



Thermal resistant genotype of cucumber for riverine tract of Uttar Pradesh under changing climate

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Abstract

The preliminary varietal trial on ten lines of cucumber was conducted at Vegetable Research Station, Kalyanpur, Kanpur during 2019. Out of ten lines five genotypes were found suitable under changing climate. The experiment of five genotypes was conducted at Vegetable Research Station, Kalyanpur, Kanpur during 2021 and Natural Ventilated Insect Proof Net House Kalyanpur during 2019. The verification trials were laid out at Horticultural Research and Training Centre, Basti during 2020 & 2021 and at Farmers Fields of Village Hora Bangar, Kanpur 2020 under State Varietal Trial. The main objective was to find out the suitable cultivar of cucumber for farmers under changing climate. The analysed composite soil sample of sandy loam soil indicated low fertility status. The five genotypes i.e. COE-19-1, COE-19-3, COE-19-6, COE-19-8 and COE-19-10 (control) were tested in R.B.D. under three replications. Genotype COE-19-1 registered highest fruits yield of cucumber by 252.00 q/ha in comparison to other tested genotypes. The genotype COE-19-10 sown as a control gave fruits yield by 237.70 q/ha. The lowest yield was found under genotype COE-19-6 by 193.30 q/ha. The highest fruits/plant (10.17) were also found in genotypes COE-19-1 which was responsible for highest yield under thermal condition.

Keywords: Changing climate, COE-19-1 genotype, Preliminary trial, Thermal condition, Warm climate.

Introduction

The cucumber requires a relatively shorter growing season. Cucumber takes 45-80 days from seedling to maturity. Cucumber does not require as warm a climate. There is more sensitive to fluctuations in light and temperature. A abundance of light gives rise to male flowers through within limits. Similarly higher temperature and long days help the increase in number of male flowers and reduce the numbers

of female flowers. The cucumber is grown both in summer and rainy seasons. The crop of rainy season is more successful than the summer season crop. In summer season crop is grown from January to March, whereas rainy season crop is sown in June to July. The cucumber fruits contain moisture 96.4%, protein 0.4%, fat 0.1%, carbohydrates 2.80%, Ca 0.01%, P 0.03% and Fe 1.5 mg per 100 gm, Vitamin B1 – 30 IU per

100 gm and Vitamin C 7 mg per 100 gm. This combination of nutrients proved beneficial to the human health due to easily digestive (Singh *et al.*, 2021).

It has been observed that riverine tract of Uttar Pradesh is very familiar for production of cucumber. Most of places of cucumber growing are situated in the riverine tract and have light soils, which are very suitable for cucumber production. A number of local and improved cultivars of cucumber are available for cultivation during summer and rainy seasons. Under climate change no cucumber genotype is available for this situation. The flexible breeding plan was prepared to give suitable variety during summer season under climate change, is the subject matter of this manuscript.

Materials and Methods

The preliminary varietal trial on ten lines of cucumber was conducted at Vegetable Research Station, Kalyanpur, Kanpur. Out of ten lines five genotypes were found suitable under changing climate. The experiments on five genotype were conducted at Vegetable Research Station, Kalyanpur, Kanpur during 2021 and Natural Ventilated Insect Proof Net House Kalyanpur, Kanpur during 2019. The verification trails were laidout at Horticultural Research and Training Centre, Basti during 2020 to 2021 and Farmers fields of village Hora Bangar, Kanpur during 2020 under State Varietal Trial. The main objective was to find out the suitable cultivar of cucumber for farmers under changing climate. The composite soil sample was taken and results of composite soil sample exhibited sandy loam texture, having pH 8.0, organic carbon 0.29%, total nitrogen 0.03%, available P₂O₅ 9.70 kg/ha and available K₂O 207 kg/ha, therefore, the fertility status was low. The pH was determined by Electrometric glass electrode method (Piper, 1950), while organic carbon was determined by Colorimetric method (Datta *et al.*, 1962). Total nitrogen was analyzed by Kjeldahl's method as described by Piper (1950). The available phosphorus and potassium were determined by Olsen's method (Olsen *et al.*, 1954) and Flame

photometric method (Singh, 1971), respectively. The farming situation of the area was irrigated. The five genotypes of cucumber, listed in Table 1 & 2 were tested. The sowing was done between 10 March to 15 March and fruits plucked between 10 May to 25 May during the experimental seasons. The recommended agronomical practices were followed to achieved better yield. The irrigations were given as and when required. The experiment was laid out in RBD with three replications.

Results and Discussion

The preliminary varietal trial on ten lines of cucumber was carried out during summer season. Out of ten, five lines were found most suitable for summer season cultivation under changing climate.

The pooled data of tested years on these five genotypes are given in Table - 1 & 2 and discussed here under appropriate heads.

(A) Growth parameters: Perusal of data given in Table-1 make it clear that days to first male flower blossom was noted in genotypes COE 19-6 (29.77 days) and COE 19-1 (30.96 days) in comparison to other tested genotypes. The genotype CDE-19-10 (control) displayed late first male flower blossom (40.18 days). Similarly, first female flower blossom was seen in genotype COE 19-1 (33.60 days) followed by COE 19-6 (38.95 days). The first fruiting knot was noted in COE 19-1 (4.15) followed by COE 19-6 (5.52) as compared to other tested genotypes. The highest primary branches/plant was recorded in genotype COE 19-1 (6.08 branches) followed by COE 19-10 (5.80 branches) and COE 19-6 (5.70 branches) and lowest branches was noted in genotype COE 19-3 (4.76 branches). Genotype COE 19-1 displayed lowest length of main branch (209 cm) and highest length was found in COE 19-10 (364 cm). The lowest leaves or knots/main branch was found in genotype COE 19-1 (35.27), while highest counted in genotype COE 19-3(49.00). The values of leaves or knots/main branch under other tested genotypes were noted under these two limits. The minimum crop duration by 58.28 days

was recorded under genotypes COE 19-1, while maximum noted under genotype COE 19-10 to 72.53 days. Other tested genotypes showed at par crop duration.

Table-1: Mean values of growth parameters of cucumber. (Pooled data of three years).

S.N.	Treatment	Days to first male flower blossom	Days to first female flower blossom	First fruiting knot	Primary branches/plant	Length of main branch (cm)	Leaves or knots/main branch	Crop duration (days)
1.	COE 19-1	30.96	33.60	4.15	6.08	209.00	35.27	58.28
2.	COE 19-3	35.06	40.31	6.68	4.76	338.40	49.00	66.23
3.	COE 19-6	29.77	38.95	5.52	5.70	268.20	36.57	64.47
4.	COE 19-8	34.77	39.51	5.67	5.00	271.40	36.62	63.45
5.	COE 19-10 (control)	40.18	46.45	7.34	5.80	364.00	41.31	72.53

Average Data of -

- (i) Vegetable Research Station, Kalyanpur, Kanpur
- (ii) Naturally Ventilated Insect Proof Net House, Kalyanpur, Kanpur
- (iii) Horticultural Research and Training Centre Basti.
- (iv) State varietal trail on farmers fields, Hora Bangar.

Table-2: Mean values of yield contributing characters and yield of cucumber. (Pooled data of three years).

S.N.	Treatment	Fruits/plant	Length of healthy edible fruit (cm)	Girth of fruit (cm)	Fruits/plant	Fruit weight (gm)	Yield (q/ha)	Reduction in yield compared to best genotype (q/ha)
1.	COE 19-1	10.17	20.17	15.26	10.17	239.64	252.00	-
2.	COE 19-3	8.98	18.87	14.57	8.98	203.78	194.30	57.70
3.	COE 19-6	8.75	19.51	12.21	8.75	190.97	193.30	58.70
4.	COE 19-8	9.71	18.87	15.10	9.71	212.08	204.50	47.50
5.	COE 19-10 (control)	8.68	22.36	16.76	8.68	275.21	237.70	14.30

Average Data of -

- (i) Vegetable Research Station, Kalyanpur, Kanpur
- (ii) Naturally Ventilated Insect Proof Net House, Kalyanpur, Kanpur
- (iii) Horticultural Research and Training Centre Basti.
- (iv) State varietal trail on farmers fields, Hora Bangar.

(B) Yield contributing characters: The maximum fruits/plant 10.17 were counted in genotype COE 19-1 and lowest recorded in genotype COE 19-10 (control) 8.68 fruits/plant. Genotype COE-19-10 displayed maximum length

of healthy edible fruit 22.36 cm followed by COE 19-1 (20.17 cm). Similar trend was also recorded in girth of fruit. The maximum fruits/plant was counted in COE 19-1 (10.17), while lowest fruits/plant recorded in COE 19-10 (8.68).

The maximum single fruit weight was weighed in genotype COE 19-10 by 275.21 gram closely followed by genotype COE 19-1 (239.64 gram).

(C) Yield (q/ha): Genotype COE 19-1 registered highest fruits yield of cucumber by 252.00 q/ha in comparison to other tested genotypes. The genotype COE 19-10 sown as control gave fruits yield by 237.70 q/ha. The lowest yield was found under genotype COE 19-6 by 193.30 q/ha. The considerable improvement in fruits/plant and single fruit weight in COE 19-1 were responsible for highest yield (q/ha). The lowest single fruit weight noted in genotype COE 19-6, supported to the lowest yield (q/ha).

Conclusion and Recommendation

The ten lines of cucumber tested in preliminary varietal trial and obtained five lines superior for cultivation. Out of five genotypes, the variety COE 19-1 proved superior and gave highest fruits yield. Therefore, this cultivar can be suggested for cultivation with the new name of “Azad Ageta Khira”, during summer season under changing climatic condition.

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