

Evaluation of chilli genotypes for ghataprabha left bank command area in Karnataka

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ABSTRACT

Thirty seven genotypes were assessed for their growth and yield potential to identify a superior variety for commercial cultivation under Ghataprabha Left Bank Command area conditions in north Karnataka. Maximum plant height was recorded in DCS-104 (75.48 cm), maximum plant diameter was recorded in DCA-127 (1.40 cm), maximum crown size was recorded in DCA-104 (59.14 cm). Matured dry chilli yield varied from 12.44 quintals per hectare to 37.79 quintals per hectare. Genotype DCA-101 emerged as superior high yielding variety with dry chilli yield of 37.79 quintals per hectare closely followed by DCA-104 (35.66 q/ha) and highest ascorbic acid content (134.61 mg/100 g) was found in DCA-127.

Key words : Genotype, Chilli, Plant height, Crown size, Primary branches.

Chilli (*Capsicum annuum* L.) is an important spice cum vegetable crop grown on a large area in Karnataka. In India, chilli is being grown on an area of 0.92 million hectares with a production of 1.01 million tonnes of dry chilli with a productivity of 1.11 tonnes per hectare (Kallapurackal and Ravindran, 2004). In Karnataka, the area under chilli cultivation is 1.86 lakh hectares with annual production of 4.45 lakh tonnes (Anon., 2001). Many improved and high yielding varieties have been released and recommended for commercial cultivation for different agro-climatic regions of our country. Farmers of Ghataprabha Left Bank Command (GLBC) area are still in the use of local cultivars which are very poor yielders. There is an urgent need to identify a superior variety of chilli for GLBC area in north Karnataka.

MATERIALS AND METHODS

The study was conducted at Spices and Plantation Crops unit of Kittur Rani Channamma College of Horticulture, Arabhavi in Belgaum district (Karnataka) during *kharif* 2006-07. The experiment was conducted with 37 genotypes in a randomized block design with three replications. Healthy and uniform seedlings were transplanted with a spacing of 75 cm x 45 cm of line planting in a plot size of 3.37 m² by accommodating 10 plants. For recording various observations, five plants in each experimental plot were randomly selected. The selected plants were tagged for taking observations on various growth and yield parameters like plant height, crown size, plant diameter, number of primary branches,

number of secondary branches, number of fruits per plant, matured ripe fruit weight, dry fruit weight, matured ripe chilli yield and dry chilli yield.

RESULTS AND DISCUSSION

The results obtained on different growth and yield parameters are presented in Tables 1, 2 and 3. Significant differences were observed for the characters studied. The plant height ranged from 44.25 to 75.48 cm. Genotype DCA-104 recorded maximum plant height (75.48 cm) which was at par with DCA-101 (73.29 cm), DCA-131 (71.59 cm), DCA-118 (70.95 cm), DCA-134 (70.09), DCA-111 (69.66 cm), DCA-102 (69.21 cm) and DCA-132 (68.60 cm) and minimum was recorded in DCA-116 (44.25 cm). There are several reports, which indicate the variation in plant height among the chilli genotypes under different agro-climatic situations (Elangovan *et al.*, 1982; Natarajan *et al.*, 1988; Abusaleha, 1998; Natarajan *et al.*, 1994 and Usharani, 1996). The plant diameter was highest in DCA-127 (1.40 cm) followed by DCA-118 (1.37 cm), DCA-126 (1.31 cm), DCA-104 (1.29 cm) and the lowest plant diameter (0.76 cm) was recorded in DCA-116. The crown size varied from 38.23 cm to 59.14 cm. Higher crown size (59.14 cm) was noticed in the genotype DCA-104, which was at par with DCA-101 (56.88 cm), DCA-131 (55.75), DCA-129 (55.21 cm), DCA-132 (54.20 cm), DCA-102 (53.20 cm) and lower size was noticed in DCA-116 (38.23 cm). Maximum number of primary branches (5.18) was recorded in DCA-104, which was at par with DCA-101 (4.93), DCA-131 (4.88) and DCA-127 (4.68). The least number of primary branches

Table 1: Plant height, stem diameter, crown size and number of primary and secondary branches at 120 days after planting of different chilli genotypes

Sr. No.	Genotype	Plant height (cm)	Stem diameter (cm)	Crown size (cm)	No. of primary branches	No. of secondary branches
1.	DCA-101	73.29	1.21	56.88	4.93	9.65
2.	DCA-102	69.21	0.95	53.20	4.33	8.64
3.	DCA-103	68.58	0.99	48.93	4.36	8.48
4.	DCA-104	75.48	1.29	59.14	5.18	9.70
5.	DCA-105	67.28	0.98	48.44	4.26	8.30
6.	DCA-106	65.48	0.91	50.55	4.46	8.80
7.	DCA-107	66.48	0.95	51.63	3.68	7.65
8.	DCA-108	64.68	0.91	49.43	4.26	8.36
9.	DCA-109	55.61	0.88	41.05	3.63	7.96
10.	DCA-110	52.28	0.87	43.62	3.60	7.74
11.	DCA-111	69.66	1.17	49.62	4.26	8.26
12.	DCA-112	54.48	1.19	46.44	3.78	.68
13.	DCA-113	45.29	0.80	41.05	3.64	6.83
14.	DCA-114	50.66	0.91	40.57	3.93	7.75
15.	DCA-115	56.17	1.20	44.98	3.95	7.65
16.	DCA-116	44.25	0.76	38.23	3.66	7.34
17.	DCA-117	68.48	0.96	46.91	4.15	8.63
18.	DCA-118	70.95	1.37	49.44	4.23	8.60
19.	DCA-119	58.48	0.98	45.57	3.83	7.00
20.	DCA-120	50.34	0.98	39.67	3.73	7.26
21.	DCA-121	67.48	0.83	52.61	4.00	7.60
22.	DCA-122	51.34	0.83	39.90	3.78	7.05
23.	DCA-123	50.51	1.02	41.41	3.73	7.64
24.	DCA-124	53.54	0.88	40.44	3.94	7.69
25.	DCA-125	58.82	1.09	42.78	4.01	7.25
26.	DCA-126	60.18	1.31	47.08	3.88	7.65
27.	DCA-127	63.12	1.40	51.83	4.68	8.90
28.	DCA-128	47.28	0.99	40.01	3.75	6.86
29.	DCA-129	67.21	1.06	55.21	4.68	8.80
30.	DCA-130	57.51	1.13	44.82	4.00	8.80
31.	DCA-131	71.59	1.00	55.75	4.88	10.00
32.	DCA-132	68.60	0.96	54.20	4.66	8.94
33.	DCA-133	67.07	1.26	50.14	4.03	8.39
34.	DCA-134	70.09	0.77	53.00	4.16	7.76
35.	DCA-135	62.11	1.09	48.32	3.95	7.53
36.	DCA-136	60.51	0.91	45.85	3.93	7.83
37.	DCA-137	55.48	0.91	40.30	3.87	7.78
	Mean	61.08	1.02	47.79	4.10	8.07
	S.E. \pm	2.86	0.02	1.79	0.18	0.26
	C.D. (P=0.05)	8.07	0.07	5.05	0.53	0.74
	CV (%)	8.11	3.74	6.50	7.93	5.68

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was observed in DCA-110 (3.60). Such variations in the primary branches of different genotypes of chilli were also reported by Natarajan *et al.* (1994), Usharani (1996), Abusaleha (1998) and Kanthaswamy (2000). The highest number of secondary branches (10.00) was noticed in

DCA-131 followed by DCA-104 (9.70), DCA-101 (9.65), DCA-132 (8.94), DCA-127 (8.90), DCA-106 (8.80), DCA-130 (8.80), DCA-129 (8.80), DCA-102 (8.64), DCA-117 (8.63), DCA-118 (8.60), DCA-103 (8.48), DCA-108 (8.36), DCA-105 (8.30) and DCA-111 (8.26),

Table 2: Number of fruits per plant, mean matured ripe fruit weight, mean dry fruit weight, matured ripe chilli yield and dry chilli yield of different chilli genotypes

Sr. No.	Genotype	Number of fruits per plant	Mean matured ripe fruit weight (g/plant)	Mean dry fruit weight (g)	Matured ripe chilli yield (g/plant)	Dry chilli yield (g/plant)
1.	DCA-101	65.99	4.47	1.97	288.16	129.99
2.	DCA-102	60.32	3.82	1.79	225.04	103.99
3.	DCA-103	55.88	3.69	1.72	200.63	96.24
4.	DCA-104	63.01	4.20	1.95	254.99	122.81
5.	DCA-105	47.32	3.49	1.63	160.22	76.86
6.	DCA-106	45.81	4.33	1.83	191.81	83.45
7.	DCA-107	44.21	2.72	1.22	116.33	54.52
8.	DCA-108	42.99	3.10	1.65	127.25	70.77
9.	DCA-109	34.32	3.22	1.71	105.46	60.67
10.	DCA-110	43.66	2.71	1.57	115.40	68.53
11.	DCA-111	51.66	3.03	1.52	146.32	78.83
12.	DCA-112	54.06	2.85	1.63	150.11	88.32
13.	DCA-113	40.32	2.30	1.33	100.52	53.91
14.	DCA-114	49.66	2.90	1.79	139.96	86.29
15.	DCA-115	37.66	2.65	1.33	93.46	46.96
16.	DCA-116	51.99	2.93	1.61	148.13	80.36
17.	DCA-117	55.10	2.80	1.57	143.69	86.84
18.	DCA-118	56.99	2.85	1.64	154.78	93.73
19.	DCA-119	51.66	2.25	1.37	113.65	71.33
20.	DCA-120	41.99	2.03	1.29	82.57	54.57
21.	DCA-121	56.32	2.68	1.49	144.07	84.42
22.	DCA-122	39.32	3.15	1.97	126.57	76.65
23.	DCA-123	40.32	2.93	1.35	113.46	54.68
24.	DCA-124	45.89	2.87	1.52	127.26	70.56
25.	DCA-125	55.99	3.97	1.72	216.97	96.41
26.	DCA-126	51.20	3.92	2.17	193.67	113.19
27.	DCA-127	54.32	2.90	1.80	152.06	97.70
28.	DCA-128	32.59	3.85	1.97	119.91	62.19
29.	DCA-129	44.30	4.83	2.63	216.12	119.83
30.	DCA-130	55.91	3.97	1.82	217.33	101.70
31.	DCA-131	64.93	4.13	1.85	253.31	120.34
32.	DCA-132	42.88	3.03	1.73	123.88	73.70
33.	DCA-133	45.99	2.32	1.55	102.73	71.37
34.	DCA-134	56.66	3.71	1.87	203.63	104.50
35.	DCA-135	38.17	3.07	1.72	108.26	65.23
36.	DCA-136	66.66	3.72	1.65	238.07	110.53
37.	DCA-137	32.11	2.97	1.72	93.00	54.62
	Mean	49.14	3.26	1.69	156.94	83.42
	S.E.±	1.61	0.18	0.06	3.56	1.90
	C.D. (P=0.05)	4.55	0.51	0.18	10.12	5.36
	CV (%)	5.70	9.72	0.73	3.96	3.95

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whereas the genotype DCA-113 recorded minimum (6.83) branches. Such variations in growth among different genotypes of chilli were reported by Abusaleha (1998), Usharani (1996) and Kanthaswamy *et al.* (2000).

Number of fruits per plant ranged from 32.11 to

66.66. More number of fruits per plant was recorded in DCA-136 (66.66) followed by DCA-101 (65.99) and DCA-104 (63.01). Minimum number of fruits per plant was recorded in DCA-137 (32.11). Significant differences were noticed among genotypes for matured ripe fruit

Table 3: Performance of chilli genotypes with respect to matured ripe chilli yield, dry chilli yield and ascorbic acid (mg/100 g)

Sr. No.	Genotype	Matured ripe chilli yield (q/ha)	Dry chilli yield (q/ha)	Ascorbic acid (mg/100 g)
1.	DCA-101	85.34	37.79	102.37
2.	DCA-102	66.58	30.08	89.84
3.	DCA-103	59.57	27.78	77.77
4.	DCA-104	77.30	35.66	105.56
5.	DCA-105	47.29	22.13	98.00
6.	DCA-106	57.75	24.00	97.61
7.	DCA-107	35.18	15.43	87.28
8.	DCA-108	37.37	20.24	103.17
9.	DCA-109	31.77	16.50	80.95
10.	DCA-110	34.17	19.58	96.82
11.	DCA-111	44.79	22.63	125.39
12.	DCA-112	44.38	25.44	87.27
13.	DCA-113	30.82	15.25	94.23
14.	DCA-114	41.34	24.84	103.96
15.	DCA-115	27.83	14.17	110.00
16.	DCA-116	44.52	24.12	124.59
17.	DCA-117	41.75	25.00	122.21
18.	DCA-118	46.88	27.04	104.75
19.	DCA-119	33.48	20.41	115.39
20.	DCA-120	24.29	12.44	111.90
21.	DCA-121	40.33	24.28	121.49
22.	DCA-122	38.50	21.98	114.95
23.	DCA-123	34.43	15.47	93.64
24.	DCA-124	38.31	19.98	93.33
25.	DCA-125	64.66	27.84	102.38
26.	DCA-126	57.65	32.84	109.37
27.	DCA-127	44.92	28.22	134.61
28.	DCA-128	35.23	18.00	109.52
29.	DCA-129	63.62	34.85	125.92
30.	DCA-130	64.59	29.40	99.20
31.	DCA-131	74.30	34.93	103.79
32.	DCA-132	37.63	22.40	113.50
33.	DCA-133	33.22	20.42	82.53
34.	DCA-134	61.48	30.63	78.81
35.	DCA-135	33.65	19.35	99.99
36.	DCA-136	68.65	32.02	102.37
37.	DCA-137	27.53	15.76	103.96
	Mean	46.79	24.09	103.40
	S.E.±	22.77	1.65	6.13
	C.D. (P=0.05)	7.81	4.66	17.30
	CV (%)	10.26	11.88	10.28

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weight. It ranged from 2.03 g to 4.83 g. Higher matured ripe weight (4.83 g) was recorded in genotype DCA-129 which was at par with DCA 101 (4.47), whereas lower matured weight (2.03 g) was recorded in DCA-120.

[Asian J. Hort., 3 (2) Dec. 2008]

Maximum dry fruit weight (2.63 g) was observed in DCA-129 followed by DCA-101 (1.97 g) and minimum dry fruit weight (1.29 g) was observed in DCA-120. Higher matured ripe chilli yield per plant (288.16 g) was recorded in DCA-101 followed by DCA-104 (254.99 g), DCA-131 (253.31 g), DCA-136 (238.07 g) and lower matured ripe chilli yield was recorded in DCA-120 (82.57 g). Higher dry chilli yield per plant (129.99 g) was recorded in DCA-101, which was at par with DCA-104 (122.81 g) and lower was recorded in DCA-120 (54.57 g).

Matured ripe chilli yield (q/ha) ranged from 24.29 to 85.34 quintals per hectare. Higher matured ripe chilli yield per hectare was recorded in DCA-101 followed by DCA-104 (77.30 q), DCA-131 (74.30 q), DCA-136 (68.65 q) and DCA-102 (66.58 q). The dry chilli yield varied from 12.44 q per ha to 37.79 quintals per hectare. There was significant variation in dry chilli yield among the genotypes DCA-101 recorded 37.79 q, which was at par with DCA-104 (35.66 q) and lower dry chilli yield was recorded in DCA-120 (12.44 q). The variation in the yields of different varieties grown under similar condition had been reported by several workers at different places (Natarajan *et al.*, 1988; Abusaleha, 1998 and Kanthaswamy *et al.*, 2000).

Ascorbic acid content of fruits ranged from 78.81 mg per 100 g (DCA-134) to 134.61 mg per 100 g (DCA-127). This may be attributed to genotypic variation. Similar results were obtained by Nawalagatti *et al.* (1999), Krishnakumar *et al.* (1999) and Kanthaswamy *et al.* (2000).

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