

Original Research Article

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Evaluation of Different Cucumber (*Cucumis sativus* L.) Hybrids for their Growth and Yield under Prayagraj Agro-Climatic Conditions

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ABSTRACT

To evaluate different hybrids of cucumber for their growth and yield under Prayagraj Agro-climatic condition; a field experiment was conducted on the research farm of the Department of Horticulture, SHUATS, Prayagraj during rainy season 2019-2020. For the evaluation eleven hybrid varieties such as Chitra, NS 415, Manasi, Don, Shighra, JK Manali, Kohinoor, Ragini, Manish, Raaj and Himani are taken for the study in a Randomized Block Design with three replications in 1.5 x 0.6 m² plot. Early germination was observed in Kohinoor followed by Ragini recorded 4.25 and 4.33 days respectively. The study revealed that the maximum vine length 220.46cm and 220.3cm was reported in Ragini and Himani at an average taken for 30, 60 and 90 days. The number of primary branches was maximum in Ragini 10.43 at 90 DAS. At 90 DAS the number of leaves was high in Ragini followed by Himani which was 73 and 72.10 respectively. Days to first female flower appearance and node to first female flower appearance was minimum seen in Kohinoor and that was about 32.55 and 4.9 respectively. Kohinoor was found to be the best variety for fruit length, weight, and diameter with 19.61cm, 168.44gm and 4.01cm respectively followed by Himani with 18.72cm length 167.37gm weight and 3.89cm diameter respectively. Kohinoor produced the maximum fruit yield/ha and the fruit yield was about 59.7 t followed by Ragini 55.4 t/ha. Among the different varieties studied, Kohinoor performed best for flower, fruit, germination, and yield characters. And the best varieties followed are Himani and V8 Rahina. The study revealed that, the hybrid varieties of cucumber provide high benefit to the farmers through easy cultivation, better stress tolerance, diseases resistance and higher yields.

Keywords

Cucumber, Growth, Varieties, Yield

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Introduction

Cucumber (*Cucumis sativus* L., 2n = 14) belongs to Cucurbitaceae family, containing 118 genera with 825 species, it is one of the most important cucurbitaceous vegetable

crops. They are cross pollinated crop and pollination is commonly fulfilled by honeybee. It is grown in summer season as well as in rainy season. It is a warm season crop mainly grown in tropical and subtropical regions. It requires a short period of time to

mature. It is thermophilic and highly susceptible to frost. It is grown best in the temperature range between 18-30°C. Cucumber can be grown on almost any kind of good soil, a light heavy and well-drained soil, which contains an abundance of organic matter, is favourable for growing cucumber.

Cucumbers are composed of 96% water, which may increase hydration and help you meet your daily fluid needs. It contains good amount of fibre, antioxidants, including flavonoids and tannins, which prevent the accumulation of harmful free radicals and may reduce the risk of chronic disease. Cucumbers are low in calories but high in water and several important vitamins and minerals. Eating cucumbers with the peel provides the maximum amount of nutrients. Cucumbers can be eaten fresh or pickled. They can be enjoyed as a low-calorie snack or used to add flavour in a variety of dishes, all of these may aid in weight loss. Test-tube and animal studies show that cucumber may help lower blood sugar and prevent diabetes-related complications, although additional research is needed.

Cucumbers hold second place (after tomatoes) in fresh vegetable consumption. Cucumbers are cultivated by all governorates in a total area of about 40,000 feddans, mainly as a summer crop. The increasing demand for export makes cucumbers a choice crop for high economic return. New varieties and modern technological practices offer new yield records and have contributed to production of off-season crops. The productivity can be increase by manipulating in various factors i.e. environment, soil, production technology and protection from insect-pest and diseases. The main constrains for cucumber cultivation are irrigation facilities, labour, construction of adequate storage structures in view of the nature of the fruit, and pests and diseases control and management (Umeh and Onovo, 2015).

Hence, for increasing productivity of cucumber and the performance of varieties under particular agro-climatic conditions is essential. With a view to select a high yielding variety, a study was undertaken for its adoptability under Allahabad conditions.

Materials and Methods

The present investigation entitle “Evaluation of different cucumber hybrids for their growth and yield under Prayagraj Agro-climatic condition “ was carried out during first week of August to last week of October the year 2019-20 at Horticulture Research Farm, Department of horticulture, Naini Agriculture Institute, Sam Higginbottom Institute of Agriculture Technology and Sciences, Prayagraj (U.P). The experiment was laid out in randomized block design with three replications on 1st August 2019. The sowing was done on flat beds with spacing of 60 cm and 80 cm plant to plant and row to row respectively, each plot with 6 plants. Adopting the recommended cultivation practices for raising a healthy crop and stacking was given for vine climbing. Data’s were recorded on all the important characters pertaining to the present study.

The pits were made and the seeds were sown, the distance between plant to plant and row to row was 0.6m and 1m respectively three seeds were sown in each pit with 1.5 to 2 cm depth. Thinning of seedling was done with in a period of three weeks and single healthy plant was maintained at each pit. The cultural practices such as irrigation weeding and plant protection measure were carried out uniformly as and when required.

Varieties

V₁ – Chitra

V₂. - Ns 415

V₃ – Manasi
V₄ – Don
V₅ - Shighra
V₆ - Jk Manali
V₇ – Kohinoor
V₈ – Ragini
V₉ – Manish
V₁₀ – Raaj

Results and Discussion

Vegetative growth parameters

Vegetative growth parameters such as germination percentage, plant height (vine length), number of primary branches and number of leaves were influenced significantly amongst different hybrids under Prayagraj Agro-climatic condition.

The hybrid variety V11 ‘Himani’ recorded the maximum plant height and number of leaves i.e. 220.46 cm, L. N. Dongarwa *et al.*, (2017) find out that for radish minimum height was recorded for Pusa Himani (22.70 cm) whereas the minimum plant height and number of leaves were noted in V3 ‘Manasi’ i.e. 181.08 cm and 62.76 respectively.

The hybrid variety V8 Ragini recorded maximum number of primary branches i.e. 10.43 followed by V7 Kohinoor 9.69, whereas minimum number of primary branches was recorded in V5 Shighra i.e. 6.49

The germination percentage was high in V7 Kohinoor followed by V8 Ragini i.e. 4.25 and 4.33 respectively, whereas the minimum germination percentage was recorded in V5 Shighra i.e. 6.25 (Fig. 1 and Table 1).

Floral parameters

Floral parameters like first male and female flower appearance, node to first male and

female flower and male female ratio were influenced significantly amongst different hybrids under Prayagraj Agro-climatic condition.

The hybrid V7 Kohinoor reported the first male and female flower appearance at about 32.55 days and 36.99 days respectively whereas V6 JK Manali and V5 Shighra took maximum days i.e. about 38.87 days and 39.22 days respectively for male and female flower appearance.

Node at which first male flower appeared was noted in V8 Ragini i.e. 4.04 and first female flower appeared was noted in V7 Kohinoor i.e. 4.95, whereas the node at which first male and female flower appeared last was V4 Don i.e. about 6.28 and 6.73 respectively.

The male: female ratio was high in V7 Kohinoor i.e. 6.32 followed by V11 Himani 6.00, whereas the minimum male: female ratio was recorded in V5 Shighra i.e. about 4.05 (Fig. 2 and Table 2).

Yield parameter

Yield parameters such as days to first picking, days to last picking, harvesting duration, fruit diameter, fruit length, fruit weight, average yield per plant, marketable fruit yield and average yield per hectare influenced significantly amongst different hybrids under Prayagraj Agro-climatic condition. The hybrid V7 Kohinoor reported maximum days to first picking, maximum days to last picking and maximum harvesting duration i.e. about 44.89, 75.72 and 25.62 days respectively, whereas the minimum days was reported in V5 Shighra for both days to first picking and harvesting duration V. G. Lajurkar *et al.*, (2017) reported first harvest noticed in hybrid Shighra (51.10 days) for cucumber. V4 Don reported the minimum days taken for last picking. The fruits of V7 Kohinoor were

having the largest fruit diameter, fruit length and fruit weight i.e. about 4.01 cm, 19.61 cm and 168.44 gm respectively, similar results have been reported by S. Vijay Kumar *et al.*, (2018) who has reported that for garden pea

higher pod length was recorded in Kohinoor-10 (8.52cm) and the minimum fruit diameter, fruit length and weight was reported in V5 Shighra i.e. about 3.55 cm, 13.73 cm and 141.27 gm respectively (Fig. 3 and Table 3).

Table.1 Evaluation of different cucumber (*Cucumis sativus* L.) hybrids on their vegetative parameters at different levels

Hybrids	Day taken for germination	Plant height(cm)	Number of primary branches per plant	Number of leaves per plant
V1-CHITRA	5.1	200.21	8.9	69.5
V2-NS 415	5.5	195	8.4	66.3
V3-MANASI	5	181.08	7.1	62.7
V4-DON	5.6	186.6	7.5	63.9
V5-SHIGHRA	6.2	198.18	6.4	65.4
V6-J K MANALI	6.2	195.76	7.4	67.9
V7-KOHINOOR	4.2	213.76	9.6	71.3
V8-RAGINI	4.3	220.46	10.4	73
V9-MANISH	4.6	200.26	7.3	68.6
V10-RAAJ	4.6	210.77	7	70.3
V11-HIMANI	4.4	220.3	9.5	72.1
CD(5%)	0.5	13.5	2.4	0.8

Table.2 Evaluation of different cucumber (*Cucumis sativus* L.) hybrids on their floral parameters at different levels

Hybrids	Number of days to first male flower appearance	Number of days to first female flower appearance	Number of nodes to first male flower appearance	Number of nodes to first female flower appearance	Male : female flower ratio
V1-CHITRA	34.8	37.2	4.4	5.4	5.7
V2-NS 415	35.2	38.7	5.2	6.3	4.7
V3-MANASI	34.3	38.5	4.8	6.2	4.2
V4-DON	35.93	39.2	6.3	6.7	4.5
V5-SHIGHRA	36.9	39.2	5.9	6.4	4.1
V6-J K MANALI	38.8	38.8	5.1	5.3	5.1
V7-KOHINOOR	32.5	36.9	4.1	4.9	6.3
V8-RAGINI	32.6	37.2	4	5.2	5.8
V9-MANISH	33.3	38.8	5	5.6	5.6
V10-RAAJ	34.8	38.7	4.4	5.4	5.4
V11-HIMANI	32.8	37.1	4.2	5.3	6
CD(5%)	0.5	0.6	0.5	0.5	0.2

Table.3 Evaluation of different cucumber (*Cucumis sativus* L.) hybrids on their yield parameters at different levels

Hybrids	Fruit per plant (kg)	Average yield per hectore (t/ha)	Marketable fruit yield (t/ha)
V1-CHITRA	0.9	33.1	24.8
V2-NS 415	1.3	50	37.5
V3-MANASI	0.8	29.2	21.8
V4-DON	0.6	25.9	19.4
V5-SHIGHRA	0.7	22.3	16.7
V6-J K MANALI	1.2	43.5	32.6
V7-KOHINOOR	1.6	59.7	44.3
V8-RAGINI	1.5	55.4	41.6
V9-MANISH	1.1	37.8	28.3
V10-RAAJ	1.3	47.5	35.6
V11-HIMANI	1.4	51.5	38.6
CD (5%)	1.5	2	1.5

Fig.1 Evaluation of different cucumber (*Cucumis sativus* L.) hybrids on their vegetative parameters at different levels

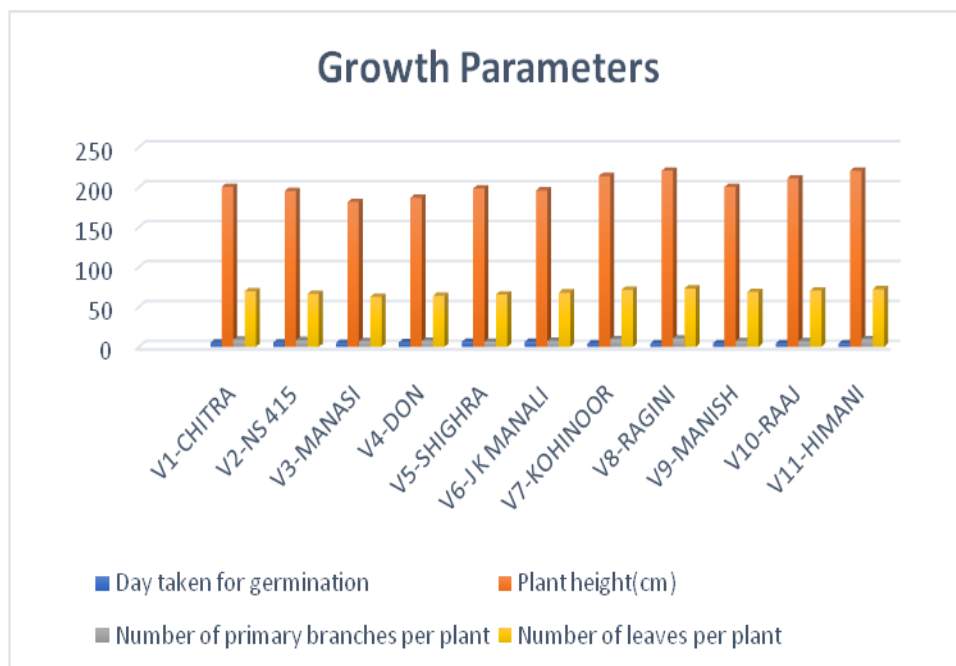


Fig.2 Evaluation of different cucumber (*Cucumis sativus* L.) hybrids on their floral parameters at different levels

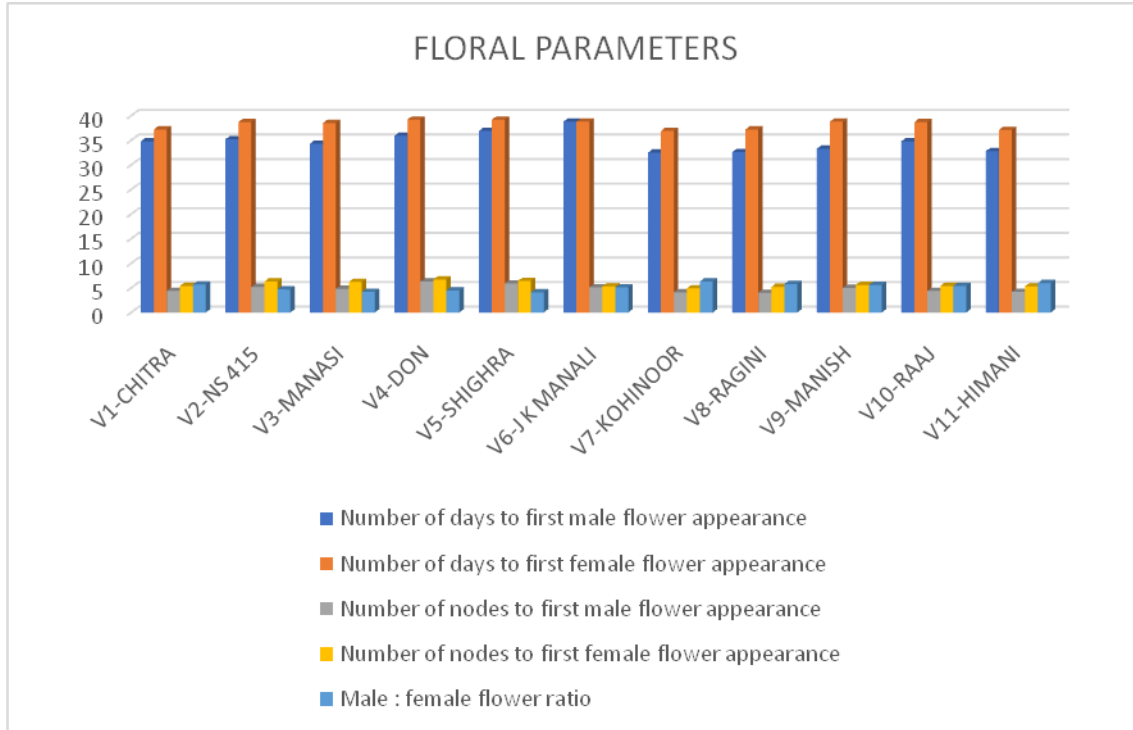
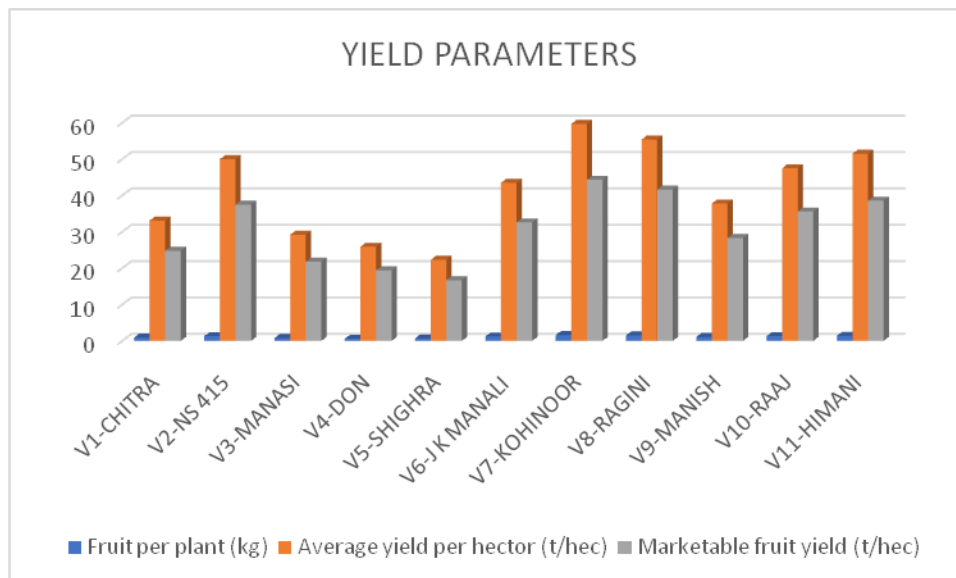


Fig.3 Evaluation of different cucumber (*Cucumis sativus* L.) hybrids on their yield parameters at different levels



The hybrid V7 Kohinoor was having the maximum yield per plant and maximum marketable fruit yield per hectare i.e. 1.66 kg/plant and 44.32 t/ha followed by V8

Ragini 1.5 kg/plant and 41.6 t/ha whereas the minimum yield and marketable fruit yield was recorded in V4 Don i.e. about 0.62 kg/plant and 16.74 t/ha.

Average yield per hectare was also high for V7 Kohinoor i.e. about and 59.76 t/ha followed by V8 Ragini 55.4 t/ha whereas the minimum yield was recorded in V4 Don 22.32 t/ha.

In conclusion, the hybrids of cucumber cultivated in Prayagraj agro-climatic condition displayed significant variations in vegetative development, floral parameters and yield characters, offering a lot of scope to exploit their horticultural potential. For open cultivation, Kohinoor (V7) hybrid recorded the highest fruit yield per plant (1.66 kg), highest fruit yield per hectare (59.76 t/ha), early fruit maturity (44.89 days), minimum days to germination (4.25 days), minimum days to first female flower appearance (36.99 days), highest net return (Rs. 1,60,183) and B:C ratio (3.50:1) followed by Ragini (V8). Therefore, the cucumber hybrid Kohinoor and Ragini could be economically good option for small and marginal farmers for the cultivation in Prayagraj agro-climatic condition.

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