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## Evaluation of different genotypes of brinjal (*Solanum melongena* L.) for growth, flowering and yield attributes

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### Abstract

A comparative study on 08 brinjal genotypes for growth, flowering and yield attributing parameters was conducted at Horticulture research farm, Pili Kothi, Department of Horticulture, Tilak Dhari Post Graduate College, Jaunpur, Uttar Pradesh during *Kharif season* 2019. Pant Rituraj (T<sub>5</sub>) was found to be statistically superior in plant height (62.63 cm) over the other genotypes whereas, maximum number of primary branches was found in T<sub>4</sub> (Pant Samrat) 4.74. Days to first flowering (42.13), days to first picking (65.09), days to second picking (75.04) and number of days to first fruit set (50.08) were found superior in T<sub>5</sub> (Pant Rituraj). The maximum number of flowers per inflorescence and number of fruits per cluster were observed in T<sub>2</sub> (White Round) with 5.18 flowers per inflorescence and 5.23 numbers of fruits per cluster. Maximum fruit diameter (6.05 cm) was found in T<sub>1</sub> (Green Round). Pant Samrat (T<sub>4</sub>) was found to be statistically superior in number of marketable fruits per plant (8.63), fruit length (16.56 cm), fruit weight (602.33 g) and total yield (904 q/ha) over the other genotypes.

**Keywords:** Brinjal, primary branches, fruits per cluster, flowers per inflorescence and marketable fruits per plant

### Introduction

Brinjal (*Solanum melongena* L. 2n=24) is an important and staple vegetable crop in Central-South and South Eastern Asia and some countries of Africa. In India, brinjal is grown in all parts except at high altitudes. It is more common for its reasonable yield, wide adaptability and its preference by the consumers. According to De Candole, brinjal has been known in India since ancient times. It is the native of India and China is believed to be the secondary centre of origin. Brinjal has been an ideal experimental material for genetic studies due to easy artificial hybridization. Ease in crossing has resulted in increasing emphasis on exploitation of heterosis on commercial scale in this crop.

On the world basis brinjal occupies an area of 0.43 m ha with a total production of 5.64 m tonnes. In India, brinjal occupies an area of 0.29 m ha with an annual production of 3.1 m tonnes and has a low productivity of 10.46 tonnes per ha as compared to the productivity of 28.88 tonnes per ha in the developed countries (Gill and Tomar, 1991) <sup>[3]</sup>.

Brinjal has been a staple vegetable in our diet and contains 1.4 g protein, 0.3 g fat, 0.3 g minerals, 1.3 g fiber, 92.7 g moisture per 100 g edible fruit and it is also a good source of calcium (18 mg), magnesium (16 mg) and phosphorus (47 mg). There are multifarious uses of brinjal. It is used as vegetable cooked, fried or roasted and in other culinary preparations. The brinjal fruit has cardiogenic, laxative and analgesic properties and enriches the blood. It is said to be good for diabetic patients.

Brinjal occupies an important place under All India Coordinated Vegetable Improvement Project and research work in this crop is going on at many main centre and sub centre in the country. The main brinjal breeding objectives under this project are evolution of high yielding, good quality, disease resistant (little leaf, phomopsis blight) insect resistant (Epilachna beetle, fruit and shoot borer, aphids, mites) cultivars suitable for ratooning for spring harvest.

In view of increasing population, there is a need for increased production and productivity levels of brinjal. Further there is high local preferences for colour, shape, taste, there are specific genotypes suited for specific locality. It is not possible to have one common cultivar which may be suitable for different areas and local preferences. It is therefore required to improve the locally preferred cultivars for high yield and adaptation or development of new hybrid combinations.

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Hybrid varieties have many advantages over the local varieties. Scientific and accurate breeding programs have made it possible not only to bring out the outstanding qualities of the parent plants, but in most cases these qualities have been enhanced and new desirable characteristics added to the resultant hybrid plants. In addition to qualities like good vigor, trueness to type, heavy yields and high uniformity which hybrid plants enjoy, other characteristics such as earliness, disease resistance and good holding ability have been incorporated into most F1 hybrids. Uniform plant habit and maturity, coupled with uniformity in shape or size have made hybrid vegetables extremely suitable for commercial cultivation. Today we have many hybrid varieties available in the market, and it necessitates their evaluation to find out the best suited varieties for a particular place that fulfill the requirement of farmers and consumers of specific choice. Looking at above facts, an experiment was designed to evaluate the hybrids for growth, flowering and yield parameters.

### Materials and methods

The present experiment was conducted during the *Kharif* season of 2019 at Horticulture research farm, Pili Kothi, Department of Horticulture, Tilak Dhari Post Graduate College, Jaunpur, Uttar Pradesh. Jaunpur is situated at the 25°44'0" N latitude and 82°41'0"E longitude at an altitude of 83.230 meters above mean sea level. Jaunpur, the place of investigation, is sub-tropical with three distinct seasons *i.e.*, winter, summer and rainy. During the winter season (December-January) temperature fall, 5 °C or even low, while in summer season (May-June) it reaches as high as 45 °C. Occasional spell of frost and precipitation may occur during winter. Most of the rainfall is received in the middle of July to end of September after which the intensity of rainfall decreases. The mean annual rainfall is about 850-1100 mm.

The experiment was laid out in a randomized block design (RBD) with three replications comprising 08 genotypes *ie.* Green Round, White Round, DBL-24, Pant Samrat, Pant Rituraj Kashi Komal, Kashi Sandesh and Aruna. Individual plots were observed for normal plants representing each genotype the following observations were recorded during the crop growth period on ten randomly selected competitive plants, which were tagged in each plot of every replication. Observations were recorded on plant height (cm), number of primary branches per plant, days to first flowering, flower per inflorescence, number of days to first fruit set, number of fruits per cluster, number of marketable fruit per plant, days to first picking, days to second picking, fruit length (cm), fruit diameter (cm), fruit weight (g) and total yield (q/ha). The data was analyzed by adopting the standard procedure of Panse and Sukhatme (1985) [7] and using OPSTAT software. Wherever, the results were found significant, critical differences (CD) were computed at 5 percent level of probability to draw statistical conclusions.

### Result and discussion

The results of the investigation for growth, flowering and yield parameters are presented under following headings and depicted in Table 1 and Table 2.

#### Growth and flowering parameters

##### Plant height (cm)

Plant height showed significant differences among all the genotypes. It ranged from 52.62-62.63 cm. Maximum Plant

height was observed in Pant Rituraj (62.63 cm) whereas; minimum plant height was recorded in Kashi Sandesh (52.62 cm). Above findings regarding to variation in first flowering in different brinjal genotypes are in conformity with Dixit *et al.* (1982) [2], Singh and Kumar (1988) [9] and Sawant *et al.* (1992) [8].

##### Number of primary branches

Number of primary branches showed significant differences among all the genotypes. It ranged from 2.82-4.74. Maximum primary branch was observed in Pant Samrat (4.74) whereas; minimum plant height was recorded in Kashi Komal (2.82).

##### Days to first flowering and fruit set

Significant differences were observed among all the genotypes for days to first flowering and days to first fruit set. Mean performance of genotypes for days to first flowering and days to first fruit set ranged from 42.13 days to 54.92 days and from 50.08 days to 63.91 respectively. The earliest flowering and fruit set were recorded in Pant Rituraj (42.13 days and 50.08 days) followed by Pant Samrat (43.68 days and 51.05 days) and Aruna (45.25 days and 53.26 days) respectively. Above findings regarding to variation in first flowering in different brinjal genotypes are in conformity with, Ashwani and Khandelwal (2003) [1] and Mahaveer *et al.* (2004) [5].

##### Number of flower per inflorescence

Significant differences were observed among all the genotypes for number of flower per inflorescence. Mean performance of genotypes for Number of flower per inflorescence ranged from 02.85 to 5.18. The maximum flowers per inflorescence were recorded in White Round (5.18 days).

##### Yield parameters

##### Number of fruits per cluster

Significant differences were observed among all the genotypes for number of fruit per cluster. Mean performance of genotypes for number of fruit per cluster ranged from 01.08 to 5.23. The maximum fruits per cluster set were recorded in White Round (5.23 days).

##### Number of marketable fruit per plant

Significant differences were observed among all the genotypes for number of marketable fruit per plant. It ranged from 2.19 to 8.63 kg/plant. Maximum number of marketable fruit per plant was recorded in Pant Samrat (8.63 kg/ha) whereas minimum number of marketable fruit per plant was observed in Kashi Sandesh (2.19 kg/plant).

##### Days to first and second picking

Significant differences were observed among all the genotypes for days to first and second picking. Mean performance of genotypes for days to first and second picking ranged from 65.09 days to 79.20 days and from 75.04 days to 89.23 respectively. The minimum days to first and second picking were recorded in Pant Rituraj (65.09 days and 75.04 days) followed by Pant Samrat (66.33 days and 76.33 days) respectively. Above findings regarding to variation in first flowering in different brinjal genotypes are in conformity with, Ashwani and Khandelwal (2003) [1] and Mahaveer *et al.* (2004) [5].

**Table 1:** Evaluation of different genotypes of Brinjal for growth and flowering attributes

Treatments	Plant height (cm)	Number of primary branches per plant	Days to first flowering	Number of flower per inflorescence	Number of days to first fruit set	Number of fruits per cluster	Number of marketable fruits per plant
Green Round	54.73	4.28	48.17	2.85	56.03	1.20	3.11
White Round	57.87	4.15	51.91	5.18	59.40	5.23	7.08
DBL-24	57.24	3.21	54.34	4.50	61.47	3.25	4.86
Pant Samrat	56.24	4.74	43.68	4.91	51.05	3.35	8.63
Pant Rituraj	62.63	3.89	42.13	4.23	50.08	1.08	2.53
Kashi Komal	53.13	2.82	54.25	3.23	63.17	1.13	2.23
Kashi Sandesh	52.62	3.25	54.92	3.00	63.91	1.15	2.19
Aruna	60.26	3.90	45.25	4.00	53.26	3.00	3.58
CD at 5%	0.177	0.252	1.086	0.799	1.116	0.384	0.247
SEM±	0.058	0.082	0.355	0.261	0.364	0.125	0.081

**Table 2:** Evaluation of different genotypes of Brinjal for yield attributes

Treatments	Days to first picking	Days to second picking	Fruit length (cm)	Fruit diameter (cm)	Fruit weight (g)	Total yield (q/ha)
Green Round	71.26	80.93	10.20	6.05	404.33	667.00
White Round	74.62	84.52	7.50	4.89	321.33	632.00
DBL-24	77.18	87.48	10.08	5.14	388.66	604.00
Pant Samrat	66.33	76.33	16.56	3.12	602.33	904.00
Pant Rituraj	65.09	75.04	7.15	6.20	345.00	704.00
Kashi Koaml	77.73	88.10	6.36	3.46	240.66	628.66
Kashi Sandesh	79.20	89.23	12.02	5.46	237.33	608.00
Aruna	68.24	82.13	6.15	4.35	230.33	562.00
CD at 5%	0.943	0.415	0.933	0.376	18.507	2.725
SEM±	0.308	0.136	0.305	0.120	6.043	0.890

**Fruit length (cm)**

The genotype Pant Samrat recorded significantly the highest fruit length (16.56 cm), while the lowest in the genotype Aruna (6.15 cm). Thus range of fruit length was in between 6.15 cm to 16.56 cm. The variation in above characters was also reported by Mahaveer *et al.* (2004)<sup>[5]</sup>, Thapa *et al.* (2005)<sup>[10]</sup>, Maharana *et al.* (2006)<sup>[4]</sup>, Mishra *et al.* (2008)<sup>[6]</sup> in brinjal genotypes.

**Fruit diameter (cm)**

Fruit diameter showed significant differences among all the genotypes. It ranged from 3.12-6.20 cm. Maximum fruit diameter was observed in Pant Rituraj (6.20 cm). Minimum fruit diameter was recorded in Pant Samrat (3.12 cm).

**Fruit weight (g)**

Significant differences were observed among all the genotypes for average fruit weight. It ranged from 230.33 to 602.33 g. Maximum average fruit weight was recorded in Pant Samrat (602.33 g) whereas minimum fruit weight was observed in Aruna (230.33 g). The variation in weight of the fruit was also recorded by the Mahaveer *et al.* (2004)<sup>[5]</sup>, Thapa *et al.* (2005)<sup>[10]</sup>, Mishra *et al.* (2008)<sup>[6]</sup>.

**Total yield (q/ha)**

Significant differences were observed among all the genotypes for total yield. It ranged from 562 to 904 q/ha. Maximum total yield was recorded in Pant Samrat (904.00 q/ha) whereas minimum fruit weight was observed in Aruna (562 q/ha). The variation in weight of the fruit was also recorded by the Mahaveer *et al.* (2004)<sup>[5]</sup>, Thapa *et al.* (2005)<sup>[10]</sup>, Mishra *et al.* (2008)<sup>[6]</sup>.

**Conclusion**

Thus, from the results obtained and analyzed during the

present investigation, it was concluded that all these eight genotypes of brinjal differed significantly for most of the growth, flowering and yield parameters under study. The genotype Pant Rituraj was found to be the earliest in initiation of days to first flowering; maximum fruit length and total yield were found in Pant Samrat.

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