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Mean performance analysis for various traits in Okra [*Abelmoschus esculantus* (L.) Moench]

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Abstract
The field experiment was conducted at Vegetable Research Farm, Department of Horticulture, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi during the summer and rainy season of 2018. Comprising of 18 genotypes in lines × design fashion in which 18 parents along with 45 F1 hybrids was accessed for yield attributing triats *viz.:* days to 50% flowering, plant height, number of primary branches per plant, node at which first flower appears, internodal length, number of nodes per plant, number of fruits per plant, fruit yield per plant, fruit yield (q/ha), fruit length, fruit diameter, average fruit weight, number of seeds per fruit, seed weight per fruit, seed yield per plant, seed yield, days to edible fruit maturity, seed index. The study showed a range of improvement in hybrids as compared to its parent. The cross-combination Kashi Pragati × Hisar Unnat and Pusa A-4 × Hisar Unnat showed better results in yield per hectare.

Keywords: Okra, mean performance, yield

Introduction
Okra is well-known in many parts of the world for its favour, and it has a wide range of culinary applications. The immature, fresh, green seed pods are consumed as a vegetable, while the extract from the harvested fruit is used to thicken soups, broth, and sauces, as well as in various recipes to improve their consistency (Bemiller *et al.,* 1993 and Sengkhamparn *et al.,* 2010) [1, 7]. In South India, where the winters are warm and frost-free, okra may be cultivated all year. Okra thrives in warm-moist weather seasons and grows well on plains and hills. It is a seasonal vegetable crop grown in northern India throughout the spring, summer, and rainy seasons. Its rapid development, short duration, and photo-insensitive behaviour enable geneticists and plant breeders to produce crops in less than a year, such as spring-summer crops and rainy season crops, and to reduce genetic advancement timeframes (Gondane, 1989) [2]. The per unit area of agricultural output is decreasing day by day as the global scenario changes, which eventually affects crop production. Various agronomic advances have been made, yet the gap still exists. It is feasible to generate new plant kinds from current populations by incorporating novel breeding procedures. The main issues in okra are a high yielding variety with good quality output and a low incidence of pests and illnesses. As a result, the hybridization programme is beneficial in this sector of employment. The genetic richness of okra is high, and the relevance of genetic resources in extending the genetic basis of farmed okra and in okra breeding programmes has long been highlighted. (Mohapatra *et al.*, 2007; Reddy, 2010) [4, 6].

Material and Method
The present study was carried out at Vegetable Research Farm, Department of Horticulture, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi during the summer and rainy season of 2018. The experimental work comprised of 18 genotypes developed from several organization and received from the ICAR - Indian Institute of Vegetable Research, Varanasi. The parents were chosen randomly and demonstrate a wide variety of yield differences and numerous yield characteristics. Among 18 genotypes, 15 genotypes were treated as lines and 3 genotypes was considered as testers. The genotypes were placed in line × tester mating design in randomized block design. The genotypes used as lines: Pusa Makhmali, Kashi Leela, Pusa Sawani, Kashi Satdhari, P7, Pusa A-4, EC169419, IC- 117245, Kashi Pragati, EC-169408, Kashi Vibhuti, EC-169459, EC-112231, EC-169417, IC-117216, genotypes used as testers: Varsha Uphar, Punjab Padmini, Hisar Unnat. During first season (summer 2018) all fifteen lines along with three testers will be sown.

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The crossing will be done in Line × Tester fashion to produce 45 F1s and individual plant of parents will be selfed to maintain pure seed. In the second season (rainy 2018) all F1s (45) along with parents will be sown. Data will be recorded for parents and F1 as per yield and yield traits. Data was recorded on the following quantitative traits are: Days to 50% flowering, Plant height (cm), Number of primary branches per plant, Node at which first flower appears, Internodal length (cm), Number of nodes per plant, Number of fruits per plant, Fruit yield per plant (g), Fruit yield (q/ha), Fruit length (cm), Fruit diameter (cm), Average fruit weight (g), Number of seeds per fruit, Seed weight per fruit (g), Seed yield per plant (g), Seed yield (q/ha), Days to edible fruit maturity, Seed index (g). The statistical analysis for experimental design was given by Panes and Sukhatme (1967) [5] and the analysis of variance for testing the variation among progenies and parents was given by Singh and Chaudhary (1977) [9].

Result and Discussion
The research conducted in above mentioned field gives the following results. The estimates of mean performance is presented in Table 1. The analysis of variance, the mean sum of squares due to parents and hybrids were highly significant for all the characters under the study. The mean performance for days to 50% flowering was 45.33 days for parents and 44.51 days for F1 hybrid Among the parents, Pusa Makhmali (34.33 days) gave early flowering followed by Kashi Leela (34.67 days) while late flowering was showed in EC-169459 (51.00 days). In case of hybrids cross combination Pusa Makhmali × Varsha Uphar (32.00 days) found early flowering followed by Kashi Leela × Punjab Padmini (32.67 days) while IC-117245 × Punjab Padmini (52.67 days) exhibited late flowering.

In plant height it was 101.30 cm and 102.15 cm for parents and F1 hybrid, respectively. The maximum height was recorded in genotype Kashi Pragati (126.52 cm) followed by Punjab Padmini (125.23 cm) whereas minimum was found in EC-169417 (81.68 cm) for parent. Among the hybrids, maximum value was observed in cross combination Kashi Pragati × Punjab Padmini (133.82 cm) followed by Kashi Satdhari × Punjab Padmini (131.98 cm) while least value was exhibited in EC-112231 × Varsha Uphar (76.12 cm) and EC-112231 × Hisar Unnat (79.43 cm).

For number of primary branches, the mean value was 2.49 for parent and 2.79 for F1 hybrid. Maximum value for this trait was recorded in parent Hisar Unnar (4.00) followed by Varsha Uphar (3.57) whereas minimum value was noted in EC-112231 (1.60) for parent. Out of 45 crosses, highest value for this trait was observed in cross combination EC-169459 x Varsha Uphar (3.80) followed by Pusa A-4 × Hisar Unnat (3.47) while minimum value for same trait was showed in EC-169419 × Punjab Padmini (1.40).In the trait node at which 1st flower appears, the mean value was 9.82 and 8.92 for parents and F1 hybrid respectively. The lowest value was observed in parent Kashi Vibhuti (5.73) followed by Kashi Leela (7.73) and highest value was registered in EC-112231 (12.30). Whereas among the crosses, EC-169459 × Varsha Uphar (7.33) exhibited early node to first flower appear followed by Kashi Vibhuti × Varsha Uphar (7.44) However, highest value was recorded in cross combination IC-117216 × Hisar Unnat (12.67).

For internodal length mean value recorded for parent was 4.61 cm and for F1 hybrid was 4.52 cm. It was recorded that in parent minimum internodal length was observed in Kashi

Vibhuti (3.03) followed by EC-169417 (3.68) whereas maximum value was observed in Kashi Pragati (7.03). Considering all cross combinations, EC-169417 × Punjab Padmini (2.46) showed minimum internodal length followed by Kashi Vibhuti × Hisar Unnat (2.81). While, maximum value was reported in EC-169419 × Varsha Uphar (6.17) for this trait.

While number of nodes per plant showed mean value of 17.69 for parent and 18.25 for F1 hybrid. High value for number of nodes per plant was recorded in parent Varsha Uphar (21.20) followed by Punjab Padmini (20.80) while least value was observed in Pusa Makhmali (15.27). Among hybrids, cross combination IC-117216 x Punjab Padmini (25.40) depicted maximum number of nodes per plant proceeded by Kashi Vibhuti × Punjab Padmini (24.40) whereas EC- 169419 × Varsha Uphar (12.27) showed least value for this trait. The mean value of parent was 13.88 and for F1 hybrid was 15.10 in number of fruits per plant. Among the parents the Varsha Uphar (19.47) gave highest number of fruits per plant followed by Punjab Padmini (18.73) whereas EC-169408 (11.40) registered lowest value. In case of hybrids cross combination Kashi Pragati × Hisar Unnat (20.27) showed high number of fruits per plant followed by EC-169459 × Varsha Uphar (19.97) while EC-169417 × Hisar Unnat (9.73) showed least number of fruits per plant flowering.

Fruit yield per plant had a mean value of 165.60 g for parent and 182.44 g for F1 hybrid. The maximum fruit yield per plant was found in parent Punjab Padmini (244.90 g) followed by Varsha Uphar (229.92 g) and minimum in EC-112231 (105.18) for parent. Among the hybrids, maximum value was observed in cross combination Kashi Pragati × Hisar Unnat (239.25 g) followed by Pusa A-4 × Hisar Unnat (238.12 g) while least value was observed in EC-169419 × Punjab Padmini (110.78 g). In fruit yield (q/ha) mean value for parent was 44.71 q/ha and for F1 hybrid 49.26 q/ha. Maximum value for this trait was recorded in parent Punjab Padmini (66.12 q/ha) followed by Varsha Uphar (62.08 q/ha) whereas minimum value was recorded in EC- 112231 (28.40 q/ha) for parent. Out of 45 crosses, highest value was noted in cross combination Kashi Pragati × Hisar Unnat (64.60 q/ha) followed by Pusa A-4 × Hisar Unnat (64.29 q/ha). Minimum value for same trait was observed in EC-169459 × Hisar Unnat (31.11 q/ha) and EC- 169459 × Punjab Padmini (29.91 q/ha).

In case of fruit length mean value was 11.18 cm and 11.99 cm for parent and F1 hybrid, respectively. The highest value was observed in parent Varsha Uphar (15.47) followed by Punjab Padmini (14.88 cm) while the lowest value was exhibited in EC- 169419 (7.56 cm). Whereas among the crosses, IC-117216 × Varsha Uphar (16.16 cm) registered highest value followed by IC-117216 × Punjab Padmini (15.58 cm). The lowest value was found in cross combination EC- 169419 × Hisar Unnat (5.61 cm). For fruit diameter the mean value of parent was 1.73 cm and F1 hybrid. Among parent maximum fruit diameter was observed in parent Varsha Uphar and Hisar Unnat (2.59 cm each) whereas the minimum value was noted in Pusa A-4 (1.30 cm). Considering all cross combinations, IC-117216 × Varsha Uphar (2.67 cm) showed maximum fruit diameter followed by P7 × Hisar Unnat (2.66 cm). While, minimum value was reported in Pusa A-4 × Punjab Padmini (1.08 cm).

Considering average fruit weight, the parent had mean value of 11.95 g and F1 hybrid was 12.99 g. High value for average fruit weight was recorded in parent Pusa A-4 (13.70 g)

followed by EC-169417 (13.61 g) while lowest value was exhibited in EC-112231 (8.68 g). Among hybrids cross combination EC-169417 × Hisar Unnat (21.54 g) recorded maximum average fruit weight followed by in Pusa Makhmali × Varsha Uphar (20.11 g) whereas EC-169459 × Varsha Uphar (6.32 g) showed least value for this trait. The mean performance for number of seeds per fruit was 45.74 for parents and 50.63 for F1 hybrids. Among the parents, Varsha Uphar (65.13) gave highest number of seeds per fruit followed by Hisar Unnat (55.80) whereas least value showed in EC-169408 (39.90). In case of hybrids, cross combination Kashi Satdhari × Punjab Padmini (70.40) found highest number of seeds per fruit followed by Kashi Satdhari × Hisar Unnat (64.27) while Pusa A-4 × Hisar Unnat (31.93) showed least number of seeds per fruit.

For seed weight per fruit had mean value of 3.90 g for parents and 4.21 g for F1 hybrid. The maximum seed weight per fruit was recorded in parent Punjab Padmini (4.60 g) followed by Hisar Unnat (4.50 g) and minimum in P7 (3.38 g) for parent. Among the hybrids, maximum value was observed in cross combination EC-169417 × Punjab Padmini (5.67 g) followed by Pusa Sawani × Hisar Unnat (5.63 g) while least value was depicted in Kashi Satdhari × Varsha Uphar (3.13) and Kashi Vibhuti × Punjab Padmini (3.06). In the trait seed yield per plant mean value was 54.60 g and 62.83 g for parents and F1 hybrid respectively. The maximum seed yield per plant was recorded in parent Punjab Padmini (85.99 g) followed by Varsha Uphar (83.41 g) and minimum found in EC-169408 (40.20 g) for parent. Among the hybrids, maximum value was noted in cross combination EC-169459 × Punjab Padmini (87.33 g) followed by Kashi Leela × Hisar Unnat (86.87 g)

while least value was observed in EC-619408 × Varsha Uphar (33.82 g).

The seed yield q/ha the mean value for parent was 14.74 q/ha and for F1 hybrid 16.96 q/ha. The maximum seed yield per plant was recorded in Punjab Padmini (23.21 q/ha) followed Varsha Uphar (22.52 q/ha) and least EC-169408 (10.86 q/ha) for parent. Among the hybrids, maximum value was exhibited in cross combination EC-169459 × Punjab Padmini (23.58 q/ha) followed by Kashi Leela × Hisar Unnat (23.45 q/ha) while least value was observed in EC- 619408 × Varsha Uphar (9.13 q/ha). In case of days to edible maturity had mean value of 55.85 days for parent and 50.46 days for F1 hybrid. Among the parents Pusa Makhmali (46.67 days) gave early fruit maturity followed by Kashi Leela (48.60 days) as far as late maturity is concerned it was observed in Punjab Padmini (64.20 days). In case of hybrids, cross combination Pusa Makhmali × Punjab Padmini (40.67 days) showed early fruit maturity followed by Pusa Makhmali × Varsha Uphar (42.07 days) while IC-112231 × Punjab Padmini (61.60 days) showed late fruit maturity.

The mean performance for seed index was 4.87 g for parents and 5.49 g for F1 hybrid. The maximum seed index was recorded in Hisar Unnat (7.40 g) followed by Punjab Padmini (6.60 g) while minimum in Kashi Satdhari (2.71) for parent. Among the hybrids, maximum value was observed in cross combination EC-112231 x Varsha Uphar (7.93 g) followed by EC-112231 × Hisar Unnat (7.49 g) while least value was observed in Pusa Makhmali × Punjab Padmini (2.83 g) and Kashi Satdhari × Varsha Uphar (2.38 g). All the finding are in parity with Singh *et al.* (2007) [8]; Vani *et al.* (2015) [11]; Kumar *et al.* (2019) [3] and Vani *et al.* (2021) [10].

Table 1: Mean performance of okra genotypes and their hybrids

Genotype	D50F	PH	NPB	N1FA	IL	NNPP	NFPP	FYPP	FY	FL	FD	AFW	NSPF	SWPF	SYPP	SY	DEFM	SI
Varsha Uphar	44.33	110.81	3.53	8.8	4.03	21.2	19.47	229.92	62.08	15.47	2.59	11.82	65.13	4.27	83.41	22.52	59	5.83
Punjab Padmini	48.67	125.23	3.47	9.6	4.84	20.8	18.73	244.9	66.12	14.88	2.4	13.13	52.27	4.6	85.99	23.21	64.2	6.6
Hisar Unnat	45	101.35	4	8.87	3.75	20.53	17.8	218.59	59.02	14.34	2.59	12.37	55.8	4.5	80.25	21.67	58.6	7.4
Pusa Makhmali	34.33	91.17	2.2	9.93	4.79	15.27	13.6	178.93	48.31	8.63	1.58	13.17	44.6	3.61	49.04	13.24	46.67	3.19
Kashi Leela	34.67	121.25	3	7.73	5.88	17.2	13.87	147.91	39.94	10.51	1.61	10.72	42.87	3.62	50.14	13.54	48.6	4.34
Pusa Sawani	49.67	113.09	2.67	10.73	5.03	18.27	14.47	165.12	44.58	8.41	1.58	11.42	50.47	4.06	58.61	15.82	56.87	3.5
Kashi Satdhari	48.67	124.29	2.47	8.53	6.15	17	12.53	133.1	35.94	8.84	1.56	10.64	40.27	3.44	43.23	11.67	57.4	2.71
P7	41.33	94.8	2.27	10.73	3.84	18.93	12.8	156.06	42.14	7.74	1.47	12.29	43.47	3.38	43.28	11.69	51.53	4.41
Pusa A-4	47.67	97.56	2.67	11.33	4.84	16.33	12.93	176.07	47.54	8.32	1.3	13.7	42.33	4.11	53.41	14.42	57.13	4.36
EC-169419	51	91.7	1.53	9.2	4.76	15.53	11.53	134.55	36.33	7.56	1.58	11.7	40.6	3.9	45.03	12.16	63.4	4.82
IC-117245	47.33	95.4	2.2	10.27	5.02	15.33	12.4	149.55	40.38	8.89	1.69	12.07	48.27	3.78	47.12	12.72	52.2	5.2
Kashi Pragati	48.33	126.52	1.8	7.87	7.03	15.6	13.73	181.85	49.1	9.47	1.53	13.29	41.27	4.03	55.41	14.96	58.07	4.37
EC-169408	47.67	93.21	2.6	11.73	4.37	16.87	11.4	130.4	35.21	12.87	1.57	11.46	39.9	3.52	40.2	10.86	50.67	5.47
Kashi Vibhuti	45.33	86.78	2.07	5.73	3.03	20.53	13.13	161.4	43.58	13.62	1.91	12.29	45.57	3.54	46.46	12.54	54	4.33
EC-169459	42.33	90.85	2.8	10.8	4.09	17.27	11.53	147.65	39.87	12.53	1.35	12.82	43.07	3.86	44.55	12.03	55.73	5.15
EC-112231	47	85.03	1.6	12.3	3.85	16.93	12.13	105.18	28.4	10.98	1.32	8.68	43.87	4.09	49.72	13.42	56.6	6.26
EC-169417	48	81.68	2.2	10.73	3.68	16.87	12.33	167.33	45.18	13.87	1.82	13.61	40.7	4.44	54.93	14.83	59.53	5.33
IC-117216	44.67	92.59	1.67	11.9	3.97	18	15.4	152.23	41.1	14.24	1.7	9.88	42.97	3.38	52.08	14.06	55.13	4.35
Pusa Makhmali × Varsha Uphar	32	95.45	3.4	7.6	3.87	19.27	11.47	229.91	62.08	12.21	2.28	20.11	51.8	4.24	48.63	13.13	42.07	4.4
Pusa Makhmali × Punjab Padmini	34	98.03	3	8.67	4.49	17.73	12.13	222.69	60.13	11.17	2.23	18.6	55.67	4.46	54.21	14.64	40.67	2.83
Pusa Makhmali × Hisar Unnat	33	93.38	3.2	7.93	3.74	19.33	10.6	211.56	57.12	14.81	2.38	20.04	57.27	3.54	37.55	10.14	50.73	3.47
Kashi Leela × Varsha Uphar	33.33	124.05	2.4	8.67	4.46	17.6	17.07	129.84	35.06	9.69	1.25	7.69	55.4	4.47	76.39	20.62	49.4	6.35
Kashi Leela × Punjab Padmini	32.67	128.11	2.67	9.8	5.72	18.6	15.53	137	36.99	9.75	1.18	8.83	51.2	3.24	50.28	13.58	52	5.46
Kashi Leela × Hisar Unnat	37.67	125.87	2.27	9.2	5.04	20.6	19.6	128.55	34.71	8.81	1.56	6.6	53.53	4.43	86.87	23.45	45.6	6.13
Pusa Sawani x Varsha Uphar	47	119.29	3.4	8.67	4.51	21.33	12.47	212.98	57.5	10.53	2.26	17.2	45.87	5.15	64.15	17.32	50.13	4.41
Pusa Sawani × Punjab Padmini	45	121.75	3	9.87	4.96	20.2	11.53	227.07	61.31	11.55	1.28	19.79	41.53	5.41	62.4	16.85	58.67	3.12
Pusa Sawani × Hisar Unnat	46	116.39	3.2	8.13	4.16	22.2	12.13	212.73	57.44	10.06	1.12	17.6	50.6	5.63	68.21	18.42	49	5.35
Kashi Satdhari × Varsha Uphar	45.67	128.75	2.33	8.87	5.98	18.2	17.27	180.83	48.82	10.59	2.6	10.56	34.27	3.13	53.94	14.56	43.53	2.38
Kashi Satdhari × Punjab Padmini	46.67	131.98	2.6	10.07	6.12	18.33	18.13	175.09	47.28	12.32	2.49	9.69	70.4	4.01	72.8	19.65	50.4	5.45
Kashi Satdhari × Hisar Unnat	43.67	126.13	2.2	8.73	5.53	19.07	16	169.68	45.81	11.02	2.27	10.64	64.27	4.24	67.77	18.3	50.4	4.43
P7 × Varsha Uphar	45.67	92.85	3.4	8.13	4.59	16.4	18.13	145.41	39.26	7.51	2.34	8.08	54.8	3.83	69.38	18.73	52.87	5.32
P7 × Punjab Padmini	42.33	88.84	3.13	9.73	4	17.47	18.4	135.37	36.55	7.1	2.48	7.4	52.27	4.13	76.07	20.54	46.6	6.45
P7 × Hisar Unnat	46	90.24	3.2	8.73	4.44	16.33	17.6	140.31	37.88	7.05	2.66	8	53	3.95	69.31	18.71	55.4	4.94
Pusa A-4 × Varsha Uphar	42.67	103.32	3.33	7.87	4.21	19.47	17.2	230.78	62.31	11.45	1.22	13.44	37.4	3.89	66.8	18.03	47.87	3.94

Cross	D50F	PH	NPB	N1FA	IL	NNPP	NFPP	FYPP	FY	FL	FD	AFW	NSPF	SWPF	SYPP	SY	DEFM	SI
Pusa A-4 × Punjab Padmini	46.67	108	3.2	9.87	4.09	20.87	15.73	229.73	62.03	10.51	1.08	14.64	35.07	4.57	72.06	19.46	50.47	4.74
Pusa A-4 × Hisar Unnat	45	100.92	3.47	8.93	4.16	19.4	16.67	238.12	64.29	12.18	1.19	14.33	31.93	4.13	68.88	18.6	52.73	5.39
EC - 169419 × Varsha Uphar	48.67	88.78	1.6	8.6	6.17	12.27	15	120.02	32.41	6.65	2.03	8	53.4	3.95	59.21	15.99	53.87	6.38
EC - 169419 × Punjab Padmini	47.67	82.63	1.4	9.27	5.15	13.27	15.13	110.78	29.91	6.76	2	7.33	51.47	3.81	57.74	15.59	54.2	5.21
EC - 169419 × Hisar Unnat	49.67	86.82	1.8	8.13	4.96	14.4	16.33	115.85	31.28	5.61	2.14	7.12	48.73	4.06	66.2	17.87	47.8	5.58
IC - 117245 × Varsha Uphar	50	107.1	3.2	8.2	4.26	20.07	11.47	191.37	51.67	12.16	2.65	16.77	63.6	3.83	43.97	11.87	47.67	4.44
IC - 117245 × Punjab Padmini	52.67	111.83	3.27	9.13	4.73	18.4	10.33	182.8	49.36	13.49	2.53	17.77	44.2	3.97	41.1	11.1	61.13	5.73
IC - 117245 x Hisar Unnat	49.67	100.84	3.2	8.87	4.89	16.47	10.47	201.33	54.36	11.98	1.96	19.4	55.53	4.12	43.02	11.62	58.4	6.49
Kashi Pragati × Varsha Uphar	46.33	129.37	1.47	8.87	6	18.27	17.33	230.63	62.27	14.66	1.94	13.39	45.53	3.63	63.13	17.04	49.93	5.41
Kashi Pragati × Punjab Padmini	45.67	133.82	1.67	9.87	5.24	21.2	18.2	236.98	63.98	13.85	2.35	13	54.53	4.07	73.79	19.92	54.27	6.26
Kashi Pragati × Hisar Unnat	43.33	131.14	1.6	8.33	6.09	18.33	20.27	239.25	64.6	13.93	1.93	11.79	38.07	3.88	78.77	21.27	51.87	5.38
EC- 169408 × Varsha Uphar	43.33	88.54	2.8	7.87	5.52	13.4	10.4	192.37	51.94	15.01	1.84	18.52	49.73	3.25	33.82	9.13	53.07	4.6
EC- 169408 × Punjab Padmini	45.67	91.86	3	9.73	5.21	14.6	9.87	185.4	50.06	14.33	2.1	19.07	47.4	4.55	44.87	12.12	51	6.39
EC -169408 x Hisar Unnat	44.33	86.06	3	8.4	5.44	13.27	10.53	197.39	53.3	14.74	2.41	18.66	53.13	4.7	49.41	13.34	48.6	7.26
Kashi Vibhuti × Varsha Uphar	50.33	91.9	3.4	7.4	2.95	21.4	15.33	210.11	56.73	15.39	1.32	13.62	41.07	4.82	74.06	20	55.5	7.02
Kashi Vibhuti × Punjab Padmini	48.33	96.08	3	9.07	2.84	24.4	16.33	215.92	58.3	14.08	1.77	13.19	43.93	3.06	50.05	13.51	58.03	5.41
Kashi Vibhuti × Hisar Unnat	47	92.78	3.2	6.93	2.81	23.8	15.33	209	56.43	15.27	1.54	13.6	55.93	4.84	74.28	20.06	47.53	6.84
EC - 169459 × Varsha Uphar	38	86.09	3.8	7.33	4.51	15.4	19.97	124.72	33.68	10.46	2.49	6.32	60	4.31	85.87	23.18	48.07	6.4
EC - 169459 × Punjab Padmini	39.67	88.08	3.27	8.13	5.15	14.17	18.73	120.26	32.47	11.12	2.28	6.4	54.27	4.66	87.33	23.58	46.13	5.41
EC - 169459 × Hisar Unnat	41.33	83.61	3.4	8.2	5.19	13.33	16.53	115.22	31.11	10.55	2.06	7.01	54.4	4.49	74.11	20.01	46.67	6.87
EC - 112231 × Varsha Uphar	48.33	76.12	3.13	9.87	4.49	15.53	16.73	160.98	43.46	14.67	2.57	9.66	57.93	4.33	72.7	19.63	49.73	7.93
EC - 112231 × Punjab Padmini	51	82.74	2.8	10.73	5.17	13.67	15.67	174.54	47.13	13.15	2.35	11.03	51.2	3.76	58.98	15.92	61.6	7.06
EC - 112231 × Hisar Unnat	49.33	79.43	3.2	8.27	4.38	14.53	15.27	169.46	45.75	12.44	1.86	11.02	53.87	4.76	72.71	19.63	57.73	7.49
EC - 169417 × Varsha Uphar	52	87.92	2	8.2	3.01	17.47	11.07	193.61	52.27	14.43	1.63	17.27	46.47	5.32	58.96	15.92	46.67	6.46
EC - 169417 × Punjab Padmini	51.33	94.06	1.8	8.87	2.46	18.07	10.2	205.8	55.56	15.21	1.41	20.57	49.67	5.67	57.67	15.57	50.13	5.15
EC - 169417 × Hisar Unnat	49.33	91	2.4	7.53	2.86	21.93	9.73	210.25	56.77	14.83	1.44	21.54	56.13	4.29	41.73	11.26	48	6.4
IC - 117216 × Varsha Uphar	41.67	104.38	2.93	11.13	3.37	23.4	19.07	180.25	48.67	16.16	2.67	9.52	58.87	3.29	62.66	16.92	43.53	5.19
IC - 117216 × Punjab Padmini	43	109.57	2.87	12.2	3.22	25.4	17.27	182.6	49.3	15.58	1.93	10.54	47.07	3.86	66.51	17.96	45.67	4.93
IC - 117216 × Hisar Unnat	40.33	100.72	3	12.67	3.42	22.33	19.2	175.17	47.3	14.77	2.62	9.22	45.87	3.58	68.8	18.58	45.2	4.78
Parent Mean	45.33	101.3	2.49	9.82	4.61	17.69	13.88	165.6	44.71	11.18	1.73	11.95	45.74	3.9	54.6	14.74	55.85	4.87
F1 Mean	44.51	102.15	2.79	8.92	4.52	18.25	15.1	182.44	49.26	11.99	1.99	12.99	50.63	4.21	62.83	16.96	50.46	5.49
Standard Error (SE)	0.92	1.21	0.13	0.29	0.27	0.8	0.75	10.76	2.91	0.63	0.15	0.83	1.29	0.11	3.68	0.99	1.09	0.13
CD5%	2.58	3.39	0.37	0.8	0.77	2.25	2.11	30.12	8.13	1.75	0.43	2.33	3.61	0.3	10.29	2.78	3.04	0.36
CV	3.56	2.06	8.51	5.44	10.45	7.68	8.84	10.47	10.47	9.2	14.04	11.35	4.54	4.53	10.53	10.53	3.61	4.21

D50F: Days to 50% flowering; PH: Plant height (cm); NPB: Number of primary branches per plant; N1FA: Node at which 1st flower appears; IL: Internodal length (cm); NNPP: Number of nodes per plant; NFPP: Number of fruits per plant; FYPP: Fruit yield per plant (g); FY: Fruit yield (q/ha); FL: Fruit length (cm); FD: Fruit diameter (cm); AFW: Average fruit weight (g); NSPF: Number of seeds per fruit; SWPF: Seed weight per fruit (g); SYPP: Seed yield per plant (g); SY: Seed yield (q/ha); DEFM: Days to edible maturity; SI: Seed index (g)

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