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Evaluation of Different Hybrids for Growth and Yield Attributes of Bitter Gourd (*Momordica charantia* L.) in Prayagraj Region

Ramya Balaga[1*], Anita Kerketta[2] and Samir E. Topno[2]

[1]Horticulture (Vegetable Science), Department of Horticulture, Naini Agricultural Institute, SHUATS, Prayagraj Allahabad - 211007. U. P., India
[2]Department of Horticulture, Naini Agricultural Institute, SHUATS, Prayagraj Allahabad – 211007, U. P., India

**Corresponding author*

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A B S T R A C T

The present investigation entitled "Fifteen different hybrids of Bitter gourd (*Momordica charantia* L.) were evaluated for plant growth and fruit yield in Prayagraj Region" was undertaken at Vegetable research farm, Department of Horticulture, SHUATS, Prayagraj, during 2019-2020. A high analysis of variance revealed significant differences among trail studies, suggesting sufficient variability for high yield and growth. The study revealed that the Akshay (F1 Hybrids) and Ajeet-777 was recorded maximum vine length (638.58), number of branches per plant (53.78), days to first female flower appearance (55.25), days to first male flower appearance (33.17), node no. to which 1st male flower appear (8.39), node no. to which 1st female flower appear (14.49), no. of days for picking (63.47), harvest duration (days) (42.09), fruit length (cm) (20.75), fruit diameter (cm) (10.31), average fruit weight(g) (30.57), no. of fruit per plant (42.77), fruit yield per plot (kg) (1.310), fruit yield (t ha^{-1}) (26.21). The Akshay (F1 Hybrids) and Ajeet-777 was found superior based on the overall performance of different bitter gourd hybrids for growth and yield in Prayagraj conditions.

Introduction

Bitter gourd (*Momordica charantia* L.), 2n=22, is an annual, climber vine. It is monoecious and highly cross pollinated due to a high degree of heterozygosity (Singh *et al.*, 2013). It used as a vegetable and reported to have medicinal properties (Behera *et al.*, 2008). The genus derives its name from the Latin word, mordicus meaning bitten; because the jagged edges of the seed look like bite marks. The green fruits of bitter gourd are superior with regard to its nutritive value compared with any other vegetable. The fruits

contain 2.1 g of protein, 4.2 g of carbohydrates, 1.8 mg of iron, 20 mg of calcium, 88 mg of vitamin C, 55 mg of phosphorus and 210 IU of vitamin A in 100 g of edible portion.In India the per capita land resources (0.121 hectare) are decreasing due to the pressure of the population growth, therefore, it is very important to enhance the production and productivity per unit area. India is the second largest producer of vegetables but as compared with China we are still far behind in production and average productivity. The higher productivity in these countries is due to the coverage of maximum area under hybrids unlike open pollinated varieties in India. Therefore, hybrid varieties can play a vital role in increasing total production and productivity due to their high yield potential, early maturing, superior quality, disease and pest resistance. The rapid increase in productivity per unit area can be achieved by the use of quality seeds with built in inbred and hybrid vigour along with the application of improved vegetable cultivation technologies and government policies. Therefore, growing of hybrid vegetable varieties is one of the better options because the complete potential of hybrids in vegetable crops has not been utilized.

Materials and Methods

The present investigationEvaluation of different hybrids for growth and yield attributes of Bitter gourd (*Momordica charantia* L.,) in Prayagraj region was conducted during the year 2019-2020. The planting materials for present study comprised of the 15 hybrids which were collected from local Prayagraj market (Table 1). The observations were recorded on three randomly selected plants per replication.The data collected on different parameters during the course of investigation were subjected to statistical analysis as per method of analysis of variance (Panse and Sukhatme 1957). The significance and non-significance of the treatment effect were judged with the help of 'F' variance ratio test. Calculated 'F' value (variance ratio) was compared with the table value of 'F' at 5% level of significance. If calculated value exceeded the table value, the effect was considered to be significant.

Results and Discussion

In order to evaluate the listed genotypes the mean of twenty genotypes including check for twenty Characters. Wide range of variation in mean performance of genotypes was observed for all characters under study (Table 2). The mean performance was highly significant for all characters, suggesting that there is ample scope for selection in different traits for the improvements of Bitter gourd. Analysis of variance showed significant differences among the hybrids for the study of the characters at 0.1% and 5% significance.

The highest vine length (cm) were noticed for Akshay (F1 Hybrids) (638.58) and minimum vine length (cm) was found in hybrid Leader (F1 hybrid) (309.60cm).

The highest number of branches per plant were noticed for Ajeet-777 (53.78) and minimum number of branches per plant was observed in hybrid Leader (F1 hybrid) (31.58).

The highest No. of days for picking were noticed for Akshay (F1 hybrid) (63.47) and the lowest No. of days for picking was found in hybrid Leader (F1 hybrid) (53.55).

The highest average fruit length (cm) were noticed for Akshay (F1 hybrid) (20.75) and the lowest fruit length (cm) was recorded in genotypes Venu (F1 hybrid) (9.42).

The highest average fruit diameter (cm) was noticed for Akshay (F1 hybrid) (10.31) and

the lowest fruit diameter (cm) was recorded in hybrid NBGH-951 (5.81).

The maximum average fruit weight (g) was noticed for Akshay (F1 hybrid) (30.57) and the lowest fruit weight (g) was recorded in hybrid Ajeet-777 (21.75).

The highest No. of fruit per plant was noticed for Akshay (F1 hybrid) (42.77) and the minimum No. of fruit per plant was recorded in hybrid genotype Venu (F1 hybrid) (29.51).

The highest Fruit yield per plot (kg) was noticed for Akshay (F1 hybrid) (1.310) and the minimum fruit yield per plot (kg) was found in hybrid Venu (F1 hybrid) (0.374).

The highest Fruit yield (t ha^{-1}) was noticed for Akshay (F1 hybrid) (26.21) and the minimum fruit yield (t ha^{-1}) was found in genotype Venu (F1 hybrid) (7.55).

Table.1 Details of different hybrids of bitter gourd.

Sl. No	Symbol of Hybrids	Name of Hybrids	Source
1	H_1	Venu (F1 hybrid)	Somani Kanak seeds pvt. Ltd
2	H_2	Leader (F1 hybrid)	Semillas fit India pvt. Ltd
3	H_3	992 (F1 hybrid)	Pearl agroscience pvt. Ltd
4	H_4	Satyakar (F1 hybrid)	Raj seed
5	H_5	Akshay (F1 hybrid)	Somani Kanak seeds pvt. Ltd
6	H_6	Ajeet-777	Sheet seed pvt. Ltd
7	H_7	Queen Krishna	Wester bio vegetable seeds pvt. Ltd
8	H_8	Parag	Ankur seed pvt. Ltd
9	H_9	NBGH-951	Nirmal seed pvt. Ltd
10	H_{10}	Acsshoba	Arable crop science pvt. Ltd
11	H_{11}	Leena	Sahara seed India pvt. Ltd
12	H_{12}	Raghav	Jindal crop science pvt. Ltd
13	H_{13}	Katahi	Somani kanak seeds pvt. Ltd
14	H_{14}	Green long	Taiyo Gold Agri Biotech India pvt. Ltd
15	H_{15}	Kantak	Somani Kanak seed pvt. Ltd

Table.2 Performance of bitter gourd hybrids for growth and yield attributes

Hybrid Symbol	Hybrid Name	Vine length (cm)	No of branches / plant	No. of days for picking	Average fruit length (cm)	Average Fruit diameter (mm)	Average fruit weight (gm)	No. of fruit / plant	Fruit yield per plot (kg)	Fruit yield (t ha^{-1})
H_1	**Venu (F1 hybrid)**	361.10	33.63	60.39	9.42	7.94	19.77	32.11	0.635	12.70
H_2	**Leader (F1 hybrid)**	309.60	31.58	53.55	10.11	6.19	20.36	35.77	0.725	14.49
H_3	**992 (F1 hybrid)**	458.07	41.10	55.68	12.61	8.46	20.23	36.98	0.748	14.95
H_4	**Satyakar (F1 hybrid)**	461.35	43.97	58.14	17.64	9.32	19.63	35.76	0.700	14.01
H_5	**Akshay (F1 hybrid)**	638.58	51.51	63.47	20.75	10.31	30.57	42.77	1.310	26.21
H_6	**Ajeet-777**	414.82	53.78	60.95	11.10	7.30	21.75	38.11	0.828	16.56
H_7	**Queen Krishna**	435.90	42.14	60.36	13.30	8.27	12.20	30.80	0.374	7.49
H_8	**Parag**	512.17	49.17	58.96	16.88	6.45	13.23	35.94	0.476	9.52
H_9	**NBGH-951**	408.35	35.67	60.33	10.82	5.81	12.57	29.51	0.375	7.50
H_{10}	**Accsshoba**	465.96	48.17	55.85	14.37	8.33	12.50	37.95	0.476	9.52
H_{11}	**Leena**	436.83	38.50	56.81	9.67	8.00	16.24	33.36	0.543	10.86
H_{12}	**Raghav**	435.69	44.21	58.28	13.60	8.87	12.23	32.71	0.399	7.99
H_{13}	**Katahi**	363.25	44.63	57.65	14.54	7.41	13.32	30.79	0.414	8.28
H_{14}	**Green long**	320.35	41.44	57.55	13.61	6.78	12.80	30.44	0.392	7.85
H_{15}	**Kantak**	414.65	39.95	53.99	17.14	6.14	13.70	34.24	0.466	9.31
Grand Mean		418.91	42.63	58.13	13.70	7.70	16.74	34.48	0.590	11.81
F-Test		S	S	S	S	S	S	S	S	S
C.D. at 0.5%		154.557	2.73	3.71	2.95	2.26	-	-		
S.Ed. (±)		75.46	1.33	1.81	1.44	1.10	--	-		

On the basis of overall findings of the present research study it was concluded that there is wide range of variation in Bitter gourd hybrids for all the characters studied. Akshay (F1 hybrid) and Ajeet-777 resulted in highest growth and yield. Since this is based on one season trial therefore, further evaluation trials are needed to substantiate the findings.

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