



# VARIETAL PERFORMANCE OF BRINJAL (*SOLANUM MELONGENA*L.) UNDER DIFFERENT GROWING CONDITIONS

L. Singh, T. Chamroy\* and A. Rajkumari

Department of Horticulture, Lovely Professional University, Phagwara, Punjab.

## Abstract

The present study entitled “Varietal performance of brinjal (*Solanum melongena* L.) under different growing conditions” was carried out at research farm of Lovely Professional University, Punjab, during winter season of 2017. Eight brinjal varieties viz., White round, White long, Chu-Chu, Purple round, Shyamal, Sharapova, Him mani- 412 and Nisha were grown under two different growing conditions viz., poly-tunnel and open field. Growing conditions and varieties had significant influence on growth, yield parameters and yield. The poly tunnel grown brinjal recorded maximum plant height and number of leaves at 30, 45 and 60 days and number of branches at 45 and 60 days and most of the yield parameters and yield than the open field. It was observed that, plant height (30, 45 and 60 days after transplanting) was highest in Sharapova variety, followed by Shyamal, while the highest number of leaves (30, 45 and 60 days after transplanting) and number of branches (45 and 60 days after transplanting) were recorded in Shyamal variety, followed by Purple round. The variety Shyamal performed best with respect to yield and most of the yield parameters followed by Sharapova. While, the number of fruits per plant was highest in White long followed by Shyamal.

**Key words :** Varieties, poly-tunnel, open field, growth and yield.

## Introduction

Eggplant (*Solanum melongena* L.) is an important solanaceous warm season crop mainly grown in tropical and subtropical parts of Asia and Africa. In India it is cultivated at an area of 669 thousand hectare with an annual production of 12400 thousand MT. In Punjab, it is grown at an area of 4.26 thousand hectare with the production of 92.39 thousand metric tonnes annually (Anon. 2017). Nowadays, brinjal is grown both under open field conditions and protected structures whereby maintaining the required temperature. The low temperatures exhibit undesirable effect on plant growth, pollen viability, pollen quantity, fertility and fruit setting on eggplant especially in winter seasons (Acciarri *et al.*, 2002).

Among all the crops, there is highest area under varieties of brinjal grown in India (14%). The hybrids of the various crops that we use mostly in recent time gave significant yield when compared to high yielding varieties. Improved varieties recommended for particular area plays an important role in getting higher returns. Therefore

keeping in view the importance of suitable growing conditions and varieties in achieving higher yield of good quality fruits, the present investigation was carried out in the research farm of LPU, Phagwara, Punjab.

## Methods and Material

The experiment was conducted during 2017-2018 at research farm of Lovely Professional University, Phagwara, Kapurthala District, Punjab (India). Eight brinjal varieties viz., White round, White long, Chu- Chu, Purple round, Shyamal, Sharapova, Him mani- 412 and Nisha were evaluated under two growing conditions viz., poly tunnel and open field. The experiment was laid out in Factorial Randomized Block Design (FRBD) with 3 replications. Seedlings were raised under poly-house condition and were transplanted at the age of 30 days at 45 cm × 45 cm spacing during September. Before transplanting, vermicompost @16 t/ha was incorporated in the soil at the time of field preparation and NPK@180:80:80 kg/ha was applied during the entire season. Full dose of P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O were applied in the soil before transplanting. Thereafter, Nitrogen was applied in two equal splits at 15 and 45 days after transplanting.

\*Author for correspondence : E-mail : tchamroy@gmail.com

The observations were recorded from randomly selected five tagged plants of each plot/replication. Data on growth parameters viz., plant height (cm), number of branches and number of leaves and yield parameters viz., number of fruits/plant, fruit weight (g), fruit yield (g/plant) and fruit yield (q/ha) were recorded and subjected to statistical analysis.

## Results and Discussion

### Growth parameters

Growth parameters exhibit the vigour of the plant. Data presented in table 1 confirms that different growing conditions and varieties had significantly influenced growth parameters of brinjal. The poly tunnel grown brinjal recorded maximum plant height at 30, 45 and 60 DAT (32.67, 50.21 and 70.03 cm), number of branches/plant at 30, 45 and 60 DAT (13.95, 30.74 and 52.79) and number of leaves/plant at 30, 45 and 60 DAT (13.88, 30.67 and 49.80). The highest plant growth inside poly tunnel in comparison to open field condition might be associated with controlled atmosphere inside poly tunnel and also due to the fact that in poly house there is availability of more favourable climate which leads to the development of more internodal length, more photosynthetic activity and respiration. Similar observations on influence of different growing conditions on different growth

parameters were reported by various researchers like Kanwar (2011) and Kumar *et al.*, (2016) for plant height, Nguillie and Biswas (2016) for number of branches and (Rajasekar *et al.*, 2013) for number of leaves/plant.

Among all the varieties, Sharapova ( $V_6$ ) exhibited maximum plant height at 30, 45 and 60 DAT (37.92, 59.16 and 76.46 cm). While, the variety Shyamal ( $V_3$ ) is superior in terms of number of branches/plant at 45 and 60 DAT (7.62 and 11.02) and number of leaves at 30, 45 and 60 DAT (18.73, 37.14 and 57.26). The maximum plant growth might be associated with particular characteristics of the variety. Similar observations on influence of different varieties on different growth parameters were reported by various researchers like Tripathy *et al.* (2017) for plant height, Rahul *et al.*, (2017) and Tripathy *et al.*, (2017) for number of branches/plant and Rahul *et al.*, (2017) for number of leaves/plant.

### Yield parameter and yield

Different growing conditions and varieties had significantly influenced Yield parameters and yield Table 2. The poly tunnel grown brinjal recorded maximum number of fruits/plant (32.25), fruit weight (32.21 g), fruit yield/plant (1035.83 g), and fruit Yield/ha (506.40 q). The higher yield grown under poly tunnel might be attributed to the prevailing favourable climatic conditions, leading

to higher vegetative growth, contributing to more number of leaves, maximum fruit diameter, maximum fruit weight and fruit volume. Similar observations on influence of different growing conditions on different yield parameters and yield were reported by various researchers like Kanwar (2011) and Kumar *et al.*, (2016) and Nguillie and Biswas (2016) for number of fruits/plant, Kumar *et al.*, (2016) and Cheema (2013) for fruit weight, Kanwar (2011) and Kumar *et al.*, (2016) for fruit yield/plant and Kanwar (2011) and Kumar *et al.*, (2016) for fruit yield/ha.

The variety White long ( $V_2$ ) recorded maximum number of fruits/plant (37.75). However, most of the yield and yield parameters such as, fruit weight (40.79 g), fruit yield/plant (1292.05 g), and fruit Yield/ha (631.67 q)

**Table 1:** Influence of different growing conditions and varieties of brinjal on growth parameters.

Growing condition (E)	Plant Height (cm)			Number of branches/ plant		Number of leaves/plant		
	30 DAT	45 DAT	60 DAT	45 DAT	60 DAT	30 DAT	45 DAT	60 DAT
E <sub>1</sub>	32.67	50.21	70.03	6.35	9.86	13.88	30.67	49.80
E <sub>2</sub>	30.57	47.18	65.58	5.68	8.68	13.14	29.84	48.81
F test	S	S	S	S	S	S	S	S
CD at 5 %	1.02	1.09	1.03	0.10	0.10	0.22	0.17	0.36
SE(m)±	0.35	0.37	0.36	0.04	0.03	0.08	0.06	0.13
Varieties (V)								
V <sub>1</sub>	26.10	39.90	61.76	4.60	7.53	8.59	24.64	41.36
V <sub>2</sub>	27.86	41.67	62.57	6.10	9.48	14.23	30.62	50.02
V <sub>3</sub>	29.97	46.27	62.34	6.40	9.82	15.83	32.28	52.83
V <sub>4</sub>	31.89	49.93	69.16	7.00	10.18	17.26	34.88	55.00
V <sub>5</sub>	35.86	55.56	74.20	7.62	11.02	18.73	37.14	57.26
V <sub>6</sub>	37.92	59.16	76.46	5.13	8.08	9.79	26.03	44.27
V <sub>7</sub>	34.15	52.04	72.33	5.48	8.82	11.09	27.43	45.78
V <sub>8</sub>	29.08	45.02	63.66	5.78	9.20	12.58	29.02	47.94
F test	S	S	S	S	S	S	S	S
CD at 5 %	2.04	2.17	2.06	0.21	0.20	0.45	0.34	0.73
SE(m)±	0.70	0.75	0.71	0.07	0.07	0.16	0.12	0.25

\*DAT- Days after transplanting.

**Table 2:** Influence of different growing conditions and varieties of brinjal on yield parameters and yield.

Growing condition (E)	Number of fruits/ plant	Fruit weight (g)	Fruit yield/ plant (g)	Fruit yield/ ha (q)
E <sub>1</sub>	32.25	32.21	1035.83	506.40
E <sub>2</sub>	22.54	26.66	591.10	288.98
F test	S	S	S	S
CD at 5 %	1.00	0.51	34.28	16.76
SE(m)±	0.35	0.18	11.81	5.77
Varieties (V)				
V <sub>1</sub>	29.08	28.15	832.88	407.18
V <sub>2</sub>	37.75	20.06	771.05	376.96
V <sub>3</sub>	19.33	26.11	509.99	249.33
V <sub>4</sub>	23.50	30.20	720.61	352.30
V <sub>5</sub>	31.25	40.79	1292.05	631.67
V <sub>6</sub>	24.08	36.20	881.97	431.09
V <sub>7</sub>	26.67	29.92	818.97	400.39
V <sub>8</sub>	27.50	24.06	680.38	332.63
F test	S	S	S	S
CD at 5 %	2.00	1.02	68.55	33.51
SE(m)±	0.691	0.35	23.62	11.55

were found maximum in the variety Shyamal (V<sub>5</sub>). The highest yield in Shyamal (V<sub>5</sub>) might be associated with its genetical makeup, essential character of the variety and due to higher value of some yield attributing characters. Similar observations were reported by researchers like Cheema *et al.*, (2013) and Kumar *et al.*, (2016) for number of fruits/plant, Rahul *et al.* (2017) and Tripathy *et al.*, (2017) for fruit weight, Kanwar *et al.*, (2011), Cheema *et al.*, (2013), Chaturvedi *et al.*, (2016) and Rahul *et al.*, (2017) for fruit yield/plant and Chaturvedi *et al.*, (2016) for fruit yield/ha.

### Conclusion

Based on the experimental results, it can be concluded that poly tunnel showed superior effect on growth, yield parameters and yield of brinjal. Therefore, if brinjal is planted under poly tunnel, it will establish good stands that mature earlier and maximum yield will be realized. The variety Shyamalis the best in terms growth, yield attributes and yield of brinjal under Punjab condition. However, since these findings are based on one year experiment, these varieties may be further evaluated for commercial exploitation under poly tunnel and open field cultivation to substantiate the results.

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