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Characterization and evaluation of brinjal genotypes

S. RAMESH BABU AND R.V. PATIL
Department of Horticulrue, UAS, Dharwad – 580 005.

Abstract : An experiment was carried out at Golden Jubilee Block, Kumbapur Farm, Dharwad to evaluate ninety brinjal genotypes. Twelve quantitative characters were analysed and had shown significance for all the characters. Among 90 brinjal genotypes the top ranking five genotypes in terms of yield in descending order are DBC-75-KA (3280.00g), DBC-38-HA (3615.00g), DBC-13-BA (3032.00g) and DBC-14-KA (3020.00 g).The earlist genotypes were DBC-l-TR and DBC-9-KA which had come to 50 % flowering in 36 days. But local check DBC-107-KA (Malapur Local) had given only 850.0 g / plant and come to maturity in 47 days.

Key words: Characterization, evaluation, brinjal genotypes

Introduction

Thorough evaluation of the genotypes is needed to know the performance of the genotypes in terms of yield and other yield attributing characters. Based on this, promising genotypes can be identified. The genotypes performing well can be released as a variety or it can be put to further use in the breeding programme as a breeding line by the breeder. Hence, an experiment was carried out to evaluate 90 brinjal genotypes for 12 characters.

Materials and Methods

Ninety brinjal genotypes were evaluated for 12 characters in a Randomized Block Besign (RBD) each in two replications at Vegetable Section of Golden Jubilee Block , Kumbapur Farm, University of Agricultural Sciences, Dharwad, during 2000-2001 from the germplasm maintained at UAS Dharwad. Cultural practices were followed as per the package of practices of UAS (Darwad, 1991). Observations were recorded from the three plants selected randomly in each genotype. The leaf area was measured with Leaf area meter, stem girth, fruit length and fruit diameter were calculated using Vernier Calipers and fruit weight was calculated using simple balance.

Results and Discussion

Analysis of variance was carried out for 12 characters in 90 brinjal genotypes. The genotypic variance for all the characters was highly significant indicating wide variability for all the characters studied.

Per se performance of all 90 brinjal genotypes was given in table 1. The top five ranked genotypes in terms of yield in descending order were DBC-18-AP (3665.00 g/plant),DBC-75-KA (3280.00 g/plant), DBC-38-KA(3165-00 g/plant), DBC-13-BI (3032.00 g/ plant) and DBC-14-KA(3020.00 g/plant) and all these genotypes differed for the shape and colour of the fruit. Genotype DBC-18-AP which recorded higher yield was purple fruited but the shape of the fruit was long. Among 90 genotypes, 28 were striped fruited genotypes. Of all striped fruited genotypes DBC-68-KA was higher yielder with 2947.50 g/plant. The

Table 1. *Per se* performance of 90 brinjal genotypes for twelve quantitative characters

S. No.	Genotypes	Leaf area (cm^2)	Stem girth (cm)	Plant height at 50% flowering	No.of branches/ plant	Days to 50% flowering	No.of flowers/ cluster	No.of fruits/ cluster	Fruit length (cm)	Fruit diameter (cm)	Fruit weight (g)	No.of fruits/ plant	Yield/ plant (g)
1	DBC-l-TR	20.74	1.64	18.85	7.30	36.00	3.33	1.00	8.60	3.68	37.75	41.50	1691.25
2	DBC-2-KA	36.16	1.98	20.59	6.00	43.00	2.16	1.00	5.43	4.88	42.83	26.50	1256.74
3	DBC-7-MP	62.75	1.85	22.25	5.49	53.00	5.66	1.00	5.88	4.75	46.50	27.00	1649.00
4	DBC-8-KA	26.82	2.45	23.58	7.16	61.00	3.33	1.00	6.32	6.26	58.67	28.50	1797.12
5	DBC-9-KA	37.88	2.35	31.36	6.83	36.00	2.49	1.00	6.13	4.38	53.67	30.00	1735.28
6	DBC-10-BI	61.10	1.75	28.83	6.16	43.00	2.83	2.00	5.75	4.81	48.33	32.50	1699.90
7	DBC-11-BI	69.65	1.75	20.00	7.00	50.00	2.83	1.00	12.25	4.90	82.50	16.00	1447.50
8	DBC-12-BI	50.62	1.66	14.75	7.00	50.00	4.16	3.00	5.35	3.35	62.50	25.50	1715.00
9	DBC-13-BI	54.74	1.95	25.67	7.00	39.00	3.50	1.00	10.20	6.55	142.50	20.00	3032.50
10	DBC-14-KA	53.26	1.63	20.00	4.50	44.00	3.15	1.00	5.93	4.95	95.00	30.50	3020.00
11	DBC-15-AP	34.97	1.52	16.80	4.00	55.00	1.66	1.50	4.45	4.56	47.50	36.50	1870.00
12	DBC-16-AP	25.78	1.56	17.67	6.49	55.00	3.50	1.00	5.76	4.85	36.50	35.00	1398.00
13	DBC-17-AP	53.12	2.28	23.50	7.16	48.00	4.33	3.00	9.53	2.49	43.30	45.00	2068.00
14	DBC-18-AP	50.90	2.35	22.60	8.00	44.00	3.50	1.00	6.30	6.93	112.50	31.50	3665.00
15	DBC-19-KA	56.50	2.18	24.08	7.33	40.00	2.33	1.00	6.58	5.88	137.50	20.50	2945.00
16	DBC-20-KA	61.97	1.91	14.00	7.50	47.00	4.50	1.00	6.30	3.10	42.50	23.50	1125.00
17	DBC-21-PU	32.37	1.90	25.58	8.16	47.00	2.16	1.00	13.80	2.37	26.00	36.50	1072.00
18	DBC-22-PU	39.00	1.90	22.00	7.33	47.00	2.33	1.00	5.27	4.36	41.00	37.50	1661.00
19	DBC-23-KA	34.74	1.62	24.92	7.33	47.00	2.16	1.00	5.36	3.02	24.17	37.00	1018.27
20	DBC-25-KA	54.64	1.55	25.50	7.50	43.00	3.33	1.00	6.11	4.60	59.17	35.00	2194.94
21	DBC-26-KA	48.03	2.28	24.33	7.50	47.00	2.49	1.00	7.55	4.61	47.50	31.50	1622.50
22	DBC-27-KA	47.83	2.20	29.67	7.33	52.00	2.00	1.00	6.55	3.85	45.80	31.00	1545.60
23	DBC-29-TA	32.90	1.70	16.75	6.16	55.00	2.00	1.00	6.03	4.55	40.83	27.50	1248.24
24	DBC-30-TA	49.14	1.50	31.08	7.63	39.00	2.16	1.00	7.86	6.43	67.50	32.00	2287.50
25	DBC-31-HA	37.50	2.00	16.83	13.66	47.00	2.16	1.00	8.36	6.15	94.17	23.50	2339.96
26	DBC-33-HA	39.66	2.32	17.08	12.66	49.00	3.33	1.00	6.39	4.90	105.00	22.00	2440.00
27	DBC-34-HA	41.36	1.76	20.75	12.49	43.00	3.66	1.00	6.70	5.16	104.17	27.50	2991.62

Table 1 Continued .....

S. No.	Genotypes	Leaf area (cm^2)	Stem girth (cm)	Plant height at 50% flowering	No.of branches/ plant	Days to 50% flowering	No.of flowers/ cluster	No.of fruits/ cluster	Fruit length (cm)	Fruit diameter (cm)	Fruit weight (g)	No.of fruits/ plant	Yield/ plant (g)
28	DBC-35-HA	34.23	1.65	17.92	9.83	47.00	3.33	2.60	7.85	3.10	77.50	32.00	2607.50
29	DBC-36-HA	40.06	2.38	20.33	10.50	43.00	3.00	1.66	11.76	4.38	102.50	21.00	2280.00
30	DBC-37-HA	46.95	2.38	18.83	8.50	44.00	3.16	1.00	8.22	7.28	107.50	17.50	2010.00
31	DBC-38-HA	27.26	1.69	21.13	11.83	38.00	2.16	1.68	12.95	3.77	112.50	27.00	3165.00
32	DBC-39-HA	50.15	1.35	15.50	11.50	55.00	3.32	2.00	10.63	4.11	62.50	27.00	1815.00
33	DBC-40-HA	18.81	1.82	18.75	10.83	44.50	2.50	1.00	11.00	5.93	97.50	24.00	2467.00
34	DBC-42-HA	62.19	1.55	20.94	7.83	48.50	2.00	1.00	10.82	4.50	59.17	23.50	1515.79
35	DBC-43-HA	47.44	1.68	27.33	5.66	37.50	4.16	1.00	12.50	4.70	102.50	26.50	2815.00
36	DBC-44-HA	43.36	1.87	27.01	7.49	54.50	3.00	2.00	15.50	5.10	61.83	22.50	1516.60
37	DBC-46-HA	43.76	2.38	35.69	6.49	47.00	2.16	1.00	6.20	3.60	26.50	20.00	656.50
38	DBC-47-HA	65.66	2.00	11.50	3.83	47.00	4.16	4.50	10.80	5.85	77.50	31.00	2530.00
39	DBC-49-HA	53.56	1.55	11.16	6.83	42.50	2.33	2.00	12.50	4.75	93.83	22.00	2195.77
40	DBC-50-HA	38.58	2.20	40.13	5.00	48.00	2.83	1.00	22.10	3.45	59.17	29.50	1869.95
41	DBC-53-HA	49.41	1.98	22.00	8.00	53.00	3.68	1.00	12.60	3.06	72.50	23.50	1832.50
42	DBC-54-HA	50.12	1.80	18.05	5.00	52.00	4.33	4.00	11.18	3.62	56.50	35.00	2101.00
43	DBC-56-HA	56.36	1.21	25.83	5.33	50.00	3.49	1.00	10.83	3.98	65.83	31.00	2166.56
44	DBC-58-HA	40.21	1.75	11.60	8.33	50.00	2.00	1.00	7.36	3.88	44.00	28.50	1379.50
45	DBC-65-HA	44.92	1.63	27.25	4.50	44.00	2.66	1.00	11.47	3.60	45.83	30.50	1523.23
46	DBC-66-HA	42.00	2.05	16.08	10.66	49.00	2.00	1.00	5.55	5.25	87.50	33.00	3015.00
47	DBC-68-KA	41.99	2.05	35.21	6.50	49.00	2.00	1.00	7.00	7.55	135.00	20.50	2947.50
48	DBC-75-KA	72.31	1.95	21.30	4.50	50.00	2.66	1.00	9.11	7.65	150.00	21.00	3280.00
49	DBC-76-KA	37.19	2.20	17.00	6.00	47.00	2.00	1.00	8.88	8.66	121.50	19.50	2496.00
50	DBC-77-KA	41.80	2.22	29.33	6.16	49.00	2.66	1.33	6.68	6.18	81.67	24.50	2126.62
51	DBC-79-KA	34.55	1.98	28.17	5.66	48.00	2.66	1.00	7.70	6.82	139.67	16.50	2431.31
52	DBC-80-KA	58.25	1.85	33.16	7.50	50.00	3.49	1.00	6.10	6.75	150.00	17.50	2710.00
53	DBC-81-BI	41.50	2.05	24.33	8.50	55.00	2.66	1.00	8.65	8.45	145.00	15.50	2375.00
54	DBC-82-TA	32.49	1.91	17.17	7.76	55.00	2.58	1.00	7.50	5.45	80.65	24.00	2076.50
55	DBC-83-AP	35.88	1.91	33.47	11.00	55.00	2.88	1.00	4.47	4.50	36.67	35.00	1409.94

Table 1 Continued .....

S. No.	Genotypes	Leaf area (cm^2)	Stem girth (cm)	Plant height at 50% flowering	No.of branches/ plant	Days to 50% flowering	No.of flowers/ cluster	No.of fruits/ cluster	Fruit length (cm)	Fruit diameter (cm)	Fruit weight (g)	No.of fruits/ plant	Yield/ plant (g)
56	DBC-84-KA	45.99	2.00	32.35	7.33	49.00	2.49	2.00	5.97	5.79	51.67	27.50	1546.62
57	DBC-85-KA	52.36	1.96	18.42	7.50	55.00	3.33	1.00	9.38	5.55	54.17	22.50	1345.79
58	DBC-88-KE	51.54	2.05	12.23	8.40	55.00	3.66	3.00	11.10	4.86	73.33	20.50	1629.93
59	DBC-89-ND	51.57	1.41	17.00	5.65	55.00	2.66	1.00	16.60	3.59	56.65	21.00	1316.63
60	DBC-91-ND	57.50	1.05	26.50	5.33	49.00	3.16	2.66	12.40	3.90	46.50	27.50	1403.00
61	DBC-94-KE	45.34	1.88	27.75	4.00	55.00	4.49	3.16	17.81	3.56	52.50	21.00	1225.00
62	DBC-95-KA	32.41	2.75	23.75	8.68	49.00	3.00	1.00	9.65	9.10	122.50	16.50	2147.50
63	DBC-96-KA	32.72	1.85	26.50	6.00	49.00	2.91	1.00	5.98	4.16	73.00	19.50	1549.50
64	DBC-97-TA	39.95	1.75	27.72	6.95	45.00	3.68	1.00	7.30	5.36	65.83	25.50	1804.08
65	DBC-98-TA	42.42	1.95	28.67	7.90	55.00	2.50	1.00	6.12	5.45	32.50	24.00	910.00
66	DBC-99-KA	44.04	1.95	19.50	5.49	49.00	2.88	1.00	6.83	4.70	36.50	23.50	983.50
67	DBC-100-KA	30.56	1.66	25.44	5.16	55.00	3.23	2.00	7.95	6.45	37.00	25.00	1052.00
68	DBC-101-KA	33.55	1.95	25.48	9.47	55.00	2.15	1.00	3.75	3.55	32.50	34.00	1227.50
69	DBC-102-KA	36.50	2.40	26.50	8.47	49.00	3.05	1.00	5.40	4.88	36.50	22.50	948.50
70	DBC-103-KA	39.28	1.70	15.70	6.80	50.00	3.00	2.00	6.40	6.30	72.50	24.50	1902.50
71	DBC-104-MH	34.37	2.50	17.75	6.83	49.00	2.50	1.00	4.05	3.26	34.50	17.50	731.00
72	DBC-105-MH	41.80	2.37	27.42	8.97	55.00	3.33	1.00	5.82	4.80	50.00	31.00	1680.00
73	DBC-106-MH	41.80	2.37	27.42	8.99	55.00	3.33	1.00	5.82	4.80	50.00	31.00	1680.00
74	DBC-107-KA	58.44	2.16	23.70	6.70	49.00	2.15	1.00	6.41	6.35	102.50	15.00	1660.00
75	DBC-108-KA	4.29	2.03	35.00	6.65	51.00	2.00	1.00	5.75	3.30	68.50	16.50	1257.00
76	DBC-109-TR	44.92	1.88	29.50	6.95	47.00	3.00	1.00	8.40	5.85	149.00	16.00	2508.00
77	DBC-111-KA	76.14	1.80	32.95	2.80	53.00	5.13	4.00	10.88	3.50	82.50	17.00	1532.00
78	DBC-112-GO	42.15	2.58	21.50	7.47	47.00	3.20	2.00	4.85	4.00	50.00	17.50	992.50
79	DBC-113-GO	46.76	2.25	35.00	6.47	53.00	1.65	1.00	4.90	4.00	47.50	20.00	1082.50
80	DBC-114-GO	56.64	2.60	35.00	8.50	47.00	5.00	1.00	5.70	4.40	42.50	25.50	1210.00
81	DBC-115-KA	52.90	1.75	20.50	5.50	50.00	5.00	3.66	10.95	2.98	42.25	38.50	1752.00
82	DBC-116-UP	56.82	1.30	27.00	6.16	44.00	3.00	2.33	11.00	2.98	27.50	36.00	1116.00
83	DBC-117-UP	58.38	1.85	28.08	4.49	44.00	3.16	1.66	5.58	4.75	52.50	24.50	1412.50

Table 1 Continued .....

S. No.	Genotypes	Leaf area (cm^2)	Stem girth (cm)	Plant height at 50% flowering	No.of branches/ plant	Days to 50% flowering	No.of flowers/ cluster	No.of fruits/ cluster	Fruit length (cm)	Fruit diameter (cm)	Fruit weight (g)	No.of fruits/ plant	Yield/ plant (g)
84	DBC-118-KA	57.21	1.95	27.63	6.83	44.00	2.00	1.00	5.69	4.65	51.50	33.50	1851.00
85	DBC-119-KA	45.61	1.95	24.97	5.33	47.00	1.00	1.00	7.36	6.98	82.50	22.50	1982.50
86	DBC-120-KA	47.76	1.58	23.65	5.33	50.00	4.33	2.00	14.60	2.28	40.17	37.00	1612.94
87	DBC-121-KA	46.97	1.57	17.50	3.49	47.00	5.00	3.00	6.58	3.12	34.67	32.00	1235.95
88	DBC-122-KA	57.94	1.75	27.67	6.83	50.00	4.50	2.00	16.65	2.85	35.33	48.00	1822.17
89	DBC-123-KA	52.40	1.35	21.50	3.33	47.00	5.00	3.33	7.86	3.00	42.50	31.50	1465.00
	(Local check: Malapur local)												
90	DBC-107-KA	39.28	1.85	14.50	4.80	49.00	2.00	2.00	5.41	4.73	42.50	16.50	822.50
	S.Em+/-	2.45	0.15	1.69	0.54	0.60	0.33	0.38	0.25	0.19	3.91	1.87	194.12
	CD 5%	6.78	0.41	4.68	1.49	1.67	0.91	1.05	0.70	0.52	10.83	5.17	537.70
	CD1%	8.91	0.85	6.15	1.96	2.19	1.19	1.39	0.92	0.68	14.23	6.80	706.59

genotypes of green fruits with creamy patches at stylar end were preferred along the West Coast (Udipi, Karwar) and DBC-75-KA was a promising genotype of that type. However, local check which was DBC-107-KA (Malapur Local) yielded 822.50 g/plant only.

All the top ranking genotypes in terms of yield had solitary fruit bearing habit except DBC-38-HA. Flowers of egg plant under local climatic conditions of Dharwad usually produced single fruit per cluster. This was for non cluster bearing genotypes. However, some genotypes often produced more than one fruit per cluster because of cool season. In cluster bearing genotypes (DBC-84-KA, DBC-88-KE, DBC-91-ND etc) interactions were observed between fruit number and position in the cluster and growth of individual fruits as basal fruits were heavier than others. These results were in harmony with the findings of Nothmann and Rylski (1983).

Sufficient variation was observed for days to 50 per cent flowering and it ranged from 36 to 61 days. The yield of earliest flowering genotypes DBC- l-TR (1691.25 g) and DBC-9-KA (1735.28 g) was on par with the late flowering genotypes DBC -8-KA (1797.12 g). This indicated that earlier flowering genotypes could be used in the breeding programme to necessitate serial harvesting over wide number of days to avoid market glut and to exploit higher prices during certain parts of the year. In the present study it was recorded that the first (DBC- 18-AP), third (DBC- 38-HA) and fourth(DBC-13-BI) higher yielding genotypes yielded early in 44, 38 and 39 daysrespectively.

The yield being polygenic trait, is a result of component characters like number of fruits per plant and fruit weight. The higher yield in the top ranked genotypes was attributed to higher number of fruits per plant and fruit weight (DBC-75-KA and DBC-13-BI). The range for number of fruits per plant was from 15 (DBC-108-KA) to 48 (DBC-123-KA) while, fruit weight ranged from 24.17 (DBC- 23-KA) to 150 g (DBC-75-KA and DBC-80-KA). Similar findings were also reported by Yadav *et al.* (1997) and Sanwal *et al.* (1998). Any deviation in the results with the findings of others was attributed to differences in the genotypes under study, environmental conditions and the stage of harvest of fruits.

Generally, the increase in the fruit weight in the present findings was attributed to higher fruit length and fruit diameter while, increase in the number of fruits per plant was attributed to higher plant height at 50% flowering and /or number of branches per plant. The average fruit length and fruit width in 90 genotypes were 8.3 and 4.8 cm respectively. Similar findings were also reported by Amarchand *et al* (1994), Ponnuswami and Irulappan (1994) and Yadav *et al.* (1997). The higher yield per plant in DBC-75-KA DBC-13-BI, DBC- 14-KA and DBC-19-KA was also attributed to increased leaf area. Higher the leaf area, higher will be the photosynthetic surface and so the higher photosynthate accumulation resulting higher yield. However, genotypes DBC-18-AP, DBC-38-HA, DBC-66-HA and DBC 33-HA with less leaf area also had higher yield. This was attributed to reduced shade effect on the lower leaves which other wise would have been parasitic on upper leaves. Hence, it is concluded that yield is a genotype dependent activity in the present study.

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