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Varietal evaluation of chilli (*Capsicum annuum*) for growth, yield and quality in Prayagraj Agro climatic condition

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Abstract
The present experiment was planned and executed in the Department of Horticulture during kharif season of 2019-2020 entitled "Varietal evaluation of Chilli (*Capsicum annuum*) for growth, yield and quality in Prayagraj Agro climatic condition". The experiment comprised of 15 genotypes the experiment was replicated three times under Randomized Block Design. The 15th varieties in observation were Mircha - 444, G-4, SPL-AS, Sun hot, F1 Hybrid, Seirra hybrid, Hybrid tej, KSP-1251, Local Varanasi, Farmer Karnataka 1st, Farmer Karnataka 2nd, F. Andhra Pradesh 1st, F. Andhra Pradesh 2nd, F. Andhra Pradesh 3rd and Local Kisan variety. Fifteen varieties were used to study the varietal evaluation for growth, yield and quality characters in chilli at fourteen different characters *viz*. plant height (cm), number of branches plant^{-1}, days to first flower initiation, days to 50% flowering, number of fruit plant^{-1}, length of fruit (cm), fruit diameter (cm), weight of fruit (g), number of seeds fruit^{-1} fruit yield plot^{-1}, fruit yield (t ha^{-1}), total soluble solid (^{0}brix) and ascorbic acid (mg/ 100g) were taken into consideration parameter studied, The result revealed that the genotype in terms of V_5:F1 Hybrid is highest growth, yield and quality of chilli.

Keywords: Growth, yield, quality, varieties and chilli

Introduction
Chilli (*Capsicum annuum* L.) belongs to family Solanaceae, which is emerging as one of the commercial vegetable crops at the global level, and is probably most important vegetable after Tomato. Chilli finds its place in spice as well as condiments. Chilli fruits are rich sources of vitamin C, vitamin A and E (Singh, 2004). Pungency of chilli is due to a crystalline acrid volatile alkaloid called capsaicin, present in the placenta of fruit. It is also a good source of chilli oleoresin, which is the total flavour extract of dried and ground chillies. The natural colour extracts of chilli are also finding their increased value in place of artificial colours in the food items (Katheek *et al.*, 2018) [3, 4]. Chilli belongs to the family solanaceae, are native to tropical South America (Sharma *et al.*, 2017) [10]. India is a major producer, exporter and consumer of chilli. In India, it is grown throughout the country but principal chilli growing states are Andhra Pradesh, Maharashtra, Karnataka, Tamil Nadu, Orissa, Madhya Pradesh, Rajasthan, West Bengal and Uttar Pradesh. Andhra Pradesh, Maharashtra, Karnataka and Tamil Nadu constitute 75% of the total area of its cultivation and production. In Uttar Pradesh chillies are mostly grown in eastern, eastern districts *viz*., Ballia, Azamgarh, Mirzapur, Basti, & Faizabad (Katheek *et al.*, 2018) [3, 4]. There is need to select the variety which shows tolerance or resistant to leaf curl disease (Kumar *et al.*, 2016) [7]. Wild and semi-domesticated relatives of cultivated species for exploitation in breeding programmes (Sharma and Ortiz, 2002) [10]. The most vital production constrains in chilli attacked by several insect and non-insect pests where, thrips, *Scirtothrips dorsalis* Hood, yellow mite, *Polyphagotarsonemus latus* (Bank) and fruit borer complex, *Helicoverpa armigera* (Hubner) and *Spodoptera litura* Fab. (Kavitha *et al.*, 2006) [5]. The main functional properties of chilli are pungency, antioxidant activity, vitamin C and natural pigments (Staryth and Nosova, 1982). Green chillies are rich source of Vitamin A and Vitamin E. It is widely used in the curry powder, curry paste, all kinds of pickles and preparing sauce, soups, etc. The quality of dried chilli is assessed by a number of different parameters such as colour, hotness, ascorbic acid content and volatile flavour compounds (Henderson, 1992; Ruth *et al.*, 2003; Jiang and Kubota, 2004; Kim *et al.*, 2006; Wang, *et al.*, 2009; Yaldiz *et al.*, 2010) [1, 9, 2, 6, 11, 12].

Materials and Methods

The present investigation "Varietal evaluation of Chilli (*Capsicum annuum*) for growth, yield and quality" during the *kharif* season of the year, 2018-2019. The details of materials used and methodology adopted during the course of study are mentioned. The experiment was carried out at the Horticulture Research Farm, Department of Horticulture, Sam Higginbottom University of Agriculture, Science and Technology, Prayagraj (U.P.). Prayagraj is situated at an elevation of 78 meters above sea level at 25.87^{0}N latitude and 81.15^{0}E longitude. This region has a sub-tropical climate prevailing in the south-east part of U.P. with both the extremes in temperature, i.e. the winter and the summer. In cold winters, the temperature sometimes goes as low as 32^{0}F in December – January and very hot summer with temperature reaching unto 115^{0}F in the months May and June. Raised bed above prepared for growing the seedling of all the 15 genotypes. Bed was raised 15cm above than ground level and 25-30 cm thus formed around, was used for irrigation and drainage. The size of bed was 1.0 m width and length was 20.0 m for sowing seed. The bed was prepared on 25th October 2019. The experiment was laid out in Randomized Block Design (RBD) with 15 treatment and three replications. Each genotypes was raised in 2mx2m plot size with spacing of 60x45cm accommodating 10 plant per plot. The crop was grown with standard package of practices. Five competitive plant were selected at random for record the observation on 14 characters *viz*., Plant height (cm), Number of branches plant^{-1}, Days to first flower initiation, Days to 50% flowering, Number of fruit plant^{-1}, Length of fruit (cm), Fruit diameter (cm), Weight of fruit (g), Number of seeds fruit^{-1}, Fruit plant^{-1} (kg), Fruit yield plot^{-1}, Fruit yield (t ha^{-1}), Total soluble solid (^{0}Brix) and Ascorbic acid (mg/ 100g) of fruit juice. Analysis of variance was carried out as per the procedure give by Panse and Shukhatme (1985) [8].

Results and Discussion

The statistically analyzed data are presented in Table 1. and graphically shown. The results showed that all the varieties tried in this experiment produced considerable amount of changes in Plant height (cm), Number of branches plant^{-1}, Days to first flower initiation, Days to 50% flowering, Number of fruit plant^{-1}, Length of fruit (cm), Fruit diameter (cm), Weight of fruit (g), Number of seeds fruit^{-1}, Fruit plant^{-1} (kg), Fruit yield plot^{-1}, Fruit yield (t ha^{-1}), Total soluble solid (^{0}Brix) and Ascorbic acid (mg/ 100g) of fruit juice. There was significant differences in growth among the all varieties of chilli hybrids. The maximum plant height (cm) and Number of branches plant^{-1} was observed in V_5:F1 Hybrid (75.34cm & 15.59) where as the minimum plant height and Number of branches plant^{-1} (56.45cm & 9.13) was found in V_{14}:F. Andhra Pradesh 3rd. There was significant differences in flowering parameters among the all varieties of chilli hybrids. The minimum Days to first flower initiation and Days to 50% flowering was observed in V_5:F1 Hybrid (30.42 & 38.39) where as the maximum Days to first flower initiation and Days to 50% flowering (45.56 & 49.66) was found in V_{14}:F. Andhra Pradesh 3rd. There was significant differences in yield and yield attributes and fruit quality parameters among the all varieties of chilli hybrids. The maximum Number of fruit plant$^{-1,}$ Length of fruit (cm), Fruit diameter (cm), Weight of fruit (g), Number of seeds fruit$^{-1,}$ Fruit plant^{-1} (kg), Fruit yield plot^{-1} (kg), Fruit yield (t ha^{-1}), Total soluble solid (^{0}Brix) and Ascorbic acid (mg/ 100g) of fruit juice was observed in V_5:F1 Hybrid (52.85, 12.76, 2.18, 4.47, 76.92, 236.77, 3.31, 87.69, 7.44 and 167.52) followed by V_{10}:Farmer Karnataka 1st, V_{15}:Local Kisan variety, V_{13}:F. Andhra Pradesh 2nd, V_{11}:Farmer Karnataka 2nd, V_9:Local Varanasi, V_{12}:F. Andhra Pradesh 1st, V_4:Sun hot, V_1:Mircha -444, V_6:Seirra hybrid, V_3:SPL-AS, V_7:Hybrid tej, V_8:KSP-1251 and V_2:G-4 and minimum Number of fruit plant^{-1}, Length of fruit (cm), Fruit diameter (cm), Weight of fruit (g), Number of seeds fruit$^{-1,}$ Fruit plant^{-1} (kg), Fruit yield plot^{-1} (kg), Fruit yield (t ha^{-1}), Total soluble solid (^{0}Brix) and Ascorbic acid (mg/ 100g) (35.58, 6.04, 1.12, 2.07, 39.11, 73.65, 1.03, 27.28, 3.38, 130.79) was found in V_{14}:F. Andhra Pradesh 3rd.

Table 1: Varietal evaluation of chilli (*Capsicum annuum*) for growth, yield and quality in Prayagraj Agro climatic condition

Varieties notation	Name of varieties	Plant height (cm)	Number of branches plant^{-1}	Days to first flower initiation	Days to 50% flowering	Number of fruit plant^{-1}	Length of fruit (cm)	Fruit diameter (cm)	Weight of fruit (g)	Number of seeds fruit^{-1}	Fruit plant^{-1} (kg)	Fruit yield plot^{-1}	Fruit yield (t ha^{-1})	Total soluble solid (^{0}Brix)	Ascorbic acid (mg/ 100g) of fruit juice
V_1	Mircha -444	68.63	13.28	35.67	42.91	38.73	9.50	2.08	2.44	67.61	94.38	1.32	34.96	6.85	156.59
V_2	G-4	74.42	14.47	31.36	38.36	48.80	11.62	2.11	4.18	71.93	204.00	2.86	75.56	6.77	162.08
V_3	SPL-AS	69.78	11.32	32.50	41.22	41.96	10.32	2.09	4.10	61.63	172.07	2.41	63.73	5.42	158.74
V_4	Sun hot	67.29	13.40	33.23	43.00	43.81	10.07	2.11	3.32	59.39	145.41	2.04	53.86	6.33	149.47
V_5	F1 Hybrid	75.34	15.59	30.42	38.39	52.85	12.76	2.18	4.47	76.92	236.77	3.31	87.69	7.44	167.52
V_6	Seirra hybrid	72.33	12.20	31.43	39.65	49.81	11.24	2.05	3.47	60.92	172.74	2.42	63.98	7.17	161.73
V_7	Hybrid tej	74.77	10.31	32.43	40.25	48.86	10.87	1.91	3.62	62.84	176.66	2.47	65.43	6.62	158.43
V_8	KSP-1251	76.52	11.32	35.31	43.29	48.33	10.27	1.66	3.68	62.92	177.79	2.49	65.85	4.71	159.96
V_9	Local Varanasi	68.69	9.27	36.49	41.53	39.11	10.87	1.58	3.19	63.21	124.77	1.75	46.21	5.29	142.29
V_{10}	Farmer Karnataka 1st	64.40	9.42	44.38	48.89	41.49	8.15	1.94	2.38	49.10	98.42	1.38	36.45	4.40	138.32
V_{11}	Farmer Karnataka 2nd	61.61	10.38	43.32	47.30	41.77	7.87	1.81	2.78	47.22	116.05	1.62	42.98	4.69	134.16
V_{12}	F. Andhra Pradesh 1st	68.64	9.38	43.84	46.59	42.11	6.70	1.90	2.22	47.09	93.65	1.31	34.69	4.29	136.60
V_{13}	F. Andhra Pradesh 2nd	61.65	10.42	43.49	47.25	46.12	7.80	1.97	2.35	42.64	108.41	1.52	40.15	4.40	137.73
V_{14}	F. Andhra Pradesh 3rd	56.45	8.41	45.56	49.66	35.58	6.04	1.12	2.07	39.11	73.65	1.03	27.28	3.38	130.79
V_{15}	Local Kisan variety	60.00	9.36	42.41	48.27	38.55	7.97	2.08	2.32	46.73	89.48	1.25	33.14	4.19	142.64
	F-Test	S	S	S	S	S	S	S	S	S	S	S	S	S	S
	C.D. (0.5%)	0.701	0.339	2.008	2.081	3.710	1.016	0.220	0.217	1.459	16.677	0.233	6.176	0.325	1.115
	S.Ed. (+)	0.342	0.116	0.980	0.719	1.881	0.496	0.108	0.106	0.712	8.141	0.114	3.015	0.159	0.545
	CV	0.616	1.806	3.205	1.016	5.058	6.416	6.916	4.180	1.523	7.176	7.176	7.176	3.561	0.447

Conclusion

From the present investigation, it may be concluded that chilli hybrid V_5:F1 Hybrid resulted in highest yield (87.69q/ha). Since this is based on one season trial therefore, further evaluation trials are needed to substantiate the findings.

References

1. Henderson DE. Thermal decomposition of capsaicin, Interactions with oleic acid at high temperatures. Journal of Agricultural and Food Chemistry 1992;40:2263-2268.
2. Jiang L, Kubota K. Differences in the volatile

components and their odour characteristics of green and ripe fruits and dried pericarp of Japanese pepper 2004;52(13):4197-4203
3. Katheek R. Bharadwaza, Prasad VM, Adinarayana M, Narayana Swamy G. Evaluation of Chilli (*Capsicum annuum* L.) Genotypes for Yield and Yield Attributes in Allahabad Agro-Climatic Conditions. Int. J. Curr. Microbiol. App. Sci 2018;(Special Issue-7):773-776
4. Katheek R, Bharadwaza, Prasad VM, Adinarayana M, Narayana Swamy G. Evaluation of Chilli (*Capsicum annuum* L.) Genotypes for Yield and Yield Attributes in Allahabad Agro-Climatic Conditions. Int. J. Curr. Microbiol. App. Sci 2018;(Special Issue-7):773-776.
5. Kavitha J, Kuttalam S, Chandrasekaran S. Evaluation of spiromesifen 240 SC against chilli mite, Polyphagotarsonemus latus. Ann. Pl. Protec. Sci 2016;14:345-412.
6. Kim S, Lee KW, Park J, Lee HJ, Hwang IK. Effect of drying in antioxidant activity and changes of ascorbic acid and colour by different drying and storage in Korean red pepper (*Capsicum annuum* L.). International J. of Food Science and Technology 2006;41:90-95
7. Kumar AM, Kushwaha ML, Kumar VJ, Singh N. Evaluation of chilli (*capsicum annuum* L.) genotypes for yield and performance against diseases. Progressive Research – An International Journal 2016;11(Special-7):4615-4617.
8. Panse VG, Sukhatme PV. Statistical Methods for Agricultural Workers. ICAR Publications, New Delhi, India, 1985, 359. 16. Rohini N, Lakshmanan V. Evaluation of chilli hybrids for yield and related traits. Trends in Biosciences 2014;7(22):3635-3638.
9. Ruth S, Boscaini E, Mayr D, Pugh J, Posthumus M. Evaluation of three gas chromatography and two direct mass spectrometry techniques for aroma analysis of dried red bell peppers. International J. Mass Spectrometry 2003;223:55-65.
10. Sharma HC, Ortiz R. Host plant resistance to insects:an eco-friendly approach for pest management and environment conservation. Journal of Environmental Biology 2002;23:111-135.
11. Wang Y, Xia Y, Wang J, Luo F, Huang Y. Capsaiciniods in chili pepper (*Capsicum annuum* L.) powder as affected by heating and storage methods. American Society of Agricultural Engineers 2009;52:20072010.
12. Yaldiz G, Ozguven M, Sekeroglu N. Variation in capsaicin contents of different Capsicum species and lines by varying drying parameters. Industrial Crops and Products 2010;32:434-444.