

# Studies on Green POD Yield and Yield Contributing Characters of Dolichos Bean (*Dolichos Lablab*) Genotypes (Pawata Type) Under Western Maharashtra Conditions

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**Abstract:** The present investigation was under taken to study the genotypes of dolichos bean for yield and quality characters among ten genotypes of dolichos bean 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 green pod yield of as well as yield contributing characters viz., number of flowers/ inflorescence, number of pods/inflorescence, pod setting (%), pod length (cm), pod width (cm), green pod yield per plant (g), green pod yield per plot (kg) and green pod yield per hectare (q). The variations among ten genotypes were observed for the above studied characters. The genotype RHRDBP-3 recorded significantly highest number of flowers (21.18) as well as highest number of pods (9.03) per inflorescence. The genotype RHRDBP-5 was recorded the significantly highest pod setting percentage (50.77 %) and significantly highest pod width (1.75 cm). The genotype RHRDBP-1 recorded significantly highest pod length (4.58 cm) than rest of the characters studied. The genotype RHRDBP-10 significantly recorded the highest green pod yield (1274.4 g) per plant, per plot (6.37 kg) and per hectare (169.93 q) than any other genotypes.

**Keywords:** Dolichos bean, genotypes, green pods and yield characters

## 1. 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 Tamil nadu, A.P. and Maharashtra. It is used as a vegetable, pulse, forage, and also 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 green pod yield and yield contributing characters.

Apart from the nutrients, the lablab beans, as is the case with other legume grains, may also contain varying amounts of anti-nutritional factors such as tannins, phytic acid and trypsin inhibitors. These anti-nutrients reduce the absorption and bioavailability of nutrients in legume grains. (Shaahu *et al.*, 2015.)

## 2. 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 replications. 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.

## 3. 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.

### 3.1 Mean performance

The mean performance for eight characters in ten genotypes of dolichos bean has presented as follows:

#### 1) Number of flowers per inflorescence

The values of number of flowers per inflorescence ranged between 7.81 (RHRDBP-5) to 21.18 (RHRDBP-3) (Table.1). The genotype RHRDBP-3 (21.18) showed highest number of flower per inflorescence followed by RHRDBP-4 (18.59), RHRDBP-1 (18.23) and RHRDBP-10 (18.08). The genotype RHRDBP-3 is superior over the other genotype. Similar reports were observed by Das *et al.* (2015), Patil *et al.* (2017) and Gupta *et al.* (2017).

**Table 1:** Mean performance of genotypes for number of flowers per inflorescence, number of pods per inflorescence, pod setting (%) and pod length (cm)

S.N.	Genotypes	Number of flowers per inflorescence	Number of pods per inflorescence	Pod setting (%)	Pod length (cm)
1.	RHRDBP -1	18.23	8.37	45.96	4.58
2.	RHRDBP -2	16.79	7.40	44.07	4.23
3.	RHRDBP -3	21.18	9.03	42.70	4.25
4.	RHRDBP -4	18.59	8.60	46.24	3.44
5.	RHRDBP -5	7.81	3.96	50.77	3.40
6.	RHRDBP -6	8.79	4.04	46.09	3.34
7.	RHRDBP -7	8.90	4.47	50.51	4.32
8.	RHRDBP -8	9.33	4.53	48.60	4.29
9.	RHRDBP -9	13.09	6.48	50.13	4.16
10.	RHRDBP -10	18.08	8.72	48.27	4.25
	Mean	14.08	6.56	47.33	4.03
	S.E.±	0.54	0.21	1.42	0.071
	CD @ 5 %	1.61	0.64	4.24	0.212

## 2) Number of pods per inflorescence

The values for number of pods per inflorescence ranges between 3.96 (RHRDBP-5) to 9.03 (RHRDBP-3) (Table.1). The genotype RHRDBP-3 (9.03) recorded the highest number of pods per inflorescence than all other genotypes except RHRDBP-4 (8.60) which was at par and formed second best for this trait. Out of ten genotypes studied five genotypes (50 %) were recorded more number of pods per inflorescence than population means 6.56. Similar results have been reported Barua *et al.* (2014) and Patil *et al.* (2017).

## 3) Pod setting (%)

Pods setting percentage was ranged from 42.70% (RHRDBP-3) to 50.77 % (RHRDBP-5) (Table 1). The genotype RHRDBP-5 (50.77%) recorded the significantly highest per cent pod setting which was at par with genotypes RHRDBP-7 (50.51%), RHRDBP-9 (50.13%), RHRDBP-8 (48.60 %) and RHRDBP-10 (48.27 %). Out of ten genotypes five genotypes (50%) showed highest of pod setting percentage than population mean (47.33%). Variation in percent pod setting might be due to the inherent genetic makeup of the genotype or its environmental reaction which accelerates the growth and development reproductive phases and protein synthesis and thus promoting yield attributing characters. Similar results have been reported by Ravinaik *et al.* (2015), Patil *et al.* (2017) and Gupta *et al.* (2017).

## 4) Pod length (cm)

The pod length was ranges from 3.34 cm (RHRDBP-6) to 4.58 cm (RHRDBP-1) (Table 1). The genotype RHRDBP-1 (4.58 cm) showed the significantly the highest pod length followed by RHRDBP-7 (4.32 cm). Among the ten genotypes, seven genotypes (70%) were recorded higher pod length than population means (4.03 cm). The variation in pod length has been due to genetic nature and environmental factor, resulting in enhancing pod length. Similar results have been reported Sharma *et al.* (2014), Barua *et al.* (2014), Ravinaik *et al.* (2015) and Das *et al.* (2015).

## 5) Pod width (cm)

The pod width ranges between 1.23 cm (RHRDBP-2) to 1.75 cm (RHRDBP-5) (Table 2). The genotype RHRDBP-5 (1.75 cm) showed the highest pod width which was at par with genotype RHRDBP-10 (1.74 cm). Out of ten genotypes studied three genotypes showed more pod width than population mean (1.45cm). The Similar results have been reported by Barua *et al.* (2014) and Radhelal *et al.* (2017).

**Table 2:** Mean performance of genotypes for pod width (cm), green pod yield per plant (g), green pod yield per plot (kg) and green pod yield per ha. (q)

S.N.	Genotypes	Pod width (cm)	Green pod yield per plant (g)	Green pod yield per plot (kg)	Green pod yield per hectare (q)
1.	RHRDBP -1	1.34	905.60	4.53	120.69
2.	RHRDBP -2	1.23	692.77	3.57	90.80
3.	RHRDBP -3	1.35	744.43	3.72	99.18
4.	RHRDBP-4	1.36	857.60	4.29	114.29
5.	RHRDBP -5	1.75	921.55	4.61	122.80
6.	RHRDBP -6	1.44	777.87	3.89	103.67
7.	RHRDBP -7	1.32	774.79	3.87	103.14
8.	RHRDBP -8	1.54	939.83	4.66	124.15
9.	RHRDBP -9	1.43	1112.83	5.56	148.33
10.	RHRDBP -10	1.74	1274.40	6.37	169.93
	Mean	1.45	900.17	4.51	119.70
	S.E.±	0.012	8.98	0.067	1.32
	CD @ 5 %	0.037	26.68	0.20	3.94

## 6) Green pod yield per plant (g)

Green pod yield range from 692.77g (RHRDBP-2) to 1274.40g (RHRDBP-10) (Table 2). The genotype RHRDBP-10 (1274.40 g) significantly recorded the highest green pod yield per plant followed by RHRDBP-9 (1112.83 g). The genotype RHRDBP-2 (692.77 g) mentioned the lowest green pod yield per plant. For green pod yield per plant 5 genotypes (50%) had significantly higher green pod yield per plant than that of population mean (900.17 g). The variation in pod yield per plant might be due to pod setting percentage, pod length, number of pods per plant, pod weight, genetic nature, environmental factor and vigour of the crop. Similar finding was in agreement with their results obtained by Sharma *et al.* (2014), Ravinaik *et al.* (2015) Das *et al.* (2015) and Radhelal *et al.* (2017).

## 7) Green pod yield per plot (kg)

Green pod yield per plot ranged from 3.57 kg (RHRDBP-2) to 6.37 kg (RHRDBP-10) (Table 2). The genotype RHRDBP-10 (6.37 kg) showed the highest green pod yield per plot followed by RHRDBP- 9 (5.56 kg). The genotype RHRDBP-2 (3.57 kg) showed the lowest green pod yield per plot followed by genotypes RHRDBP-3 (3.72 kg). Out of 10 genotypes 5 (50%) genotypes exhibited significantly higher green pod yield per plot than population mean (4.51 kg).

The yield increasing due to branching, more number of leaves, more number of pods, pod weight. These characters favour to the maximum converting in yield of climber and

also genetical characters of climber. The findings corroborate with the results obtained by Ravinaik *et al.* (2012), Sharma *et al.* (2014), and Radhelal *et al.* (2017).

#### 8) Green pod yield per hectare (q)

Green pod yield ranged from 90.80 q/ha (RHRDBP-2) to 169.93 q/ha (RHRDBP-10.) (Table 2). The RHRDBP-10 (169.93 q) recorded significantly the highest green pod yield per hectare. The genotype RHRDBP-2 (90.80 q) exhibited the lowest yield per hectare. Fifty *per cent* genotypes exhibited significantly higher green pod yield per hectare than population mean. The yield of any crop is the final index of the experiment which indicates the success or failure of any treatment with this view, the pod yield of dolichos bean was recorded. The data for the pod yield per hectare under different genotypes were recorded and converted into pod yield (q) per ha. The variation in pod yield might have been due to various yield attributing traits such as number of pods per plant, yield per plant and yield per plot. Genetic nature of the different genotypes and uniform micro climate availability that influence on the availability of macro and micro nutrients resulting the higher yield and its attributing traits. The findings of this study corroborate with the results obtained Sharma *et al.* (2014), and Radhelal *et al.* (2017).

#### 4. 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.

Significantly the maximum green pod yield and per hectare was obtained from RHRDBP-10 and RHRDBP-9. The genotype RHRDBP-5 recorded highest protein *per cent*.

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