

Performance of various brinjal (*Solanum melongena* L.) genotypes under foothill condition of Nagaland

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ABSTRACT

A field experiment was conducted during kharif season of 2017 at the Experimental Farm, School of Agricultural Sciences and Rural Development, Medziphema Campus, Nagaland University to evaluate the performance of different genotypes of brinjal (*Solanum melongena* L.) under foothill condition of Nagaland. Eighteen genotypes of brinjal were evaluated with three replications in randomized block design. Results revealed that BRLVAR-12 exhibited maximum number of leaves plant⁻¹ (85.37), number of branches plant⁻¹ (24.77), number of fruit plant⁻¹ (52.20) and fruit yield (416.3 q ha⁻¹). BRLVAR-15 genotype produced tallest plant (101.6 cm) and BRLVAR-13 genotype recorded maximum leaf area index (3.34), fruit diameter (7.89 cm), fresh weight of fruit (299.5 g) and vitamin C content (8.57 mg100⁻¹g). The genotype BRRVAR-6 exhibited least number of seeds fruit⁻¹ while highest TSS was found in Azad Brinjal (5.19°B). Thus, from these results it can be conclude that genotype BRLVAR-12 was found to be potential yielder while genotype BRRVAR-5 showed poor performance under foothill condition of Nagaland

Keywords: Binjal, genotypes, growth, quality, yield, foot hill condition

INTRODUCTION

Brinjal (*Solanum melongena* L.) belongs to family Solanaceae. Brinjal is native to India and it has been in cultivation in India since ancient times. It is typical day neutral plant and often cross pollinated due to heterostyle. It is rich in minerals Ca, Mg, P, K, and Fe. It is good source of vitamin B. Purple variety has higher copper content and polyphenol oxidase activity whereas iron and catalase activity is highest in the green cultivars. Pigmented, dark purple brinjal has more vitamin C than those with white skin. Anthocyanin pigment present in the fruit is responsible for purple colour of fruit skin. Amino acid content is higher in purple variety. Bitterness in brinjal is due to presence of glycoalkaloids i.e. solasodine. Generally high amount of glycoalkaloids (20 mg 100⁻¹g fresh weight) produces a bitter taste and off flavour. White brinjal is said to be good for diabetic patients. It can cure toothache if fried brinjal fruit in tin oil is taken and acts as an excellent remedy for those suffering from liver complaints (Kanaujia *et al.*, 2020). The estimated area, production and productivity of brinjal plants in India are about 0.6 million hectare, 1.2 million tonnes and 18.5 t/ha respectively (IHD, 2017). The potential of brinjal as fresh vegetable is not fully exploited. Before recommendation of any

variety suited for the region, it is necessary to evaluate genotypes, giving emphasis on the aspects of genotypic suitability and yield. Varietal performance of brinjal varies from place to place due to the varied agro-climatic conditions do not remain same for all the regions. Considering all the above mentioned facts, a pertinent need was felt to undertake an experiment on the evaluation of brinjal genotypes under foothill condition of Nagaland so as to identify, the best genotype suited for the agro-climatic condition of foothill of Nagaland.

MATERIALS AND METHODS

The present investigation was carried out at Experimental Farm of Horticulture, School of Agricultural Sciences and Rural Development, Nagaland University, Medziphema Campus, Nagaland during *kharif* season of 2017. The experimental site is located at an altitude of 310 m above mean sea level, with geographical location of 25°45'43"N latitude and 93°33'04"E longitude. The experimental material comprised eighteen genotypes i.e. BRRVAR-1, BRRVAR-2, BRRVAR-3, BRRVAR-4, BRRVAR-5, BRRVAR-6, BRRVAR-7, BRRVAR-8, BRLVAR-9, BRLVAR-10, BRLVAR-11, BRLVAR-12, BRLVAR-13, BRLVAR-14, BRLVAR-15, BRLVAR-16, Manipur Local and Azad Brinjal.All

the eighteen genotypes were evaluated in a randomized block design with three replications. Nursery was raised under low cost polyhouse. Sowing of seed was done on 10th February, 2017. Thirty days old, healthy and uniform seedlings free from insect pests and diseases having good root system of about 10-15 cm height having 3-4 true leaves were transplanted to the well prepared raised beds in the main field. Plot size and spacing was maintained 1.8 x 1.8m and 60 x 60cm, respectively. Recommended cultural practices and plant protection measures were followed. Observations were recorded for plant height, number of leaves plant⁻¹, number of branches plant⁻¹, LAI, fruit length, fruit diameter, number of fruits plant⁻¹, fresh weight of fruit, fruit yield, number of seeds fruit⁻¹. Vitamin C content was determined as given by A.O.A.C (1984), Total soluble solid (TSS) was determined using hand refractometer and results expressed in °brix. Harvesting was done 100 days after transplanting when the fruits developed good colour and marketable size but still immature. Fruits were harvested usually in the afternoon to avoid sun scalding. Leaf area index (LAI) of the plant was recorded by the formula given by Konyeha and Alatisse (2013). Experimental data were statistically analysed as suggested by Panse and Sukhatme (2000).

RESULTS AND DISCUSSION

Growth parameters

The data (Table 1) revealed significant differences under all the genotypes. The plant height of all the eighteen genotypes ranged between 68.2 and 101.6 cm. The results showed that genotype BRLVAR-15 recorded maximum plant height of 101.6 cm and found significantly higher than other genotypes. The genotype BRLVAR-11 recorded least height of 68.2 cm. The genotype BRLVAR-12 exhibited maximum number of leaves plant⁻¹ (85.37), number of branches plant⁻¹ (24.77). The genotype BRRVAR-7 exhibited minimum number of leaves (51.50) and genotype BRRVAR-5 showed least number of branches (11.20). The highest LAI was recorded in genotype BRLVAR-13 (3.34) while lowest LAI was observed in BRRVAR-6 (1.28). The present findings were in agreement with Pandit *et al.* (2010), Singh *et al.* (2011) and Kanaujia and Phom (2016). Results revealed that the number of branches plant⁻¹ has direct effect on the number of leaves plant⁻¹. The attainment of highest and lowest records in growth parameters may be due to genetic makeup of the plant which indirectly governs the morphology of the plant.

Table 1: Performance of brinjal genotypes for growth parameters

Genotypes	Plant height(cm)	Leaves plant ⁻¹ (cm)	Branches plant ⁻¹ (cm)	LAI
BRRVAR-1	75.2	78.23	18.80	2.15
BRRVAR-2	71.9	78.53	18.83	2.27
BRRVAR-3	77.9	77.90	19.10	2.57
BRRVAR-4	71.5	58.40	18.90	1.47
BRRVAR-5	70.0	55.13	11.20	1.81
BRRVAR-6	82.1	69.37	20.00	1.28
BRRVAR-7	68.5	51.50	13.97	1.33
BRRVAR-8	80.0	72.97	19.10	1.58
BRLVAR-9	86.3	71.73	21.73	1.45
BRLVAR-10	71.1	71.33	19.57	2.01
BRLVAR-11	68.2	81.70	17.87	2.96
BRLVAR-12	76.1	85.37	24.77	2.09
BRLVAR-13	80.5	54.83	18.90	3.34
BRLVAR-14	88.0	58.93	19.57	2.39
BRLVAR-15	101.6	67.73	21.73	1.78
BRLVAR-16	78.2	74.40	19.20	2.34
Manipur Local	68.4	68.83	14.60	1.73
Azad Brinjal	82.1	63.87	17.93	2.15
SEm±	2.35	1.47	0.56	0.15
CD (P=0.05)	6.78	4.28	1.62	0.43

Yield and yield attributes

The observation showed that the different genotypes differed significantly among themselves in regard to yield attributes of brinjal (Table 2). The longest fruit length (17.0 cm) was found in genotype BRLVAR-11 and shortest fruit length (7.8 cm) in BRRVAR-6. The maximum fruit diameter (7.89 cm) was obtained from genotype BRLVAR-13 whereas minimum was recorded in genotype BRLVAR-11 (2.89 cm). The different genotypes differed significantly among themselves in regard to number of fruits plant⁻¹. The genotype BRLVAR-12 recorded maximum number of fruits plant⁻¹ (52.20). Genotype BRLVAR-13 exhibited lowest number of fruits plant⁻¹ (4.17). The genotype BRLVAR-13 exhibited maximum fresh weight (299.5 g) while genotype BRRVAR-6 recorded

least fresh weight (66.2 g). The least number of seeds fruit⁻¹ (654.6) was recorded in genotype BRRVAR-6 while highest seeds (1364.0) were found in genotype BRLVAR-13. The results were similar with the findings of Kumar *et al.* (2012), Ralte and Kanaujia (2015) and Sanga *et al.* (2017). Fruit yield is the most important complex trait in brinjal. Different genotypes showed significant effect on fruit yield. The fruit yield of all the eighteen genotypes ranged between 59.6 and 416.3 q ha⁻¹. The genotype BRLVAR-12 recorded maximum fruit yield (416.3 q ha⁻¹). The genotype BRRVAR-5 exhibited lowest fruit yield (59.6 q ha⁻¹). It is found that number of fruit plant⁻¹ is directly related to fruit yield. It is influenced by genetic and environmental effects. The results were in close conformity from the findings of Sharma and Banyal (2016), Kanaujia and Phom (2016) and Sanga *et al.* (2017).

Table 2: Performance of brinjal genotypes for yield and quality parameters

Genotypes	Fruit length (cm)	Fruit diameter (cm)	No. of fruit plant ⁻¹	Fresh weight of fruit(g)	Fruit yield (q ha ⁻¹)	No. of Seed fruit ⁻¹	Vitamin C content (mg 100 ⁻¹ g of fruit)	TSS (°B)
BRRVAR-1	11.3	6.42	5.87	181.9	105.4	1073.3	5.71	4.68
BRRVAR-2	11.8	6.19	7.57	203.6	78.3	1049.7	5.71	4.53
BRRVAR-3	12.4	7.06	6.57	172.9	61.4	1029.7	4.95	3.63
BRRVAR-4	11.4	5.81	6.89	190.5	109.0	955.3	5.71	3.69
BRRVAR-5	8.3	4.72	8.37	132.9	59.6	701.0	7.14	4.07
BRRVAR-6	7.8	4.53	16.80	66.2	90.3	654.6	5.33	3.96
BRRVAR-7	8.3	5.68	7.33	154.0	62.6	846.6	5.04	4.23
BRRVAR-8	11.0	5.59	16.47	151.1	144.7	878.6	3.42	4.25
BRLVAR-9	11.5	5.41	18.53	105.1	161.8	746.3	3.71	4.68
BRLVAR-10	9.1	5.29	24.73	95.3	211.3	838.4	5.33	4.64
BRLVAR-11	17.0	2.89	43.50	159.8	305.5	777.3	5.90	3.33
BRLVAR-12	15.8	3.27	52.20	114.8	416.3	847.4	3.71	4.24
BRLVAR-13	14.9	7.89	4.17	299.5	119.2	1364.0	8.57	4.70
BRLVAR-14	13.3	6.11	26.73	152.3	331.4	970.0	5.71	4.07
BRLVAR-15	15.9	3.57	21.47	153.7	292.7	832.6	6.57	4.67
BRLVAR-16	15.9	3.19	44.50	100.6	380.8	877.0	7.14	3.00
Manipur Local	16.4	3.17	19.60	98.5	161.4	765.3	4.00	4.36
Azad Brinjal	10.8	5.79	7.13	149.5	111.8	864.0	2.85	5.19
SEm±	0.56	0.32	2.03	12.4	16.7	44.9	0.41	0.17
P=0.05	1.61	0.92	5.85	35.8	48.0	129.1	1.18	0.49

Quality attributes

The genotypes under quality attributes showed significant variation (Table 2). The vitamin C content of all the eighteen genotypes was ranged between 2.85 and 8.57 mg 100⁻¹g of fruit. The highest vitamin C content (8.57 mg100⁻¹g) was exhibited in genotype BRLVAR-13 whereas least (2.85 mg100⁻¹g) was revealed in

genotype Azad Brinjal. The TSS of all the eighteen genotypes was ranged between 3.00 and 5.19°B. The maximum TSS (5.19°B) was observed in genotype Azad Brinjal and minimum TSS (3.00°B) in BRLVAR-16. The attainment of highest and least quality attributes in different genotypes might be due to genetic factor or environmental factor prevailing during the trail. The present findings were in agreement with

Kanaujia and Phom (2016) and Sanga *et al.* (2017).

From the present studies, it may be concluded that the genotype BRLVAR-12 was found high yielding and good for fresh marketing.

Thus, genotype BRLVAR-12 can be recommended as better genotype for commercial cultivation in foothill conditions of Nagaland.

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