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Short communication

Performance of cucumber varieties in a naturally ventilated polyhouse

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Cucumber is one of the most preferred vegetables grown under protected conditions in the developed world. Its demand is throughout the year because of its popular use in salad dish, sandwich, pizza preparations etc. In India it is traditionally grown in *zaid* and *kharif* seasons. However, being a high value low volume crop, its exploitation on commercial scale in poly-green-house as off-season crop can generate handsome income to the growers. Compared to open field, very high yields of cucumber have been reported even under naturally ventilated polyhouse (Srivastava and Singh, 7). A numbers of hybrids have been recently developed in the country in this crop but little effort has been made so far to evaluate them for their suitability of growing under greenhouse conditions. With this view, screening of available varieties under protective cover was carried out to identify suitable varieties for off-season production with superior quality.

Two independent trials were conducted during winter season at Vegetable Research Center of the G.B. Pant University of Agriculture and Technology, Pantnagar. In the first trial, conducted during first two years, four cucumber varieties were tested for their off-season performance in a naturally ventilated polyhouse. In the first year, the varieties Poinsett, Pant Sankar Kheera-1, Pant Kheera-1, and Phule Prachi were included, while during second year, Phule Prachi was replaced by US-6125 due to non-availability of seeds. The second trial was conducted during third year in which eleven open-pollinated varieties / hybrids were tested including Poinsett, Pant Sankar Kheera-1, Pant Kheera-1, US-6125, Rani, Noori, Tripti, Phule Shubhangi, Sheetal, Kalyanpur Green and Ragini. Cucumber seeds were sown on 17-10-02, 11-11-03 and 01-11-04 during first, second and third year, respectively. The spacing was maintained at 80 cm × 50 cm having 8 plants in each variety. Five replications were kept in first trial; while in second trial three replications were adopted in a randomized block design. The crop duration was six months in each year. The observations were recorded on growth, maturity and yield characters.

As evident from Table 1, significant variations occurred among the varieties for all the characters observed. During first year the Poinsett recorded the maximum length but during second year Pant Kheera-1 registered significantly larger length compared to all the remaining varieties. The maturity was earliest in Phule Prachi which was closely followed by Poinsett and both differed significantly from the rest. In the second year US-6125 and Poinsett, being at par, showed significant earliness over the other two varieties. The number of fruits per plant, yield per plant and total yield per ha were recorded maximum in the variety Poinsett, which exhibited significant superiority over the others. The average fruit weight was maximum in Pant Sankar Kheera-1 in both the years. However, it differed significantly only with Phule Prachi during first year and with Poinsett during second year.

The variation in vine length ranged from 0.57 m in the open-pollinated variety Kalyanpur Green to 3.17 m in the hybrid variety Tripti (Table 1). Such variation in vine length as affected by different varieties has also been reported by Rastogi and Arya (4), Prasad and Singh (3), and Samadia (5). Largest numbers of primary branches per plant were observed in Phule Shubhangi, which differed significantly from all the other varieties. The nodal position of first female flower ranged from 3.1 to 7.95 and the variety Poinsett producing the first female flower at 3rd node proved significantly superior to several other varieties. However, the earliest anthesis of first female flower (45.33 days) occurred in the hybrid US-6125, which showed significant superiority over most of the other varieties. This trend was due to inherent genetic variability as confirmed by Abusaleha and Dutta (1), and Prasad and Singh (3). Exhibiting the same trend, the earliest harvest was also available in variety US-6125, which being just similar to Noori, differed significantly with most of the other varieties. Such varietal varation was also reported by Solanki and Seth (6), Rastogi and Arya (4), Verma (8), and Kumar *et al*. (2).

Among the eleven varieties, Poinsett ranked first in terms of number of fruits per plant which was large 32.80 closely followed by Phule Shubhangi. The variety Poinsett recorded significantly larger number of fruits per plant compared to all other varieties. A wide range of variation in fruit weight existed which ranged from 122.2 g in variety Noori to 400 g in variety Tripti.

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Table 1. Performance of cucumber varieties in a naturally ventilated polyhouse.

Variety	Main vine length (m)			Days to 1st harvest			No. of fruits per plant			Yield/plant (kg)			Mean fruit weight (g)			Yield (q/ha)		
	1	2	Mean	1	2	Mean	1	2	Mean	1	2	Mean	1	2	Mean	1	2	Mean
Poinsett	2.21	2.92	2.57	68	84	76.0	20.18	45.78	32.98	3.76	8.47	6.12	186.2	186.2	186.2	842.2	1931.8	1387.0
Pant Sankar Kheera-1	1.93	2.99	2.46	75	92	83.5	14.51	17.15	15.83	2.75	5.44	4.10	188.8	303.6	246.2	544.7	907.6	726.2
Pant Kheera-1	1.93	4.00	2.97	83	97	90.0	15.20	16.23	15.72	2.81	4.65	3.73	185.0	291.0	238.0	518.7	960.2	739.5
Phule Prachi	2.18	-	2.18	64	-	64.0	17.94	-	17.94	3.12	-	3.12	174.2	-	174.2	703.1	-	703.1
US-6125	-	2.57	2.57	-	79	79.0	-	16.21	16.21	-	3.77	3.77	-	250.8	250.8	-	948.4	948.4
CD at 5%	0.139	0.989		5.090	5.93		2.889	5.55		0.568	2.42		10.650	76.57		87.76	257.7	

1 = 1st year, 2 = 2nd year

Table 2. Performance of open-pollinated cucumber varieties in a naturally ventilated polyhouse.

Variety	Main vine length (m)	No. of primary branches per plant	Position of 1st female flower	Days to first female anthesis	Days to first harvest	No. of fruits per plant	Average fruit weight (g)	Yield per plant (kg)	Total fruit yield (q/ ha)
Poinsett	2.77	6.77	3.10	69.3	92.3	32.8	206	5.27	1463
Pant Sankar Kheera-1	2.83	5.10	7.77	74.2	85.3	6.9	200	1.57	452
Pant Kheera-1	2.00	4.83	7.53	75.1	95.0	8.0	212	1.97	512
US-6125	2.00	4.70	4.33	45.5	66.7	12.4	194	1.90	523
Rani	2.30	3.90	7.93	58.1	74.7	8.4	336	2.30	643
Noori	1.43	4.90	5.33	46.3	66.7	6.3	122	0.87	277
Tripti	3.17	6.97	7.53	66.6	81.3	6.8	400	1.83	504
Phule Shubhangi	2.70	10.23	4.70	63.1	83.7	25.7	228	4.70	1302
Sheetal	1.10	3.20	5.03	61.9	74.7	3.5	153	0.47	149
Kalyanpur Green	0.57	1.73	4.67	65.1	88.3	1.1	125	0.13	41
Ragini	1.40	3.83	5.33	64.1	83.0	5.9	178	1.17	391
CD at 5%	0.93	2.04	2.91	14.69	15.75	7.9	111.4	1.57	403.5

Considering larger consumer preference for around 200 g average fruit weight, the variety Poinsett, Pant Kheera-1, Pant Sankar Kheera-1, US-6125, Phule Shubhangi and Ragini appeared to be better. Fruit yield is uaually the most important index for selecting varieties with high yield potential on per unit area basis which determines commercial value. The mean fruit yield per plant (5.27 kg) and per ha (1463.33 q) were found maximum in Poinsett. This may possibly be due to the better adaptability of this variety to the polyhouse condition, which resulted in comparatively better vine length, more number of primary branches and largest number of fruits per plants. Presuming 500 q / ha yield as standard, based on the performance over three years, besides above two varieties the other varieties whose performance could be considered as satisfactory were: Pant Kheera-1, Pant Sankar Kheera-1, Phule Prachi, US-6125, Rani and Tripti.

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