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## Evaluation of genotypes of Dolichos bean (*Dolichos lablab* L.) for phenological characters

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### Abstract

An research programme entitled “Evaluation of genotypes of Dolichos bean (*Dolichos lablab* L.)” was carried out at All India Coordinated Research Project on Vegetable Crops, Mahatma Phule Krishi Vidyapeeth, Rahuri, Dist. Ahmednagar (MS), conducted during the year 2021-2022 with objective to study the different Dolichos bean genotypes for their morphological characters, yield and yield attributing characters. The genotypes were evaluated during *kharif*- 2021 in RBD with three replications. The experimental material for present investigation comprised of 8 genotypes along with one standard check Phule Gauri. The observation recorded for leaf shape, vine length, number of primary branches, days to flowering, days to 50% flowering, number of flower buds per raceme, number of pod per cluster, fresh pod length, fresh pod width, number of fresh pod per vine, days to first pod harvest, number of seeds per pod, average weight of fresh pod, fresh pod yield per plot, fresh pod yield per vine, fresh pod protein content and carbohydrates content. Mean performance of most of the genotypes was superior than mean performance of the standard check “Phule Gauri”. During evaluation of genotypes morphological and qualitative variation were observed in some characters *viz.*, flower bud colour, fresh pod colour (green, light green and green with purple tinge) and fresh pod shape (slightly curved, flat and slightly curved round).

**Keywords:** Dolichos bean genotypes, phenological characters and morphological parameters

### Introduction

Dolichos bean (*Dolichos lablab* var. *typicus*),  $2n = x = 22$ , belongs to family Leguminaceae known as Indian bean, sem bean, Egyptian kidney bean, Bonavist bean, Avari and varichikudi is the most popular traditional vegetable. It is originated from India. It is bushy, semi erect and pole type, herbaceous self-pollinated crop. It is mostly grown as rainfed crop for fresh beans for use as a vegetable throughout the tropical region of Asia, Africa and America. It's green pods (100 g) contain 6.7 g Carbohydrates, 3.8 g Protein, 210 mg Ca, 1.7mg Fe, 312 IU vitamin A and 0.1mg Thiamine (Gopalan *et al.*, 2004) [2]. India has 227.78-hectare area under Dolichos bean with 2,276.95 metric tonnes vegetable bean production and 10 metric tonne /ha productivity (Anonymous, 2020-21) [1].

Depend on the shape and texture of the pods and the angle of attachment of seeds to the suture of the pods, two botanical types of dolichos beans are recognized one is *Lablab purpureus* var. *typicus* and other is *Lablab purpureus* var. *lingosus*. In that *Lablab purpureus* var. *typicus* produces pods are flat, longer and more tapering with long axis of seeds parallel to the suture of the pod. It has a twining habit that's why need a staking. On the other hand, *Lablab purpureus* var. *lingosus* is annual type. It bears tough firm walled parchmented pod which are short in shape and more abruptly truncated and long axis of the seeds is perpendicular to the suture of the pod.

The most of the Vegetarian Population in India consumes large amounts of legumes, particularly vegetable beans in their diet dolichos bean constitutes an important source of therapeutic agents used in the modern as well as traditional systems of medicine. Dolichos bean is an arid region crop which grown in limited water availability. The crop mostly grown in cool season and sowing done in July-August. It starts fruiting in winter and continues to grow indeterminately in the following spring. Despite having many good attributes, the crop has remained poorly exploited owing to low productivity, long duration, photo-sensitivity and indeterminate growth habit. The efforts of improving the crop by utilizing indigenous and exotic germplasm have been useful in breaking the yield barriers resulting in compact plant type, reduced duration, photo-insensitivity and high yielding types (Shilvashankar and Kulkarni, 1989) [6].

It is used as a multipurpose crop since it is used for food, forage, soil improvement, soil protection and weed control (Shilvashankar and Kulkarni, 1989) [6]. The protein content of pods and seeds ranges from 10-19% and 15-25% resp. In India, the major field bean growing areas are Karnataka, Tamil Nadu and Telangana.

### Materials and Methods

The present experiment entitled "Evaluation of Genotypes of Dolichos Bean (*Dolichos lablab* L.)" was carried out at All India Coordinated Research Project on Vegetable Crops, Department of Horticulture, MPKV, Rahuri. The basic material for the study involved 9 genotypes of dolichos bean were grown in RBD plot design with three replications during Kharif season 2021- 2022. The spacing adopted was 1.5m x 1m row to row and plant to plant.

### Treatment Details

#### Treatment No. Treatment details

T <sub>1</sub>	RHRMDBP1
T <sub>2</sub>	RHRMDBP2
T <sub>3</sub>	RHRMDBP3
T <sub>4</sub>	RHRMDBP4
T <sub>5</sub>	RHRMDBP5
T <sub>6</sub>	RHRMDBP6
T <sub>7</sub>	RHRMDBP7
T <sub>8</sub>	RHRMDBP8
T <sub>9</sub>	Phule Gauri

### Results and Discussion

The study of various genotypes of various dolichos bean genotypes are presented in Table 1 the result concluded that difference due to various genotypes were highly significant for all the parameters under study.

Among the different genotypes studied, The maximum length of vine (572.00 cm) was recorded in RHRMDBP5, whereas minimum vine length was noticed in RHRMDBP7 (450.00

cm) similar findings for maximum vine length were reported by Khan *et al.* (2010) max number of branches (7.40) was observed in treatment RHRMDBP1, while min in treatment RHRMDBP7 (4.40) same results were reported by Ravinaik *et al.* (2015) [5], minimum days require for flowering (50.00 days) was noticed in treatments in treatment RHRMDBP1 whereas maximum days required for flowering was noticed in Phule Gauri (71.00 days) These results for days to first flowering were in corresponding with Pan *et al.* (2004) [4].

**Table 1:** Morphological parameters of genotypes of dolichos bean

Treatment	Treatment details	Vine length (cm)	No of branches per vine	Day s to first flowering
T <sub>1</sub>	RHRMDBP1	490.00	7.40	50.00
T <sub>2</sub>	RHRMDBP2	552.00	6.45	55.00
T <sub>3</sub>	RHRMDBP3	529.00	7.20	52.00
T <sub>4</sub>	RHRMDBP4	472.00	5.60	57.00
T <sub>5</sub>	RHRMDBP5	572.00	5.20	58.00
T <sub>6</sub>	RHRMDBP6	562.00	6.50	52.50
T <sub>7</sub>	RHRMDBP7	450.00	4.40	62.50
T <sub>8</sub>	RHRMDBP8	488.00	5.00	60.00
T <sub>9</sub>	Phule Gauri	524.00	5.20	71.00
	S.E(m)±	20.63	0.20	2.09
	CD at 5%	61.87	0.60	6.26
	C.V.	6.93	5.97	6.29

The result of the present investigation for days to 50% flowering, Days to first pod harvest and number of flowers / cluster are presented in Table 2 significantly early in treatment RHRMDBP1(62.50 and 75.50 days resp.) and Significantly maximum number of flowers in treatment RHRMDBP3 (59.40) whereas late flowering and days to first pod harvest in check Phule Gauri (85.00 and 96.00 days) and minimum number of flowers in treatment RHRMDBP4 (49.27) results accordance with Upadhyay and Mehta (2010) [7].

**Table 2:** Phenological parameters of genotypes of dolichos bean

Treatment	Treatment Details	Days to 50% flowering	Dayss to first pod harvest	No of flowers per cluster
T <sub>1</sub>	RHRMDBP1	62.50	75.50	52.80
T <sub>2</sub>	RHRMDBP2	64.00	78.00	54.53
T <sub>3</sub>	RHRMDBP3	65.50	81.50	59.40
T <sub>4</sub>	RHRMDBP4	64.83	77.50	49.27
T <sub>5</sub>	RHRMDBP5	68.33	80.00	54.93
T <sub>6</sub>	RHRMDBP6	66.50	83.50	55.67
T <sub>7</sub>	RHRMDBP7	77.56	88.55	50.20
T <sub>8</sub>	RHRMDBP8	75.00	87.50	56.40
T <sub>9</sub>	Phule Gauri	85.00	96.00	51.53
	S.E(m)±	3.14	3.13	1.94
	CD at 5%	9.43	9.39	5.82
	C.V.	7.79	6.58	6.24

The data recorded for leaf shape, fresh pod colour, flower colour and fresh pod shape by visual observation is presented in Table 3. All the genotypes of dolichos bean recorded ovate type leaf shape. The genotypes RHRMDBP1, RHRMDBP4, RHRMDBP6 and RHRMDBP8 showed purple colour flower and RHRMDBP2, RHRMDBP3, RHRMDBP5, RHRMDBP7 and Phule Gauri showed white colour flower. Fresh pod colour, light green colour showed in RHRMDBP1,

RHRMDBP3, RHRMDBP5, RHRMDBP8 and Phule Gauri while green colour in RHRMDBP2, RHRMDBP4, RHRMDBP7 and green with purple tinge in RHRMDBP6.

Slightly curved, flat shape pods found in RHRMDBP1, RHRMDBP3, RHRMDBP4, RHRMDBP8 and Phule Gauri and slightly curved, round shape in RHRMDBP2, RHRMDBP5, RHRMDBP6 and RHRMDBP7. Above result similar with Mohan *et al.* (2014) [3].

**Table 3:** Qualitative parameters of genotypes of dolichos bean

Treatment	Treatments	Leaf Shape	Flower bud colour	Fresh pod colour	Fresh pod shape
T <sub>1</sub>	RHRMDBP1	Ovate	Purple	Light Green	Slightly Curved, Flat
T <sub>2</sub>	RHRMDBP2	Ovate	White	Green	Slightly Curved, Round
T <sub>3</sub>	RHRMDBP3	Ovate	White	Light Green	Slightly Curved, Flat
T <sub>4</sub>	RHRMDBP4	Ovate	Purple	Green	Slightly Curved, Round
T <sub>5</sub>	RHRMDBP5	Ovate	White	Light Green	Slightly Curved, Flat
T <sub>6</sub>	RHRMDBP6	Ovate	Purple	Green with purple tinge	Slightly Curved, Round
T <sub>7</sub>	RHRMDBP7	Ovate	White	Green	Slightly Curved, Round
T <sub>8</sub>	RHRMDBP8	Ovate	Purple	Light Green	Slightly Curved, Flat
T <sub>9</sub>	Phule Gauri	Ovate	White	Light Green	Slightly Curved, Flat

### Conclusion

The overall results on all morphological characters like length of vine (cm) showed that the genotype: RHRMDBP5 (572 cm) recorded significantly maximum vine length and minimum in RHRMDBP7. For number of primary branches per vine the genotype RHRMDBP1 (7.40) was recorded for significantly maximum and minimum for RHRMDBP7. The early flowering and days to first pod harvest recorded in RHRMDBP1.

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