

Mean performance and genetic variability in chilli (*Capsicum annum* L.)

■ N. JABEEN, S. MUFTI, S.H. KHAN, K. HUSSAIN, TASADUK SHAFI AND SONAM SPALDON

SUMMARY

The present investigation was carried out at the experimental field of Division of Olericulture, SKUAST-K, Shalimar during *Kharif* 2009. The experimental material consisted of ten genotypes, raised in a plot size of 2.4 m x 1.8 m at a spacing of 45 x 30 cm in RBD design with three replications. Observations were recorded from ten randomly selected plants of each genotype in each replication on various characters *viz.*, plant height (cm), plant spread (cm), number of branches per plant, number of fruits per plant, fruit length (cm), fruit breadth (cm), number of seeds per fruit, average fruit weight (g), fruit yield per plant (g) and fruit yield (q/ha). Significant differences were observed for all the characters under observation. Maximum fruit yield per plant and per hectare were recorded by PC-2062 (674.90 g) and 307.36 q, respectively followed by LCA-206 (631.53 g and 292.36 q, respectively) and LCA-436 (628.77 g and 291.09 q, respectively) while minimum by Bydagi dabbi (314.57 g and 145.63 q, respectively). The value of genetic gain were high for all the characters under study, the heritability indicating predominance of additive gene effects for all the characters under study. Hence, it appears that selection for all the characters may result in the development of superior genotypes with maximum emphasis initially on fruit breadth with highest genetic gain (65.15) followed by fruit length (64.43), number of seeds per fruit (60.63), fruit yield per plant (59.35), fruit yield per hectare (58.97), number of branches per plant (58.73), number of fruits per plant (54.38), plant spread (42.67), plant height (35.50) and average fruit weight (16.47).

Key Words : Chilli, Performance, Genetic variability, Temperate conditions

How to cite this article : Jabeen, N., Mufti, S., Khan, S.H. Hussain, K., Shafi, Tasaduk and Spaldon, Sonam (2012). Mean performance and genetic variability in chilli (*Capsicum annum* L.). *Internat. J. Plant Sci.*, 7 (1) : 155-157.

Article chronicle : Received : 27.09.2011; Sent for revision : 15.10.2011; Accepted : 08.12.2011

Chilli (*Capsicum annum* L.) is one of the main solanaceous crop which is indispensable vegetable and spice crop grown for its green and red ripe fruits. Presently it is gaining more importance in the global market because of its value added products like chilli powder, oleoresin and colouring matter. It is a commercial spice of India as well as Kashmir. Chilli is mainly used in culinary adding flavour, colour, vitamin (A and C) and pungency due to capsaicin which is known to

be stimulant, attractive, rubefaciant, carminative and anticoagulant. Considering its importance, the present investigation was carried out under AICRP to know the mean performance and genetic variability and adaptability of crop under Kashmir conditions.

MATERIALS AND METHODS

The present investigation was carried out at the experimental field of Division of Olericulture, SKUAST-K, Shalimar during *Kharif* 2009. The experimental material consisted of ten genotypes, raised in a plot size of 2.4 m x 1.8 m at a spacing of 45cm x 30 cm in RBD design with three replications. All the recommended package of practices were followed for raising the crop. Observations were recorded from ten randomly selected plants of each genotype in each replication on various characters *viz.*, plant height (cm), plant

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spread (cm), number of branches per plant, number of fruits per plant, fruit length (cm), fruit breadth (cm), number of seeds per fruit, average fruit weight (g), fruit yield per plant (g) and fruit yield (q/ha).

RESULTS AND DISCUSSION

Significant differences were observed for all the characters under observation given in Table 1. Maximum plant height was recorded by LCA-436 (66.00 cm) followed by AKC-406 (64.67 cm) while least by CCH-05 (41.33 cm), maximum plant spread by CCH-05 (52.33 cm) followed by PC-2062 (50.33 cm), and BCC-1 (44.00 cm) while minimum by Bydagi dabbi (26.00 cm), maximum number of branches per plant by IVR-338 (15.67) followed by JCA-283 (14.00) and PC-2062 (11.33) while minimum by Bydagi dabbi (6.67), maximum number of fruits per plant by PC-2062 (81.67) followed by LCA-206 (69.67) and

JCA-283 (69.00) while minimum by Bydagi dabbi (37.00), maximum fruit length by ACS-06-02 (12.90) followed by AKC-406 (10.40) while minimum by CCH-05 (4.83), maximum fruit breadth by BCC-1 (1.13 cm) followed by Bydagi dabbi (1.10 cm) and ACS-06-02 (1.07 cm) while minimum by JCA-283 (0.70), maximum number of seeds per fruit by BCC-1 and AKC-406 each recording a value of 105.33 for the trait followed by Bydagi dabbi (91.67) while least by CCH-05 (34.67), maximum average fruit weight by AKC-406 (10.20) followed by LCA-436 (9.43) and BCC-1 (9.40) while least by IVR-338 (7.93), maximum fruit yield per plant and per hectare by PC-2062 (674.90 g) and 307.36 q, respectively followed by LCA-206 (631.53 g and 292.36 q, respectively) and LCA-436 (628.77 g and 291.09 q, respectively) while minimum by Bydagi dabbi (314.57 g and 145.63 q, respectively). Table 2 depicts the variability parameters of the crop studied. Wider range of mean values

Table 1: Mean performance of chilli (*Capsicum annum L.*) genotypes under Kashmir valley conditions

Genotypes	Plant height (cm)	Plant spread (cm)	No. of branches /plant	No. of fruits/ plant	Fruit length (cm)	Fruit breadth (cm)	No. of seeds/ fruit	Av. fruit weight (g)	Fruit yield/ Plant (g)	Fruit yield (q/ha)
LCA-206	53.67	39.00	9.33	69.67	8.33	0.97	67.00	9.07	631.53	292.36
IVR-338	54.00	38.33	15.67	46.33	9.83	0.73	61.67	7.93	367.47	170.12
JCA-283	50.00	41.00	14.00	69.00	7.93	0.70	62.33	8.51	586.53	271.53
CCH-05	41.33	52.33	7.67	40.67	4.83	0.80	34.67	7.96	324.13	150.06
LCA-436	66.00	38.00	11.00	66.67	7.93	1.03	71.67	9.43	628.77	291.09
ACS-06-02	46.33	33.33	10.00	40.33	12.90	1.07	62.67	8.90	359.03	166.25
PC-2062	61.67	50.33	11.33	81.67	9.83	0.87	58.67	8.13	674.90	307.36
BCC-I	46.33	44.00	8.33	62.00	9.73	1.13	105.33	9.40	582.60	269.72
AKC-406	64.67	32.00	8.67	61.00	10.40	1.03	105.33	10.20	621.87	287.89
Bydagi dabbi	43.00	26.00	6.67	37.00	10.33	1.10	91.67	8.50	314.57	145.63
C.D. (P=0.05)	1.44	1.32	1.43	2.91	0.91	0.22	5.14	0.32	21.33	9.17
CV (%)	1.62	2.00	8.54	2.95	5.41	12.80	4.22	2.13	2.44	2.27

Table 2 : Range, genotypic and phenotypic coefficients of variability, heritability and genetic gain in chilli (*Capsicum annum L.*)

Sr. No.	Characters	Grand mean	Range	PCV	GCV	h^2 (bs)	Genetic gain
	Plant height (cm)	25	41.33-66.00	17.38	17.31	99.12	35.50
1.	Plant spread (cm)	26	26.00-52.33	20.90	20.81	99.07	42.67
2.	No. of branches /plant	9	6.67-15.67	30.87	29.66	92.34	58.73
3.	No. of fruits/ plant	44	37.00-81.67	26.72	26.56	98.77	54.38
4.	Fruit length (cm)	8	4.83-12.90	32.19	31.73	97.16	64.43
5.	Fruit breadth (cm)	0.80	0.70-1.13	36.16	33.82	87.46	65.15
6.	No. of seeds/fruit	71	34.67-105.33	29.72	30.02	98.01	60.63
7.	Av. fruit weight (g)	3	7.93-10.20	8.23	8.26	93.72	16.47
8.	Fruit yield/plant (g)	359	314.57-674.90	29.02	28.91	99.29	59.35
9.	Fruit yield (q/ha)	162	145.63-307.36	28.80	28.71	99.37	58.97

were revealed for fruit yield per plant, fruit yield per hectare, number of seeds per plant, number of fruits per plant, plant spread and plant height while for rest of the characters the values were low. The phenotypic and genotypic coefficients of variation (PCV and GCV) were highest in fruit breadth (36.16 and 33.82, respectively) followed by fruit length (32.19 and 31.73, respectively), number of branches per plant (30.87 and 29.66, respectively), number of seeds per fruit (29.72 and 30.02, respectively), fruit yield per plant (29.02 and 28.91, respectively), fruit yield per hectare (28.80 and 28.71), number of fruits per plant (26.72 and 26.56, respectively), plant spread (20.90 and 20.81, respectively), plant height (17.38 and 17.31, respectively), indicating the corresponding degrees of variability for these traits. Parallelism between the magnitude of PCV and GCV estimates were observed for all the traits depicting relative stability to environmental fluctuations. Heritability (bs) was high for all the characters under study indicating large proportion of phenotypic variance attributed to the genotypic variance. The value of genetic gain were high for all the characters under study, the heritability indicating predominance of additive gene effects for all the

characters under study. Hence, it appears that selection for all the characters may result in the development of superior genotypes with maximum emphasis initially on fruit breadth with highest genetic gain (65.15) followed by fruit length (64.43), number of seeds per fruit (60.63), fruit yield per plant (59.35), fruit yield per hectare (58.97), number of branches per plant (58.73), number of fruits per plant (54.38), plant spread (42.67), plant height (35.50) and average fruit weight (16.47). The results are in conformity to those of Shirsat (1994) and Varalashmi and Haribabu (1991).

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