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Research Article

Evaluation of brinjal (*Solanum melongena* L.) hybrids for growth and yield characters under rainfed mid hill condition of Uttarakhand

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ABSTRACT : Eight brinjal hybrids/varieties namely PPL-74, Chaya, Surya kiran, Nishant, Pant Samrat, PB-5, PB-67 and Pant Rituraj were evaluated in Research Farm of Department of Vegetable science, College of Forestry and Hiil Agriculture Ranichauri, Distt Tehri Garhwal, Uttarakhand. The experiment was conducted during summer-rainy season and data were averaged of two consecutive years, respectively 2011-2012 and 2012-2013. The experiment was arranged in Randomized Complete Block Design with 3 replications. PPL-74 took the shortest period of days to flowering and first harvest with an average of 45 to 55 days after transplanting, respectively. The mean of two successive year PPL-74 was found superior over rest of other hybrids with respect to most of desirable characters fruit length (22.05 cm), fruit stalk length (6.98 cm), plant spread (126.16 cm), marketable fruit yield (712.96 t/ha), while minimum values for most of the parameters were observed in PB-67 and Chaya proved the 2nd best hybrids in respect to the most of characters.

KEY WORDS : Brinjal, Rainfed mid hill condition, Varieties/hybrids

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INTRODUCTION

Brinjal (*Solanum melongena* L.) is one of the most important fruit vegetable belonged to the family Solanaceae. Vavilov (1928) has mentioned that its centre of origin was the Indo-Burma region. It has been a stable vegetable in our diet since ancient times. Both poor and rich like it, contrary to the common belief, it is quite high in nutritive value and can well be compared with tomato (Chaudhary, 1976). The unripe brinjal fruit is primarily used as cooked vegetable for preparation of various dishes in different region of the world. It has got much potential as raw material in pickle making and dehydration industries (Singh, 1963)

Among the solanaceous vegetables, brinjal is the most common, popular and principal vegetable crop grown in many geographical parts in India. The area under brinjal cultivation is estimated at 680.00 ha. with total production of 11896.00 Mt and productivity 17.5 mt/ha (NHB data, 2011). Brinjal is mainly cultivated on small family farms and it is a source of cash income for resource poor farmers. Keeping in view the above facts and considering the potential of brinjal as off season crop in hilly area, this investigation has been carried out to increase the production productivity of brinjal crop by using suitable hybrids at proper sowing time.

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EXPERIMENTAL METHODS

Investigation was conducted during *Kharif* season of 2011-2012 and 2012-2013 at Vegetable Research Block of College of Forestry and Hill Agriculture, Ranichauri (2000 m altitude, $30^0$15'N latitude and $78^0$50' E longitude), Tehri Garhwal, Uttarakhand. Eight varieties/ hybrids *viz*., PPL-74, Chaya, Surya kiran, Nishant, Pant Samrat, PB-5, PB-67and Pant Rituraj were evaluated under mid hill conditions of Ranichauri. The experiment was laid out in Randomized Block Design of plots 3.5×2.5 m size. The crop was raised by applying NPK @ 100:80:60 kg/ha and seedlings were transplanted at 60×60 cm spacing. Data were recorded on plant height at harvesting (cm), per fruit wt. (kg), fruit length (cm), fruit diameter (mm), fruit stalk length (cm), no. of primary branches, diameter of root at colour portion (mm), plant spread (cm) and marketable yield (qha^{-1}).

EXPERIMENTAL RESULTS AND ANALYSIS

Results obtained from the study have been averaged in Table 1 and discussed in this paper.

Plant height :

It is evident from Table 1 that significant differences were recorded in plant height by brinjal hybrids/cultivars. Chaya with a plant height of 1.201 m was recorded as the tallest followed by PPL-74 (1.023 m) and Pant Samrat (1.011 m). Minimum plant height (0.845 m) was noted in PB-5. Thus a wide range of plant height (1.201-0.845 m) 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 Mohanty *et al*. (2001) who reported that assessment of brinjal cultivars in black soil of Orissa, the greatest plant height was recorded in BB-11 fallowed by Bhawanipatna Local and Black Beauty. Rai *et al.* (1998) also reported differences in plant height among varieties/hybrids of brinjal put under evaluation and screening trials.

Number of primary branches per plant :

Cultivar PPL-74 produced higher number of primary braches per plant (8.00) over other cultivars. Cultivars Pant Samrat, Nishant and Chaya with 7.66, 7.50, and 7.33 branches per plant followed it, respectively. The lowest number of primary branches per plant was recorded by Surya Kiran (6.00). The data showed an increasing tendency in the number of primary branches per plant with an increase in the plant height. These results are in close conformity with the findings of Deotale *et al.* (1998) and Rai *et al.* (1998) who reported significant variation among the cultivars of brinjal for the number of branches per plant.

Diameter of root at color portion (mm):

The data presented in Table1 regarding diameter of root at color portion indicate significant differences among eight brinjal cultivars. It was found that hybrid Surya Kiran gave the maximum diameter of root (29.81 mm) followed by variety Pant Rituraj (23.03 mm) and Pant Samrat (22.31 mm), while hybrid Chaya (20.58 mm) recorded minimum diameter of root at color portion. The diameter of root is attributed as genotypic character and somewhat influenced by the environmental factors of any particular growing area. Similar kind of experiment was done by Srivastava *et al*.(1997) and Mohanty *et al.* (2001), who reported the performance of the

Table 1 : Two year (2011-12 and 2012-13) average data of brinjal evaluated under mid hill condition of Uttarakahnd

Variety	Plant height (m)	No. of primary branches	Diameter of root at color portion (mm)	Plant spread (cm)	Fruit length (cm)	Fruit Dia. (mm)	Fruit stalk length (cm)	Marketable yield (q/ha)
PPL-74	1.02	8.00	22.300	126.16	22.05	28.70	6.98	712.96
Chaya	1.20	7.33	20.583	120.66	16.61	30.01	6.66	498.98
Surya kiran	1.00	6.00	29.816	112.16	8.50	67.96	6.33	245.83
Nishant	0.88	7.50	21.216	095.66	11.90	42.18	5.18	549.90
Pant Samrat	1.01	7.66	22.316	107.50	15.10	33.16	5.98	289.16
PB-5	0.84	7.16	20.750	113.66	16.60	29.95	6.21	259.26
PB-67	0.87	6.66	22.133	118.66	16.41	38.43	5.78	334.35
Pant Rituraj	0.86	6.00	23.033	102.33	8.000	46.01	6.43	345.64
'F' Test	**	NS	**	*	**	*	*	**
S. E. ±	0.429	0.726	1.371	6.072	0.989	7.440	0.301	70.917
C. D. (P=0.05)	0.130	2.202	4.161	18.417	3.001	22.565	0.914	215.084
C. V. (%)	7.717	17.861	10.436	8.981	11.903	31.679	8.427	30.365

NS=Non-significant

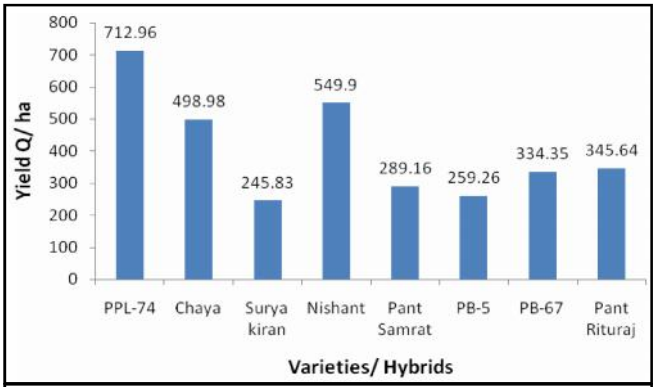

Fig. 1 : Marketable yield of different hybrids/hybrids

brinjal cultivars in different situation.

Plant spread (cm) :

A plant spread range of 126.16 to 095.66 cm was recorded in the harvesting period among the cultivars. Highest plant spread (126.16 cm) was observed in PPL-74 followed by Chaya (120.66 cm), PB-67 (118.66 cm) and PB-5 (113.66 cm), whereas the minimum plant spread was found in Nishant (095.66 cm). Plant spread was recorded by plants in east-west and north- south direction in randomly selected plants at harvesting stage and average was worked out in centimeter with summing up of observations.

Fruit length (cm) :

During the course of investigation, different hybrids/ varieties had shown significant differences in various growth and yield parameters. Among the hybrid/ varieties PPL-74 recorded significantly higher fruit length (22.05 cm) fallowed by Chaya (16.61 cm) and PB-5 (16.60). The minimum fruit length (8.00 cm) was found in variety Pant Rituraj. Such findings of present investigation pertinent to the evaluation of brinjal cultivars were reported by Jaiswal *et al.* (1997) and Deotale *et al.* (1998). The various growth and yield characters in different cultivar of brinjal were also reported by Rai *et al.* (1998).

Fruit diameter (mm):

Like other yield and growth parameters significant variations were observed in the fruit diameter among the brinjal cultivars (Table 1). Round shaped cultivars Surya Kiran (67.96 mm) and Pant Rituraj (46.01 mm) showed the maximum diameter of fruits, fallowed by long fruited cultivar Nishant (42.18 mm) and PB-67 (38.43 mm). Chaya gave the minimum fruit diameter. Similar types of findings were also reported by Mohanty *et al*. (2001) and Rai *et al*. (1998), who reported seven round shaped brinjal cultivars for their yield attribute.

Fruit stalk length (cm) :

Significant differences were found among the cultivars for fruit stalk length hybrid PPL-74 ranked 1 in term of fruit stalk length (6.98 cm) followed by Chaya (6.66 cm) and Pant Rituraj (6.43 cm). Minimum fruit stalk length (5.18 cm) was found in Nishant. The highest fruit stalk length of these cultivars may be attributed the more fruit length, biomass and varietal character. Such kind of findings are in agreement with that of Rai *et al*. (1998) in round shaped brinjal hybrids evaluated in Raipur (M. P.) condition.

Marketable yield (q/ha) :

Fresh fruit yield averaged data of two year (2011-12 and 2012-13) in the Table 1 and Fig. 1 indicate significant variation under different cultivars. The hybrid PPL-74 recorded maximum fruit yield (712.26 q/ha) followed by Nishant (549.90 q/ha) and Chaya (498.98 q/ha). These observations of present study are in conformity with the findings reported by Jaiswal *et al.* (1997) and Srivastava *et al.* (1997). The differences among the cultivars are due to the climatic and genetic factors. The minimum marketable yield under mid hill situation of uttarakhand was found in Surya Kiran (245.83 q/ha) hybrid of brinjal. Similar types of findings were also reported by Rai *et al.* (1998).

Conclusion:

From the findings of present investigation it can be concluded that brinjal hybrid PPL-74 was found superior for most of morphological and yield characters. On the basis of these findings brinjal cultivars PPL-74 fallowed by Chaya are recommended as commercial cultivars for their yield and morphological characters under mid hill condition of Uttarakhand.

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