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## Mean performance of dolichos bean (*Lablab purpureus* L.) genotypes for pod and seed yield Parameters

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**Abstract**

The present investigation was carried out at the Horticulture Research Farm, Department of Horticulture, Naini Agriculture School, SHUATS, Allahabad. The experiment was conducted in Randomized Block Design having thirty (genotypes) in three replications. The allocation of treatments of the individual plots using random number in each replications. Maximum green pod yield per plant was recorded in check PUSA SEM-2 which was followed by CG-21. Earliest flowering was recorded in genotypes CG-14 followed by CG-21. Earliest 50% flowering was recorded in genotypes CG-14 followed by CG-21. Highest inflorescence length was recorded in CG-17 followed by CG-26. Number of flowers per inflorescence was recorded maximum in CG-25 which was followed by CG-36. Maximum number of pod per inflorescence was recorded in PUSA SEM-2 followed by CG-21. The earliest first green pod harvest was recorded in CG-14 which was 60.66 days after sowing followed by CG-13 (86.66). The earliest last pod harvest was recorded in CG-15 followed by CG-5. Maximum number of green pod picking was recorded in CG-21 followed by PUSA SEM-2.

**Keywords:** Dolichos bean, mean performance, pod and seed yield

**Introduction**

Dolichos bean (*Lablab purpureus* L.) is an important leguminous vegetable grown throughout the country and is mainly grown for its green pods, while the dry seeds also used in various vegetable preparations. It is one of the major sources of protein in the preparations in India (Savitha *et al.*, 2012). Dolichos bean or Hyacinth bean or Egyptian bean or Sem (*Lablab purpureus* L.) is an important legume vegetable crop throughout India and distributed in Madhya Pradesh, Uttar Pradesh, Maharashtra, Chhattisgarh, Andhra Pradesh, Tamil Nadu and North Eastern states. It is known as poor's man bean (Ismunandji and Arsyad, 1990) [4]. Dolichos bean has chromosome number  $2n=2x=22$ . It is grown on almost all types of soil of average fertility as in case of other beans (Nath, 1976) [5]. It cannot stand waterlogging condition, but can stand with drought situation. It is sensitive to photoperiods and both short day and long day types are available (Anon, 1961). It is botanically known as *Lablab purpureus* Linn. "Dolichos" is a Greek word meaning "long" and "lablab" is an Arabic or Egyptian name meaning "dull rattle of the seed inside the dry pod" (Chaudhary, 1972). Vavilov (1939) [9] had considered India as the primary center of origin of Dolichos bean and wild forms are found in many parts of the country.

**Materials and Methods**

In the present investigation, 30 genotypes will be grown in the *kharif* seasons of 2016-17 at the field experimentation Centre of the Department of Horticulture, Sam Higginbottom University of Agriculture, Technology & Sciences, Allahabad (U.P.). Experimental materials for this study consist of 30 genotypes of dolichos bean (including check), collected from different sources are presented in Table 1. Five plants in each experimental plot were randomly selected plants. The selected plants were tagged for taking observations on various growth and yield contributing parameters. The picking of tender green pods was done at weekly intervals for vegetable purpose.

**Table 1:** Details of experimental materials

S. No.	Genotypes	No. of genotypes	Source of Genotypes
1.	CG 1, CG 2,CG 5,CG 6	4	Lundra Surguja CG
2.	CG 7, CG 8, CG 9	3	Ambikapur Surguja CG
3.	CG 3, CG 4.	2	Bilha, Bilashpur, CG
4.	CG 10, CG 11, CG 12, CG 13, CG 14, CG 15, CG 16.	7	Udaipur Surguja CG
5	CG. 17, CG 18.	2	Udagi Surajpur CG
6	CG 19, CG 28,	2	Lailunga Raigarh, CG
7	CG 20, CG 21, CG 22,	3	Ramanujnagar Surajpur CG
8	CG 23.	1	Bhaiyathan Surajpur CG
9	CG 24, CG 25, CG 26, CG 27.	4	Pathalgaon Jashpur CG
10	CG 29, CG 30,CG 31,CG 32,CG 33,CG 34,CG 35,CG 36	8	Reewagahan, Rajnandgaon CG
11	VRSEM-186	1	IIVR Varanasi,U.P.
12	PUSA SEM-2	1	IARI, Delhi

## Result

### Analysis of Variance

Data were recorded on 17 traits viz. days to first flowering, days to 50% flowering, inflorescence length, number of flowers per inflorescence, number of pods per inflorescence, days to first green pod harvest, days to last pod harvest, number of green pod picking, vine length, pod length, pod width, pod weight, number of seeds per pod, 100 seed weight, green pod yield per plant, green pod yield per plot, green pod yield per hectare were subjected to analysis of variance to test the significance of difference among the genotypes. Analysis of variance presented in showed that the genotypes differed significantly for all the 17 characters and the mean performance of 38 genotypes of dolichos bean are depicted in Table 2.

These findings are in general agreement with the findings of Pandita *et al.* (1980) [6], Wahabuddin *et al.* (1986) [10], Borah *et al.* (1992) [2], Bendal *et al.* (2008) [1], Upadhyay (2008) [8] and Patel (2010) [7].

**Table 2:** Analysis of variance for green pod yield and its components in dolichos bean

Character	Mean sum of square		
	Replication	Genotypes	Error
Days to first flowering	1.733	697.20 **	0.5724
Days to 50% flowering	3.233	762.45 **	1.049
Inflorescence length	1.70	112.08**	0.5512
No. of flowers per inflorescence	0.8941	31.26**	0.9768
Pods per inflorescence	0.0641	10.4015**	0.5691
Days to first pod harvest	1.411	768.19**	0.7789
Days to last pod harvest	0.233	308.877**	1.0034
No. of green pod pickings	0.1444	1.3444**	0.1444
Vine length	0.2201	2.51**	0.1237
Pod length	0.0748	11.26**	0.0246
Pod width	0.0001	1.1792**	0.0001
Pod weight	0.1594	11.9345**	0.0907
No. of seeds per pod	0.0534	1.0612**	0.1455
100 seed weight	1.1861	246.5982**	0.3815
YBMV incidence	64.8241	821.67**	48.85
Green pod yield per plant	0.0037	0.2778**	0.0124
Green pod yield per plot	0.1330	10.00**	0.4452
Pod yield (q/ha)	16.36	1234.039**	54.92

\* Significant at 5% level of probability

\*\* Significant at 1% level of probability

The results of mean performance for different cluster bean genotypes are presented in (Table 3 a&b, 4a&b). Earliest flowering was recorded in genotypes CG- 14 (46.2 days ) which was followed by CG-21( 72.6 days), CG- 13 (73.86 days) and on the other hand maximum days to flowering was

recorded in CG-10 (116.66 days), whereas check Pusa sem-2 appears first flowering in (95.8 days).

Earliest 50% flowering was recorded in genotypes CG- 14 (49.8 days) which was followed by CG-21 (76.26 days), CG-13(76.06 days), and on the other hand maximum days to 50% flowering was noted in CG-10 (118.33 days) whereas, check Pusa sem -2 appears 50% flowering in (99.93 days).

Inflorescence length ranged from 7.08 cm to 28.4 cm. Highest inflorescence length was recorded in CG-17 (28.4 cm) followed by CG-26 (28.25 cm), whereas, minimum length of inflorescence was recorded in CG-8 (7.08 cm) with overall mean of 19.13 cm and check Pusa sem -2 showed 21.22 cm.

Number of flower per inflorescence ranged from 9.86 to 20. Number of flower per inflorescence was recorded maximum in CG-5 (20) which was followed by CG-36(19.73) and CG-21 (17.86) whereas, minimum number of flower recorded in CG- 20(9.86) with, the general mean of 13.51 and check Pusa sem-2 (19.86).

Number of pods per inflorescence ranged from 4.33 to 10.93. Maximum number of pod per inflorescence was recorded in Pusa sem-2 (10.93) which was followed by CG-21(10.6) and CG-10 (9.6) whereas, minimum number of pod per inflorescence was recorded in CG-20 (4.33) with general mean of 6.91.

Days to first pod harvest ranged from 60.66 days to 133.66 days. The first pod harvest was recorded in CG-14 which was 60.66 days after sowing followed by CG-13 (86.66) and CG-21 (87.66 days) whereas, CG-16 was recorded 133.66 days for first pod harvest. The general mean for days to first pod harvest was 108.99 days after sowing.

Days to last pod harvest ranged from 175.66 days to 206.33days. The earliest last pod harvest was recorded in CG-15(175.66 days) followed by CG-5 (180.33 days) whereas late pod harvest was noticed in CG-11 (206.33 days).

Number of green pod picking ranged from 5 to 7.66. Maximum number of green pod picking was recorded in CG-21 (7.66) which was followed by CG-25 (7.33), minimum number of green pod picking was recored in CG-30 (5) and check Pusa sem-2 (6), with general mean of 6.04.

Pod length ranged from 3.85 to 13.02 cm. Maximum pod length was recorded in CG-27 (13.02 cm) followed by check Pusa sem -2 (12.93 cm), CG-28 (12.58 cm), whereas minimum pod length recorded in CG-31 (3.85 cm), with overall mean of 9.42 cm.

Pod width ranged from 1.37 cm to 4.22 cm. Maximum pod width was recorded in CG-20 (4.22 cm) followed by check CG-13 (2.64 cm) and Pusa sem-2 (2.53 cm) whereas, minimum pod width recorded in CG-1(1.37 cm) with overall mean of 1.95 cm.

Pod weight ranged from 2.47 gm to 11.35. Maximum pod weight was recorded in check Pusa sem -2 (11.35 gm), which was followed by CG-27 (10.77 g), CG-20 (10.53g) and lowest weight was recorded in 00CG-31 (2.47 g) with general mean (7.23 g).

Seeds per pod ranged from 3.11 to 6.30. Maximum seed per pod was recorded in CG-21 (6.30), followed by CG-16 (5.88), Minimum seed per pod was recorded in CG-31(3.11) with general mean 5.11. check Pusa sem- 2 recorded 5.5 seed per pod.

Vine length ranged from 4.46 m to 8.35 m. Maximum vine length was recorded in CG-12 (8.35 m) followed by CG-16 (7.13 m) and VRSEM-186(6.93 m). Minimum vine length was recorded in CG-07(4.46 m) with overall mean 5.80 m and check Pusa sem-2 was recorded 7.11 m vine length.

100 seed weight ranged from 22.46 g to 51.33 g. Maximum 100 seed weight was recorded in CG-16 (51.33 g) followed by CG-21 (46.5 g), check Pusa sem -2 (44.49 g) and Minimum 100 seed weight was recorded in CG-31 (22.46 g) with general mean 32.25g.

Pod yield per plant ranged from 0.92 kg to 2.23 kg. Maximum green pod yield per plant was recorded in check Pusa sem-2 (2.23 kg) which was followed by CG-21 (2.18 kg) and VRSEM- 186 (2.17 kg) whereas, minimum green pod yield per plant recorded in CG-31 (0.92 kg) with general mean of 1.71 kg.

Pod yield per plant ranged from 5.56 kg to 13.42 kg. Maximum green pod yield per plot was recorded in check Pusa sem-2 (13.42 kg) which was followed by CG-21 (13.1 kg) and VRSEM- 186 (13.06 kg) whereas, minimum green pod yield per plant recorded in CG-31 (5.56 kg) with general mean of 10.27 kg.

Pod yield per plant ranged from 61.77 q to 149.10 q. Maximum green pod yield per plot was recorded in check Pusa sem-2 (149.10 q ) which was followed by CG-21 (145.53 q) and VRSEM-186 (145.10 q) whereas, minimum green pod yield per plant recorded in CG-31 (61.77 q) with general mean of 114.19 q.

**Table 3a:** Mean performance of genotypes of dolichos bean for different characters

S. N.	Name of genotypes	Days to first flowering	Days to 50% flowering	Inflorescence length (cm)	No. of flowers per inflorescence	No. of pods per inflorescence	Days to first green pod harvest	Days to last green pod harvest	No. of green pod pickings	Vine length (m)
1	CG 1	90.33	98.00	19.78	11.67	3.29	108.33	196.33	7.00	5.43
2	CG 2	76.67	81.33	21.62	11.72	4.59	88.67	178.33	6.00	6.27
3	CG 3	97.00	106.00	9.33	9.90	3.72	113.00	190.33	7.00	4.47
4	CG 4	81.67	91.67	23.07	9.12	4.33	98.00	193.00	7.00	6.07
5	CG 5	92.00	100.67	22.43	17.48	5.37	106.67	178.00	7.00	4.73
6	CG 6	72.67	79.67	21.47	9.93	5.76	87.67	198.33	8.00	6.23
7	CG 7	92.67	99.67	11.00	10.00	3.27	105.33	178.33	7.33	4.07
8	CG 8	81.33	88.33	7.38	6.78	4.33	95.67	196.67	7.33	4.43
9	CG 9	101.33	111.33	11.55	7.43	4.76	116.67	180.33	7.00	6.00
10	CG 10	115.33	121.67	15.33	17.22	10.46	128.00	199.33	7.33	6.10
11	CG 11	100.33	111.00	28.07	14.57	6.00	116.00	207.33	8.00	6.23
12	CG 12	93.00	101.00	18.88	9.08	4.63	106.33	201.00	7.67	8.23
13	CG 13	72.33	78.33	25.68	11.30	4.33	83.67	195.00	7.67	5.43
14	CG 14	47.00	52.67	16.72	7.87	5.33	59.00	187.33	7.33	5.20
15	CG 15	108.00	119.00	16.33	8.67	6.00	126.00	170.67	6.00	5.20
16	CG 16	111.33	120.33	18.62	9.52	4.89	129.00	208.33	8.00	6.40
17	CG 17	98.00	107.33	29.93	14.43	5.33	114.33	205.33	8.00	4.83
18	CG 18	110.00	118.67	14.00	8.67	5.33	125.67	190.00	7.00	5.17
19	CG 19	90.67	99.33	15.02	9.13	6.60	104.67	199.00	7.33	5.53
20	CG 20	113.00	121.33	17.67	8.00	2.33	127.00	187.00	6.33	4.73

**Table 3b:** Mean performance of genotypes of dolichos bean for different characters

21	CG 21	70.33	80.67	13.47	5.65	7.53	87.00	201.67	8.67	5.60
22	CG 22	79.67	89.33	26.63	12.97	5.88	96.00	180.67	7.00	5.43
23	CG 23	93.33	98.67	14.78	7.75	4.00	104.67	178.33	6.33	4.93
24	CG 24	82.33	89.33	26.63	11.33	6.85	97.33	183.00	6.67	4.43
25	CG 25	100.33	109.00	24.93	8.55	5.33	115.67	191.33	7.00	6.17
26	CG 26	112.33	120.33	29.12	17.83	6.00	126.67	204.33	8.00	6.00
27	CG 27	86.67	91.00	14.28	7.60	4.55	97.00	184.33	7.33	4.20
28	CG 28	90.67	96.33	20.08	9.95	4.64	102.33	194.33	8.00	5.33
29	VRSEM 186	101.33	109.33	13.17	14.75	7.48	115.33	188.67	8.00	6.60
30	PUSA SEM 2	96.33	104.67	23.33	9.97	11.00	116.00	180.33	8.33	7.00
	Mean	91.93	99.87	19.01	10.63	5.47	106.59	190.90	7.32	5.55
	S.E.	0.44	0.59	0.43	0.57	0.44	0.51	0.58	0.22	0.20
	C.D. (5%)	1.24	1.67	1.21	1.62	1.23	1.44	1.64	0.62	0.57

**Table 4a:** Mean performance of genotypes of dolichos bean for different characters

S. No	Name of genotypes	Pod length (cm)	Pod width (cm)	Pod weight (g)	No. of seeds per pod	100 seed weight (g)	YBMV incidence (%)	Green pod yield per Plant (kg)	Green pod yield per plot (kg)	Pod Yield per hectare (q )
1	CG 1	9.07	1.40	5.51	4.43	28.33	38.89	1.45	8.68	96.43
2	CG 2	12.22	1.84	6.48	5.83	25.50	33.33	2.17	13.00	144.43
3	CG 3	8.46	1.46	5.83	5.10	19.33	33.33	1.53	9.20	102.21
4	CG 4	8.10	2.10	6.30	5.87	21.67	55.56	1.52	9.10	101.10

5	CG 5	8.14	2.29	6.30	4.50	24.33	61.11	1.73	10.36	115.10
6	CG 6	9.42	2.42	9.26	5.57	30.17	38.89	1.60	9.60	106.65
7	CG 7	7.54	1.47	6.46	5.93	24.17	27.78	1.33	7.98	88.66
8	CG 8	9.04	1.56	6.53	3.87	30.83	44.44	1.64	9.82	109.10
9	CG 9	10.25	2.28	7.52	4.83	25.50	33.33	1.97	11.80	131.09
10	CG 10	6.45	1.50	4.49	4.77	36.00	16.67	1.87	11.20	124.43
11	CG 11	8.88	1.29	6.31	5.10	23.67	44.44	1.69	10.12	112.43
12	CG 12	8.90	1.44	6.59	4.67	28.67	27.78	1.74	10.46	116.21
13	CG 13	9.85	2.61	10.22	5.17	26.00	38.89	1.78	10.70	118.88
14	CG 14	9.76	1.45	8.23	4.93	39.67	5.56	2.03	12.20	135.54
15	CG 15	9.12	1.43	4.82	4.23	20.17	38.89	1.32	7.90	87.77
16	CG 16	10.60	1.47	6.44	6.00	50.67	44.44	2.07	12.40	137.77
17	CG 17	8.78	1.54	6.07	5.10	37.50	50.00	1.76	10.54	117.10
18	CG 18	7.83	1.52	6.33	4.70	20.00	44.44	1.40	8.40	93.33
19	CG 19	11.34	2.28	5.40	5.50	45.50	16.67	2.23	13.38	148.65
20	CG 20	4.13	4.17	9.79	4.77	21.33	22.22	2.20	13.20	146.65

**Table 4b:** Mean performance of genotypes of dolichos bean for different characters

21	CG 21	11.21	1.40	6.88	5.57	48.17	5.56	2.25	13.50	149.99
22	CG 22	9.30	2.26	7.21	4.43	26.33	5.56	1.75	10.50	116.66
23	CG 23	8.04	1.42	6.11	3.93	28.67	33.33	1.70	10.18	113.10
24	CG 24	9.44	2.46	7.14	5.10	23.83	27.78	2.03	12.20	135.54
25	CG 25	8.53	1.60	6.06	4.50	26.67	38.89	1.78	10.70	118.88
26	CG 26	8.46	1.48	6.02	4.17	32.67	61.11	1.27	7.60	84.44
27	CG 27	13.12	2.47	11.32	5.33	44.00	16.67	1.87	11.20	124.43
28	CG 28	12.38	2.61	7.47	5.67	32.17	44.44	2.12	12.70	141.09
29	VRSEM-186	11.79	1.81	4.01	4.50	35.50	5.56	2.20	13.20	146.60
30	PUSA SEM-2	12.83	2.70	13.21	5.10	47.17	5.56	2.30	13.80	153.32
	Mean	9.43	1.92	7.01	4.97	30.81	32.04	1.81	10.85	120.59
	S.E.	0.09	0.00	0.17	0.22	0.36	4.04	0.06	0.39	4.28
	C.D. (5%)	0.26	0.01	0.49	0.62	1.01	11.42	0.18	1.09	12.11

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