



**STUDIES ON QUALITY ATTRIBUTES AND GRAIN YIELD OF DOLICHOS BEAN
(*DOLICHOS LABLAB*) GENOTYPES (PAWATA TYPE) UNDER WESTERN
MAHAEASHTRA CONDITIONS**

KORADE VN¹, SHETE BJ^{2*}, KAMBLE AB³ AND NALE SS

1: M.Sc. (Agri) Student, Department of Horticulture, MPKV, Rahuri - 413722.

2: Assistant Professor of Horticulture, NARP, Ganeshkhind, Pune - 411067

3: Associate Professor of Horticulture, NARP, Ganeshkhind, Pune - 411067

4: Sr. Res. Asstt., NARP, Ganeshkhind, Pune - 4411067

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*Corresponding Author: E Mail: bjshete687@gmail.com

ABSTRACT

The present investigation was under taken to study the ten genotypes of dolichos bean for yield and quality characters during early rabi season at All India Co-ordinated Research Project on Vegetable Crops, Department of Horticulture, Mahatma Phule Krishi Vidyapeeth Rahuri, Dist- Ahmednagar (M.S).

The observation were recorded on qualitative as well as yield contributing characters viz., number of pods per vine, number of grains per pod, weight of ten pods (g), days required from pod setting to edible maturity, dry grain yield per plot, dry grain yield per hectare and per cent protein content in green as well as in dry grains. The variations among these ten genotypes were observed for all characters studied.

Genotype RHRDBP-10 recorded the highest number of pods per vine (226.6). The genotype RHRDBP-5 was recorded significantly highest number of grains per pod (4.29), while the genotype RHRDBP-8 recorded significantly highest weight of 10 pods (56.76 g). The genotype RHRDBP-1 exhibited the minimum days required from fruit setting to edible maturity (11.33 days). The genotype RHRDBP-10 significantly recorded the highest dry grain

yield per plot (1776.67 g) as well as recorded highest per hectare (47.36 q) followed by RHRDBP-9. The genotype HRDBP-5 showed the highest protein (21 %) content while it was least in RHRDBP- The genotypes viz., RHRDBP-10 and RHRDBP-9 were found better for higher yield.

Key words: Dolichos bean, genotypes, quality and yield characters, protein

INTRODUCTION

Dolichos bean (*Dolichos lablab* L.) is also called as Indian bean originated in India. It belongs to the family Fabaceae Sub Family Papilionoideae, having chromosome No. $2n = 22$. Lablab is also referred to as an 'orphan legume' an 'underutilized crops' having high nutritional qualities, heat and drought tolerant.

In India, Karnataka alone is contributing nearly *ninety per cent* of both area and production of dolichos bean. The rest area is concentrated in nearby district of Tamilnadu, A.P. and Maharashtra. It is used as a vegetable, pulse, forage, and green manure crop.

India being the centre of origin, there is a great range of variability with different plant and pod characters of pole type dolichos bean (*Lablab purpureus* var. *typicus*) grown all over the country and that variability can be exploited for evolving a high yielding type. The evaluation of the potentialities of the existing varieties is very essential for further crop improvement. A wide range of variability exists in qualitative

characters as well as yield and yield contributing characters.

The beans are naturally rich in carbohydrates, proteins, fat and fibers as well as minerals including calcium, phosphorus and iron (Naeem *et al.* 2009). Among the legumes, dolichos bean constitutes an important source of therapeutic agents used in the modern as well as traditional systems of medicine (Morris 2003 and Morris 2009). The composition of green pods of dolichos bean per 100 g of edible portion, 86.1 g moisture, 3.8 g protein, 0.7 g fat, 6.7 g carbohydrates, 68.0 mg phosphorous, 1.7 mg iron and 210.0 mg calcium. It also contain traces of Thiamine 0.1 mg, Niacin 0.7 mg, Ribo-flavin 0.06 mg. It is rich source of vitamin A (617.0 I.U.) nutritional factors and other physical characteristics.

Apart from the nutrients, the lablab beans, as is the case with other legume grains, may also contain varying amounts of antinutritional factors such as tannins, phytic acid and trypsin inhibitors. These anti-nutrients reduce the absorption and

bioavailability of nutrients in legume grains (Makokha *et al.*, 2002 and Shaahu *et al.*, 2015).

MATERIALS AND METHODS

The present investigation was carried out at All India Coordinated Research Project on Vegetable Crops, Department of Horticulture, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra. The experimental material consists of ten genotypes (Table 1.) which were received

from Senior Vegetable Breeder AICRP on Vegetable Crops, MPKV, Rahuri. The selected genotypes were sown in Randomized Block Design with three replication. Each genotype was sown in a row with an inter row spacing of 0.75 m and interplant spacing of 1.0 m. All the agronomic practices and plant protection measures were uniformly followed as and when required.

Table 1: Name of genotypes and their sources

S.N.	Name of Genotype	Source
1.	RHRDBP 1	AICRP (VC), Rahuri
2.	RHRDBP 2	AICRP (VC), Rahuri
3.	RHRDBP 3	AICRP (VC), Rahuri
4.	RHRDBP 4	AICRP (VC), Rahuri
5.	RHRDBP 5	AICRP (VC), Rahuri
6.	RHRDBP 6	AICRP (VC), Rahuri
7.	RHRDBP 7	AICRP (VC), Rahuri
8.	RHRDBP 8	AICRP (VC), Rahuri
9.	RHRDBP 9	AICRP (VC), Rahuri
10.	RHRDBP 10	AICRP (VC), Rahuri

RESULTS AND DISCUSSION

The data on various observations recorded during experimentation were subjected to statistical analysis in Randomized Block Design in order to find out the significance of different treatments by using the analysis of variance. Dolichos bean is one of the important pulse crop of Maharashtra grown in *rabi* season on residual moisture.

Mean performance

The observations recorded are depicted in the table 2 and 3 revealed that all the genotypes

exhibited large amount of variability for all most all parameters studied. The mean performance for eight characters in ten genotypes of dolichos bean has presented as follows:

1. Number of pods per vine

Number of pods per vine ranged from 134 (RHRDBP-2) to 226.6 (RHRDBP-10) (Table.2). The genotype RHRDBP-10 recorded the highest number of pod per vine which was at par with genotype RHRDBP-9 (216.67), RHRDBP-5 (201.3) and RHRDBP-1 (200). Out of ten genotypes studied, four

genotypes showed (40%) more number of pods per vine than population means (181.20). Barua *et al.* (2014) and Gupta *et al.* (2017) were reported similar types of results, and supported the present findings

2. Number of grains per pod

Number of grains per pod ranges between 3.65 (RHRDBP-6) to 4.29 (RHRDBP-5) (Table 2). The genotype RHRDBP-5 (4.29) recorded the significantly highest number of grains per pod followed by RHRDBP- 4 (4.03), RHRDBP-1 (4.01) which were second best for this trait. The four genotypes out of ten showed more number of grains per pod than population means (3.91). Similar results have been reported by Joshi and Rahewar (2015) and Gupta, *et al.* (2017).

3. Weight of ten pods (g)

The population mean for this character was 49.67 g. and the values of ten pod weight were ranging in between 43.28 g (RHRDBP-3) to 56.79 g (RHRDBP-8) (Table 2). The genotype RHRDBP-8 (56.79 g) was exhibited significantly highest weight of ten pods and which was at par with genotypes RHRDBP-10(56.24 g), RHRDBP-4 (53.60 g). Out of ten genotypes studied five exhibited significantly higher weight than mean population (49.67 g).

It might be due to the genetic

nature of plants or its environmental reaction with the plant which resulted in to better development of longer reproductive phases and protein synthesis, and thus finally promoting pod weight. The findings are in agreement with the findings of Parmar *et al.* (2013), Sharma *et al.* (2014) and Das *et al.* (2015).

4. Days require from pod setting to edible maturity.

Days require from pod setting to edible maturity ranges from 11.33 days (RHRDBP-1) to 17 days (RHRDBP-7) (Table 2). The genotype RHRDBP-1 (11.33 days) exhibited the minimum days for this trait followed by RHRDBP-9 (13.00 days), RHRDBP-4 (14.00 days) and RHRDBP-3 (14.33). Out of ten genotypes studied five genotypes exhibited earliness in days require from pod setting to edible maturity than mean population (14.70 days). Similar results were also observed by Barua *et al.* (2014), Sharma *et al.* (2014) and Patil *et al.* (2017).

5. Dry grain yield per plot (kg)

Dry grain yield per plot ranged from 880 g (RHRDBP-2) to 1776.67 g (RHRDBP-10) (Table 3). The genotype RHRDBP-10 (1776.7 g) showed the highest dry grain yield per plot followed by RHRDBP-9 (1336.67 g), RHRDBP-1 (1233.33 g) and RHRDBP-8 (1225 g). The

genotype RHRDBP-2 (880 g) showed the lowest dry grain pod yield per plot followed by genotypes RHRDBP-3 (926.67 g), RHRDBP-6 (943.33 g) and RHRDBP-7 (1050 g). Out of ten genotypes studied six genotypes were exhibited significantly higher dry pod yield per plot than mean population (1178 g). The findings of this study corroborate with the results obtained by Sharma *et al.* (2014) and Prakash *et al.* (2015).

14. Dry grain yield per hectare (q)

Dry grain yield per hectare ranged from 23.46 q (RHRDBP-2) to 47.36 q (RHRDBP-10) (Table 3). The genotype RHRDBP-10 (47.36 q) showed the highest dry grain yield per hectare followed by RHRDBP-9 (35.63 g), RHRDBP- 1 (32.88) and RHRDBP-8 (32.65 q). Out of ten genotypes six genotypes were exhibited significantly higher dry pod yield per plot than mean population (31.41 q). The findings of this study corroborate with the results obtained by Sharma *et al.* (2014) and Prakash *et al.* (2015).

Table 2: Mean performance of genotypes for number of pods per vine, number of grains per pod, weight of ten pods (g) and days required from pod setting to edible maturity

S.N.	Genotypes	Number of pods per vine	Number of grains per pod	Weight of ten pods (g)	Days required from pod setting to edible maturity
1.	RHRDBP -1	200.00	4.01	45.31	11.33
2.	RHRDBP -2	134.00	3.91	51.80	16.33
3.	RHRDBP -3	172.00	3.92	43.28	14.33
4.	RHRDBP -4	160.00	4.03	53.60	14.00
5.	RHRDBP -5	201.33	4.29	45.55	15.00
6.	RHRDBP -6	162.67	3.65	47.85	15.33
7.	RHRDBP -7	174.67	3.84	44.72	17.00
8.	RHRDBP -8	164.00	3.76	56.79	16.00
9.	RHRDBP -9	216.67	3.89	51.52	13.00
10.	RHRDBP- 10	226.67	3.80	56.24	14.67
	Mean	181.20	3.91	49.67	14.70
	S.E. \pm	9.38	0.087	1.37	0.84
	CD @ 5 %	27.88	0.25	4.09	2.51
	CV (%)	8.97	3.87	4.80	9.97

Table 3: Mean performance of genotypes for dry grain yield per plot (g), dry grain yield per hectare (q), Protein content (%) in green seed, and Protein content (%) in dry seed

S.N.	Genotypes	Dry grain yield per plot (g)	Dry grain yield per hectare(q)	Protein content (%) green seed	Protein content (%) dry seed
1.	RHRDBP -1	1233.33	32.88	9.63	17.21
2.	RHRDBP -2	880.00	23.46	9.92	14.00
3.	RHRDBP -3	926.67	24.72	11.38	14.88
4.	RHRDBP -4	1223.33	32.59	9.04	15.46
5.	RHRDBP -5	1190.00	31.72	14.87	21.00
6.	RHRDBP -6	943.33	25.13	8.17	14.58
7.	RHRDBP -7	1050.00	27.99	10.21	16.62
8.	RHRDBP -8	1225.00	32.65	11.08	17.50
9.	RHRDBP -9	1336.67	35.63	9.60	17.21
10.	RHRDBP- 10	1776.67	47.36	14.29	20.13
	Mean	1178.50	31.41	10.82	16.86
	S.E. \pm	17.86	0.48	0.38	0.30
	CD @ 5 %	53.06	1.43	1.14	0.90
	CV (%)	2.62	2.65	1.57	1.24

15. Qualitative characters

1. Protein content % (Green seed)

Protein content of green seed ranged from 8.17 per cent (RHRDBP-6) to 14.87 per cent (RHRDBP-5) (Table 3). The genotype RHRDBP-5 (14.87%) showed the highest green seed protein content among the all genotypes except RHRDBP-10 (14.29%) which was at par. Out of ten genotypes four genotypes were exhibited significantly higher green seed protein content than population means (14.87). The genotype RHRDBP-5 showed the highest green seed protein content among the all genotypes except RHRDBP-10 which was at par. The RHRDBP-6 recorded lowest green seed protein content (8.17). The result obtained in present study were in close agreement with those reported by Patil *et al.* (2017)

16. Protein content % (Dry seed/grains)

Protein content of dry seed ranged from 14.58 per cent (RHRDBP-2) to 21 per cent (RHRDBP-5) (Table 3). The genotype RHRDBP-5 (21%) showed the highest protein content among all genotypes except RHRDBP-10 (20.13%) which was at par. The RHRDBP-2 (14.58 %) recorded lowest protein content followed by RHRDBP-6 (8.17%) and RHRDBP-9 (9.60%). Out of ten genotypes five genotypes (50%) exhibited significantly higher protein content than

population mean. The result obtained in present study was in close agreement with those reported by Patil *et al.* (2017).

CONCLUSION

On the basis of present investigation, it is concluded that the dolichos bean genotype RHRDBP-10 responded well in terms of yield parameters and adjudged suitable for commercial production. The genotype RHRDBP-10, RHRDBP-9 and RHRDBP-8 showed the best yield parameters *i.e.* significantly the maximum number of pods per vine.

On the basis of present investigation, it is also concluded that the dolichos bean genotype RHRDBP-3 responded well in terms of growth parameters like no. of flowers /inflorescence, no of pods /inflorescence and *per cent* of pod setting the maximum green pod yield and dry seed yield per hectare was obtained from RHRDBP-10 and RHRDBP-9. The genotype RHRDBP-5 recorded highest protein *per cent* and number of grains per pod.

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