



## EVALUATION OF BOTTLE GOURD [*LAGENARIA SICERARIA* (MOL.) STANDL.] GENOTYPES

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### Abstract

An experiment was conducted at Horticulture, Research cum Instructional Farm at Department of Horticulture, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.), India; during summer season 2013 to find out suitable bottle gourd genotype for earliness and yield under Chhattisgarh plains. Twenty two bottle gourd genotypes were evaluated for different quantitative characters. Analysis of variance revealed that mean sum of squares due to genotypes was highly significant for all characters. Among twenty two genotypes, the genotype 2012 BOG VAR 4 was noted for earliness (25 DAT) for days to 50% flowering and the same genotype was also noted for early male and female flowering *i.e.* 16.26 and 25.66 DAT. The genotype 2010 BOG VAR 3 exhibited early fruit setting (31.93 DAT) and also noted for early harvesting *i.e.* 41.33 DAT. Maximum number of fruits per plant (14.83) was recorded in NDBG 104. Studies revealed that the genotypes 2012 BOG VAR 6, 2012 BOG VAR 4, 2011 BOG VAR 3, 2010 BOG VAR 3 and NDBG 104 were found to be promising for earliness and fruit yield.

**Key words :** Bottle gourd, genotypes, earliness, fruit yield.

### Introduction

Bottle gourd [*Lagenaria siceraria* (Mol.) Standl.] belongs to the family cucurbitaceae having chromosome number  $2n = 22$ . Bottle gourd is one of the most important cucurbits cultivated in India. It is grown in rainy season and as well as summer season vegetable and its fruits are available in the market throughout the year. Bottle gourd is a rich source of minerals and vitamins. Tender fruits are used as cooked vegetable and also for making sweets. There is a vast scope for cultivation of bottle gourd in Chhattisgarh as there is a regular demand of crop for vegetable as well as for medicinal uses. It is highly remunerative crop which fetches sizeable income to the farmer within two or three months. However, the yield of bottle gourd in Chhattisgarh is not satisfactory enough in comparison with other cucurbit growing states due to less use of improved varieties. Thus, studies were conducted to evaluate the performance of some genotypes of the crop during summer season to identify promising and stable variety for production.

### Materials and Methods

The study was carried out during summer season (2013) at Horticulture Research cum Instructional Farm

at Department of Horticulture, IGKV, Raipur (C.G.), India. The experiment comprised of twenty two genotypes of bottle gourd *viz.*, 2012 BOG VAR 1, 2012 BOG VAR 2, 2012 BOG VAR 3, 2012 BOG VAR 4, 2012 BOG VAR 5, 2012 BOG VAR 6, 2012 BOG VAR 7, 2012 BOG VAR 8, 2011 BOG VAR 1, 2011 BOG VAR 2, 2011 BOG VAR 3, 2011 BOG VAR 4, 2011 BOG VAR 5, 2011 BOG VAR 6, 2011 BOG VAR 7, 2010 BOG VAR 1, 2010 BOG VAR 2, 2010 BOG VAR 3, 2010 BOG VAR 4, 2010 BOG VAR 5 along with two checks NDBG 104 and Pusa Naveen. The experiment was laid out in a Randomized Block Design with three replications at  $3.0 \times 0.5$  m row to row and plant to plant spacing. All the recommended cultural practices were adopted to raise a healthy crop. Data were recorded on five randomly selected plants with respect to characters *viz.*, days to first male and female flower appear, node number at which first male and female flower appear, days to 50% flowering, days to fruit set, number of branches per plant, days to first fruit harvest, fruit length (cm), average fruit weight (g), fruit girth (cm), number of fruits per plant, fruit yield (q/ha) and crop duration. The data were subjected to statistical and biometrical analysis (Singh and Chaudhary, 1985).

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**Table 1 :** Analysis of variance for fruit yield and its component characters in bottle gourd.

S. no.	Character (df)	Mean sums of square		
		Replication	Treatment	Error
		(2)	(21)	(42)
01.	Node no. at which 1st male flower appears	5.16	2.23*	0.32
02.	Node no. at which 1st female flower appears	0.018	6.91**	1.12
03.	Days to first male flower appears	1.51	50.33**	3.50
04.	Days to 1st female flower appears	2.3	38.7**	3.2
05.	Days to 50% flowering	7.85	51.31**	4.67
06.	Days to fruit set	4.2	30.8**	2.82
07.	Days to 1st fruit harvest	75.75	53.64**	16.3
08.	Fruit length (cm)	22.2	169.44*	9.1
09.	Fruit girth (cm)	0.18	11.1**	0.2
10.	Fruit weight (g)	2204.0	42854.4*	2591.65
11.	No. of fruits per plant	0.19	10.76*	1.12
12.	No. of branches per plant	0.018	2.41**	0.048
13.	Duration of crop (sowing to last harvest)	66.3	204.45**	43.18
14.	Yield (q/ha)	241.5	10986.10**	2021.6

\*: Significant at 5%, \*\*: significant at 1%.

## Results and Discussion

The analysis of variance of all the characters under study is presented in table 1. This analysis of variance revealed that mean sum of squares due to genotypes was highly significant for all characters. This is an indication of existence of sufficient variability among the genotypes for fruit yield and its components traits. Significant mean sum of squares due to fruit yield and attributing characters revealed existence of considerable variability in material studied for improvement for various traits. These findings are in general agreement with the findings of Pandit *et al.* (2009) and Bhardwaj *et al.* (2013).

The mean values of different growth and yield parameters with respect to genotypes are presented in table 2. The genotypes significantly differed for days to first male and female flower appear, days to 50% flowering, node number at which first male and female flower appear, days to fruit set, days to first fruit harvest, fruit length (cm), fruit girth (cm), number of branches per plant, fruit weight (g), number of fruits per plant, fruit yield (q/ha), crop duration. Significant early flowering for days to 50% flowering was noticed in 2012 BOG VAR 4 (25 DAT) while 2011 BOG VAR 7 (40.67 DAT) was found to be late in this respect. The genotype 2012/BOG VAR 4 produced early male and female flowering *i.e.*

16.26 and 25.66 DAT, respectively. Male flower was produced at lower nodes (2.33) in Pusa Naveen whereas, 2011 BOG VAR 3 produced female flower on the lower node (4.80). The genotype 2010/BOG VAR 3 exhibited early fruit setting (31.93 DAT) followed by 2011/BOG VAR 1 (33.20 DAT) and the same genotype also recorded early harvesting (41.33 DAT). The results are in agreement with that of Pandey and Singh (2007) in sponge gourd, Kumar *et al.* (1999) and Sirohi *et al.* (1988) in bottle gourd.

Higher number of branches was recorded in 2010/BOG VAR 2 (6.26). The length of fruit ranged from 10.19 cm in 2011/BOG VAR 4 to 35.36 cm in 2012/BOG VAR 3. The fruit of 2011 BOG VAR 3 was marked for the maximum fruit girth (12.20 cm) while fruit of 2011/BOG VAR 6 recorded the least girth (3.85 cm). The genotype 2011/BOG VAR 3 recorded highest fruit weight (1135 g) and the fruit weight was lowest in 2012/BOG VAR 1 (713 g). Number of fruits per plant was highest in NDBG 104 (14.83) and lowest in 2011/BOG VAR 7 (7.37). The results obtained are in accordance with those of Mahto *et al.* (2010) for fruit length and Sharma and Sengupta (2013) for fruit length, fruit girth and fruit weight.

Significantly higher fruit yield per hectare was recorded in 2011/BOG 6 (415.29 q/ha) followed by 2012/

Table 2 : Mean performance of various genotypes of bottle gourd for earliness, yield and its different components.

Characters	Node no at which 1st male flower appear	Node no at which 1st female flower appear	Days to 1st male flower appear (DAT)	Days to 1st female flower appear (DAT)	Days to 50% flowering (DAT)	Days to fruit set (DAT)	Days to 1st fruit harvest (DAT)	Fruit length (cm)	Fruit girth (cm)	Fruit weight (g)	No. of fruits per plant	No. of branches per plant	Fruit yield (q/ha)	Crop duration (sowing to last harvest)
2012 BOGVAR1	3.53	5.40	16.66	26.93	26.67	35.33	49.20	30.33	7.27	713.00	8.40	4.56	264.22	126.67
2012 BOGVAR2	3.46	7.66	27.33	34.00	35.33	42.26	47.47	26.67	10.29	926.67	10.33	4.70	327.33	124.00
2012 BOGVAR3	3.20	8.66	20.20	27.86	33.27	38.40	48.87	35.54	6.70	870.00	12.53	5.43	370.40	122.33
2012 BOGVAR4	2.50	6.44	16.26	25.66	25.40	34.00	42.87	29.33	7.62	971.67	12.33	5.13	398.53	125.33
2012 BOGVAR5	4.86	7.66	22.60	32.20	32.33	38.53	45.03	23.54	7.88	863.33	11.73	6.06	336.20	125.67
2012 BOGVAR6	4.66	9.23	20.80	29.73	32.00	41.40	48.17	19.63	10.05	1070.00	11.68	4.13	415.29	124.00
2012 BOGVAR7	5.46	8.23	22.53	32.66	33.20	38.26	50.43	35.36	6.94	921.67	10.47	4.00	323.18	118.67
2012 BOGVAR8	2.60	9.26	28.26	35.33	38.53	40.46	61.67	20.53	6.75	774.00	8.50	4.33	219.05	119.00
2011 BOGVAR1	3.13	6.13	21.10	29.33	28.13	33.20	42.73	31.00	7.07	930.00	9.27	3.90	289.29	112.67
2011 BOGVAR2	4.40	10.00	32.26	37.66	38.33	37.26	50.35	25.33	7.99	1014.00	9.10	3.53	316.33	118.00
2011 BOGVAR3	2.93	4.80	19.20	26.40	27.60	34.80	42.67	17.67	12.20	1135.00	8.60	3.66	395.33	100.33
2011 BOGVAR4	2.90	6.40	18.66	26.00	25.73	35.06	44.93	10.19	3.88	941.67	8.73	4.06	328.67	105.33
2011 BOGVAR5	3.66	7.13	22.33	30.33	29.47	34.13	46.33	27.90	7.54	805.00	7.87	4.02	213.00	103.67
2011 BOGVAR6	2.66	7.60	19.20	27.73	27.00	36.40	46.87	10.33	3.85	1053.33	8.64	4.03	302.33	107.67
2011 BOGVAR7	3.33	11.40	31.00	39.26	40.67	44.33	48.33	10.60	4.05	886.67	7.37	2.43	215.60	110.67
2010 BOGVAR1	2.66	7.40	22.66	32.00	33.33	35.53	43.40	23.00	7.29	660.00	9.93	6.13	217.38	112.33
2010 BOGVAR2	2.80	7.66	20.93	30.33	30.57	34.13	48.67	27.00	6.62	775.00	11.33	6.26	294.87	104.33
2010 BOGVAR3	2.86	7.33	23.33	31.33	33.00	31.93	41.33	27.23	7.47	828.33	12.67	5.33	349.00	112.33
2010 BOGVAR4	2.80	8.00	20.66	29.33	31.33	35.93	44.33	29.87	7.82	866.67	10.87	3.33	322.67	107.67
2010 BOGVAR5	2.81	8.60	22.00	31.60	32.13	34.02	44.47	26.47	7.97	810.00	11.67	4.06	313.33	110.00
NDBG104	4.40	8.86	22.66	32.46	33.87	34.66	47.33	34.33	7.17	838.33	14.83	3.93	376.27	122.00
Pusa Naveen	2.33	6.66	21.00	29.00	30.33	34.13	45.60	26.05	6.63	745.00	11.20	6.00	280.56	107.67
Mean (x)	3.36	7.75	22.35	30.78	31.73	36.56	46.86	24.90	7.32	881.78	10.36	4.58	312.22	114.56
SEm±	0.32	0.61	1.08	1.03	1.24	0.97	2.33	1.74	0.31	29.39	0.64	0.12	25.84	3.79
CD (p=0.05)	0.93	1.75	3.08	2.96	3.56	2.77	6.65	4.98	0.88	83.88	1.82	0.37	74.08	10.82
CV (%)	16.93	13.71	8.38	5.84	6.80	4.59	8.61	12.19	7.33	5.77	10.07	4.81	14.42	5.74

BOG VAR 4 (398.53 q/ha). Minimum crop duration (100.33 days) was recorded in 2011/BOG VAR 3 and the maximum crop duration (126.67 DAT) was observed in 2012/BOG VAR 1. Similar results obtained are in lines with those of Mahto *et al.* (2010), Husna *et al.* (2011), Yadav and Kumar (2012), Harika *et al.* (2012) and Sharma and Sengupta (2013) for fruit yield.

Performance studies revealed that the genotypes 2012 BOG VAR 6, 2012 BOG VAR 4, 2011 BOG VAR 3, 2010 BOG VAR 3 and NDBG 104 were found promising for earliness and fruit yield. In order to improve the fruit yield per plant and other important attributes genotypes falling in distant characters may be utilized in future breeding programme.

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