Bako Agricultural Research Center for production in western Ethiopia and similar agro-ecologies. It was tested on- research stations from 2001 to 2006 and evaluated on farmers' fields in the year 2007. In multi-location on-station trial, *Gabisa* gave a mean seed yield of 2.3 tons ha⁻¹ and hence better performing than the standard check, *Roba-1*, which gave 1.8 tons ha⁻¹. On farmers' fields a mean seed of 2.6 tons ha⁻¹ was recorded for *Gabisa*. *Gabisa* is a bush bean variety with prostrate growth habit. It is food type bean with medium seed size and tan seed color. Yield stability study showed that *Gabisa* require favorable environments for good seed yield. *Gabisa* is resistant to diseases and its seed has 100% soakability with 36 minute cooking time. The breeder seed of *Gabisa* is maintained by the Bako Agricultural Research Center.

Keywords: *Gabisa*; *Phaseolus vulgaris*; Variety Registration

1. Agronomic and Morphological Characteristics

Gabisa has light green leaves with prostrate growth habit. It has thick stem, which apparently contributed to its lodging resistance. On average, *Gabisa* has 24 pods per plant, 4.6 seeds per pod and a plant height of 105.6 cm and its pods are pink in color at physiological maturity. It is a food type bean with medium seed size and kidney shaped seed preferred by farmers mainly because of its seed color. Summary yield and of some agronomic and morphological characteristics of the variety are given in Table 1.

2. Yield Performance

At early breeding stage, *Gabisa* was evaluated for seed yield, from 1999 to 2001 and showed better performance than the standard check, *Roba-1*. In multi-location yield trials at Bako, Billo Boshe and Gute stations for two years (2003 and 2004), *Gabisa* gave a mean grain yield of 2.3 tons ha⁻¹ compared to 1.8 tons ha⁻¹ for the standard check. On farmers' fields, the seed yield of *Gabisa* was 2.6 tons ha⁻¹ (Table 1) which was by far better than the mean seed yield of multi-location trial on stations. On-farm of *Roba-1* was 1.7 tons ha⁻¹.

3. Yield Stability Test

Gabisa was tested for its grain yield performance in areas ranging from 1650-1850 meters above sea level. Its yield stability for two years across the three locations was analyzed following the AMMI model with eleven bush bean varieties. The result of this study showed that *Gabisa* has the highest interaction principal components. This indicated that *Gabisa* is specifically adapted to favorable environments.

4. Disease Reaction

Gabisa was tested for its disease reaction starting from preliminary observation stage and found to be resistant to major diseases in the test location. Based on the standard rating scale of 1-9, where 1 is highly resistant and 9 is highly susceptible, it was found to be resistant to moderately resistant for common bacterial blight (*Xanthomonas axonopodis* pv. *phaseoli*), anthracnose (*Colletotricum lindemuthianum*), and angular leaf spot (*Phaeoisariopsis griseola*) (Table 1).

5. Quality Analysis

Quality analysis conducted at the Melkasa Agricultural Research Center Food Science Laboratory revealed that *Gabisa* has 100% soaking ability with 36 minutes cooking time. Besides its yielding ability and other desirable agronomic traits, farmers preferred *Gabisa* due to its tan seed color.

6. Conclusion

Gabisa is a responsive variety to input for its grain yield performance. It gave better yield than the standard check and resistant to common bacterial blight and fungal diseases of common bean. It also has good characters that can affect food quality of food beans. Generally, it has high preference by farmers with regard to its high yield, good agronomic characters and attractive seed color and better adaptation to altitudes ranging from 1200 to 1900 meters above sea level of Bako areas and similar agro-ecologies in western Ethiopia.

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Table 1. Mean agronomic characters and disease reaction of Gabisa, and *Roba-1* common bean varieties.

Characteristics	<i>Gabisa</i> (VAX-2)	<i>Roba-1</i> (standard check)
Adaptation area		
Altitude (m. a. s. l)	1200-1900	1200-1900
Rainfall (mm)	1000-1200	1000-1200
Fertilizer rate		
N (kg ha ⁻¹)	18	18
P ₂ O ₅ (kg ha ⁻¹)	46	46
Fertilizer application time	at planting	at planting
Fertilizer application method	Drilling in row	Drilling in row
Planting date	Late June to early July	Late June to early July
Seeding rate (kg ha ⁻¹)	90	90
Row spacing (cm)	40	40
Between plants (cm)	5	10
Days to flowering	51	49
Flower color	white	White
Days to maturity	92	91
Growth habit	Bush -Prostrate	Bush
Seed coat luster	Dull	Shiny
Seed color	Tan	Cream
100 seed weight (g)	26	22
Disease reaction (1-9 scale)		
Common bacterial blight	2.3	4
Anthracnose	2	4.5
Angular leaf spot	2	3.6
Mean seed yield (tons ha ⁻¹)		
Research field	2.3	1.8
On farmers' field	2.6	1.7
Year of release	2007	1990