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## Evaluation of brinjal genotypes for plant growth and variability

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### Abstract

The present investigation entitled “Evaluation of Brinjal Genotypes from Eastern Vidarbha Zone” was conducted at the Experimental Unit, Botany Section, Shankar Nagar, College of Agriculture, Nagpur during *kharif* 2022-2023. The experimental design adopted was randomized block design with three replications comprising Twelve genotypes. Highest plant height was recorded in genotype NBG -7 (T<sub>7</sub>) (79.33 cm). Maximum plant spread (53.40 cm) and maximum leaf area (183.03 cm<sup>2</sup>) was recorded in genotype NBG-5. Highest number of primary branches (7.37) was recorded in genotype NBG-6 (T<sub>6</sub>). The genotype NBG-6 (T<sub>6</sub>) required minimum days to initiation of 1<sup>st</sup> flower bud (42.57 days), minimum days for Initiation flowering (45.33 days) and minimum days (47.83 days) for 50% flowering while, The highest number of flowers per cluster was obtained in genotype NBG-6 (T<sub>6</sub>) (5.07). Longest fruit (15.90 cm) was found in the genotype NBG-7 (T<sub>7</sub>), Genotype NBG-5 (T<sub>5</sub>) reported maximum fruit diameter (6.93 cm).

**Keywords:** Brinjal, *Solanum melongena*, genotypes

### Introduction

Brinjal (*Solanum melongena*) is one of the most important fruit vegetable in India. It is a species of the Solanaceae family, having chromosome number 2n=18. Vavilov (1928) has mentioned that its centre of origin was the Indo- Burma region. Brinjal is grown extensively in India, Bangladesh, Pakistan, China and other parts of the globe. Globally, it is grown in an area of about 1.87 million hectares with an annual production of 50.19 million tonnes and a productivity of 26.83 tonnes/ha. In India, the acreage of brinjal is 0.73 million hectares with an annual production of 12.80 million tonnes and a productivity of 18.06 tonnes/ha (Anonymous 2018) <sup>[1]</sup>. It contain β-carotene (34 mg), riboflavin (0.05 mg), niacine (0.5 mg) and ascorbic acid (0.9 mg) per 100 g of fruit (Kandoliya *et al.* 2015) <sup>[10]</sup>. India is the centre of variation for brinjal and is recommended even for patients with diabetes, asthma and bronchitis (Medina *et al.* 2014) <sup>[1]</sup>.

Fruit setting in brinjal cultivars with long-styled flowers varied from 70-86%. The fruit is pendant and is a fleshy berry borne singly or- in clusters. The large variability is seen in respect of fruit size, shape and growth habits, leaf size, leaf tip, cooking quality and tolerant to pest and disease.

### Materials and Methods

The experiment was carried out at the Experimental Unit, Botany Section, Shankar Nagar, College of Agriculture, Nagpur during *kharif* 2022-2023. 12 Genotypes (11 local genotypes + 1 standard check) The experiment was laid out in randomized block design with three replications at spacing of 60 cm × 60 cm. All the recommended cultural practices were followed to raised a healthy crop and data recorded for plant growth *viz.*, plant height(cm), plant spread (cm), leaf area (cm<sup>2</sup>), number of primary branches, days for initiation of flower bud, days for initiation of flowering, days for fifty percent flowering, no. of flower cluster, fruit length (cm), fruit diameter (cm). Least significance at 5% level was used for finding the significant differences among the treatment means. The data obtained from selected plants were subjected to analysis of variance as suggested by Panse and Sukhatme (1967) <sup>[17]</sup>.

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## Results and Discussion

Data on influence of different treatments on growth attributing characters of brinjal are presented in Table 1.

From the finding (Table 1), that significant differences were recorded in plant height by brinjal genotypes. NBG-7 with a plant height of 79.33 cm was recorded as the tallest followed by NBG-6 (77.16 cm) and NBG-9 (76.70 cm). Minimum plant height (65.74 cm) was noted in NBG-5. Thus a wide range of plant height (65.74 cm to 79.33 cm) was observed in the test cultivars. The tallness, shortness and other morphological differences are varietal and climacteric characteristics, which are controlled and expressed by certain genes and climatic factors. These findings are in agreement with that of Mahaveer *et al.* (2004) [14] in their study noticed the highest plant height in brinjal genotype BB-46 (117.67 cm) followed by Bilaspur-4 (116.67 cm) and Bilaspur-1 (109.67 cm) whereas the lowest plant height was noticed in Bilaspur-6 (72.67 cm). Rai *et al.* (1998) [19] also reported differences in plant height among varieties/hybrids of brinjal put under evaluation and screening.

Plant spread range of 42.93 cm to 53.40 cm was recorded in the 90 DAT among the cultivars. Highest plant spread (53.40 cm) was observed in NBG-5 followed by NBG-9 (53.07 cm), NBG-10 (50.43 cm) whereas the minimum plant spread was found in NBG-4 (42.93 cm). Plant spread was recorded by plants in east - west and north- south direction in randomly selected plants at different stages after transplanting and average was worked out in centimeter with summing up of observations.

The number of primary branches per plant ranged from 4.07 (NBG-1) to 7.37 (NBG-6) with overall mean of 5.45. The maximum number of primary branches per plant was observed in NBG-6 (7.37) followed by NBG-10 (6.40) while minimum number of primary branches was found in NBG-1 (4.07). These results are in close conformity with the findings of Khapte *et al.* (2012) [11] and Shinde *et al.* (2012) [23] who reported significant variation among the cultivars of brinjal for the number of branches per plant.

The leaf area ranged of (61.87 cm<sup>2</sup>) NBG-1 to (190.93 cm<sup>2</sup>) NBG-5 with a grand mean of 104.08 cm<sup>2</sup>. Leaf area was determined by using automatic leaf area metre. Significantly maximum leaf area was reported in genotypes NBG-5 (190.93 cm<sup>2</sup>) followed by NBG-3 (125.20 cm<sup>2</sup>) and NBG-11 (110.40 cm<sup>2</sup>) on the other hand minimum leaf area (61.87 cm<sup>2</sup>) was found in the genotype NBG-1 followed by the genotype NBG-4 (77.73 cm<sup>2</sup>) and NBG-2 (90.47 cm<sup>2</sup>). The Similar result reported by Rahul *et al.* (2017) [18] in brinjal.

Analysis of variance indicated that the effect of brinjal genotypes on days from transplanting to initiate flower bud varied significantly and was in the range of 43.33 to 51.40 days with grand mean of 45.73 days. The genotype NBG-6

(42.57 days.) was taken shortest time for 1st flower bud initiation which was at par with genotype NBG-10 (43.33 days), whereas, genotype NBG-7 (51.40 days) was taken longest duration for first flower bud initiation.

The variation in days to first flowering was recorded in ranged from 45.33 to 56.33 days with overall average for days to first flowering was 50.31 days presented in Table 1. The genotype NBG-6 (45.33 days) was taken shortest time for first flowering followed by genotype NBG-5 (45.00 days), While genotype NBG-7 (56.33 days) was taken longest duration for first flowering initiation. The result was in contradictory to the reports conducted by Shafeeq *et al.* (2007) [21], Mishra *et al.* (2008) [16].

Days to 50% flowering was recorded from the date of transplanting and it ranged from NBG-6 (47.83 days) to NBG-7 (61.43 days) with overall average for days to 50 percent flowering was 55.33 days. The minimum number of days to 50% flowering was found in NBG-6 (47.83 days) followed by NBG-1 (50.40 days) and NBG-12 (52.57 days) (46.66 days) and the maximum number of days to 50% flowering was found in NBG-7 (61.43 days). The similar findings were confirmed with Balaji *et al.* (2013) [5] studied sixty brinjal genotypes and recorded that the germplasm line IC-90930 took minimum days (33.00) to 50% flowering.

During the course of investigation, different genotypes had shown significant differences in various growth. Among the genotypes NBG-7 (15.90 cm) recorded significantly higher fruit length followed by NBG-9 (13.07 cm). The minimum fruit length was found in NBG-4 (5.67 cm). Similar conclusions also recorded by Magar (2014) [13] studied F1 generation of brinjal and observed that length of fruit in the range of 6.23 cm to 16.3 cm with mean of 11.09 cm.

The data obtained for the diameter of fruit of twelve genotypes of brinjal is shown in Table 1. There is significant variation in the diameter of fruits of twelve brinjal genotypes. It is in the range of 4.23 to 6.93 cm with a general mean of 5.27 cm. Genotype NBG-5 (T<sub>5</sub>) reported maximum fruit diameter (6.93 cm). Minimum fruit diameter was reported from genotype NBG-3 (T<sub>3</sub>) (4.23 cm). The result was in contradictory to the reports conducted by Darekar *et al.* (1991) [6], in brinjal.

All the twelve brinjal genotypes recorded notable variations as far as fruit shape is concerned. The data presented in Table 1 revealed that brinjal genotype under study exhibited wide variation in shape of the fruit and were categorized as round, slender, Oval, oblong and long etc. The fruits of treatment T<sub>7</sub> (NBG-7) had long fruits. The round shape fruits were observed in the treatments T<sub>4</sub> (NBG-4) and T<sub>10</sub> (NBG-10). Further, the treatment treatments T<sub>6</sub> (NBG-6) and T<sub>9</sub> (NBG-9) had the oblong shaped fruits. While others seven genotypes had oval shape fruit.

**Table 1:** Mean performance of brinjal genotypes

Tr. No.	Genotypes	Plant height (cm)	Plant spread (cm)	Leaf area (cm)	No. of primary branches	Days to Initiation of flower bud	Days to initiation 1st flowering	Days to 50% flowering	Fruit Length (cm)	Fruit shape	Fruit Diameter (cm)
T <sub>1</sub>	NBG-1	74.25	47.80	61.87	4.07	43.37	47.33	50.40	7.30	Oval	5.60
T <sub>2</sub>	NBG -2	73.90	45.03	90.47	6.13	44.50	49.00	55.17	7.60	Oval	4.50
T <sub>3</sub>	NBG -3	76.26	49.63	125.20	4.93	47.43	52.67	57.17	7.23	Oval	4.23
T <sub>4</sub>	NBG -4	70.33	42.93	77.73	4.57	50.17	56.00	59.57	5.67	Round	4.50
T <sub>5</sub>	NBG -5	65.74	53.40	190.93	5.33	43.40	47.00	55.13	11.47	Oval	6.93
T <sub>6</sub>	NBG -6	77.16	47.27	104.60	7.37	42.57	45.33	47.83	10.57	Oblong	6.07
T <sub>7</sub>	NBG -7	79.33	49.57	98.80	6.33	51.40	56.33	61.43	15.90	Long	5.10
T <sub>8</sub>	NBG -8	73.67	43.80	99.70	5.33	43.70	48.33	55.07	9.33	Oval	5.33
T <sub>9</sub>	NBG -9	76.70	53.07	96.60	5.30	46.27	51.00	59.43	13.17	Oblong	5.83
T <sub>10</sub>	NBG -10	69.17	50.43	92.10	6.40	43.33	49.67	55.53	5.77	Round	6.27
T <sub>11</sub>	NBG -11	76.33	44.00	110.40	4.17	47.20	52.33	56.63	7.73	Oval	4.50
T <sub>12</sub>	AKLB -9 (Check)	75.67	48.00	100.53	5.43	45.43	48.67	52.57	8.23	Oval	4.37
S.E. ± m.		2.42	2.28	2.64	0.22	1.08	1.46	2.04	0.25	-	0.15
CD @ 5%		7.1	6.54	7.59	0.63	3.09	4.18	5.86	0.73	-	0.44

### Conclusion

It can be concluded from the present investigation that the genotype NBG-7 reported highest plant height and genotype NBG-6 reported earliest days to flower bud initiation, 1<sup>st</sup> flowering and 50% flowering. Genotype NBG-5 recorded maximum plant spread and leaf area under Eastern Vidarbha conditions of Maharashtra.

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