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Evaluation trial of bottle gourd

■ **B. SINGH[1]** AND **S.K. SINGH**

Members of the Research Forum

Associated Authors:
[1]Department of Horticulture, Sam Higginbottom Institute of Agricult4ure Technology and Science, Naini, ALLAHABAD (U.P.) INDIA

Author for correspondence :
S.K. SINGH
Department of Horticulture, Sam Higginbottom Institute of Agricult4ure Technology and Science, Naini, ALLAHABAD (U.P.) INDIA
Email : sandeephort0233@gmail.com

ABSTRACT : The present study entitled evaluation trial of bottle gourd was carried out at Experimental Farm of the Department of Horticulture, Sam Higginbottom Institute of Agriculture, Technology and Sciences, Allahabad, during *Zaid* season of 2009-2010. The experiment was laid out in Randomized Block Design comprised of eight treatment combinations of different genotypes of bottlegourd *viz.*, T_1: Damini, T_2: Prasad (NBGH-4000), T_3: Anmol, T_4: Anokhi, T_5: Virat (NBGH-168), T_6: US-15, T_7 : Local round, T_8: Local long. Among all the treatment combinations, treatment T_5: Virat recorded best in terms of days to first male flower anthesis (43.09), days to first female flower anthesis (44.21), days to first harvest (51.14), fruit length (37.04 cm), number of fruits per plant (9.55), fruit weight (1295.03 g), fruit yield (617.14 q/ha), seed pulp ratio (14.50), net income (Rs.471074.24) and cost benfit ratio (1:4.23). Treatment T_8 performed best in case of number of nodes to first male flower appearance (16.38) and number of nodes to first male flower appearance (17.49) Treatment T_5 produced maximum flower, fruit yield and most economics, therefore, can be recommended to farmer for commercial cultivation.

KEY WORDS : Bottle gourd, Genotypes

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Bottle gourd (*Lagenaria Sicerariea* Molina) is an important cucurbitaceous crop grown throughout the country. It is a warm season vegetable, which thrives well in warm and humid climate, but it can be grown through the year in Northern India plains as off-season vegetable. The young and tender fruits of bottle gourd are mostly used as vegetable preparations. However, the delicious preparations like burfee, halwa, petha, raita, juice, etc. are also common. Dry shells of the mature fruits are used to make containers and musical instruments. Different parts of bottle gourd have got medicinal properties also. It contains 46.3% water, 2.9% carbohydrates, 0.2% protein, 0.5% fat, 0.5 mineral matter, 11.00 mg of vitamin C per 100 g pulp of bottle gourd. Bottle gourd is monoecious crop with an exceptional and dimonoecious sex form (Singh *et al.*, 1996). It is highly cross-pollinated crop in which a large amount of variation is observed in many economically important traits. The available hybrids and genotype developed by the crossing of dissimilar male and female parent develops the available hybrids; these are valuable for yield and yield component traits. The proper evaluations of hybrids are essential for understanding the potentiality of hybrids for large area production under the Allahabad agro-climatic conditions.

RESEARCH METHODS

The field experiment was conducted during consecutive Zaid season of 2010 at Experimental Research Farm, Department of Horticulture, Sam Higginbottom Institute of Agriculture, Technology and Sciences Allahabad. The experiment was laid out in Randomized Block Design comprised of eight treatments combinations of different genotypes of bottlegourd *viz.*., T_1 : Damini, T_2: Prasad (NBGH-4000), T_3 : Anmol, T_4 : Anokhi, T_5: Virat (NBGH-168), T_6: US-15, T_7 : Local round, T_8: Local long. In order to prevent the occurance of pathological disease two spraying with diathane M-45@ 2.5 kg/ha was done and for protecting against insect pest metasystox-25EC@ 1.0-1.5 % was sprayed. Observations were recorded on days to first male flower anthesis, days to first female flower anthesis, number of nodes to first male flower appearance, number of nodes to first male flower appearance, days to first harvest, fruit length (cm), fruit diameter (cm), number of fruits per plant, fruit weight (g), fruit yield (q/ha), seed pulp ratio, ascorbic acid (mg/100g), number of branches per plant, vine length (m), net income (Rs) and cost benfit ratio.

RESEARCH FINDINGS AND DISCUSSION

The results obtained from the present investigation as

well as relevant discussion have been summarised under following heads:

Days to first male flower anthesis:

All the hybrids and genotype showed the significant difference for days to first male flower anthesis Table 1. Days to first male flower anthesis varied from 43.09 to 58.77 days. Maximum days (58.77) required to first male flower anthesis was recorded in case of genotype Local round followed by Local long (56.72) and hybrid US-15 (48.38). Minimum days (43.09) taken to first male flower anthesis was recorded in Virat NBGH-168. Similar results were reported by Solanki and Seth (1980) and Ram *et al.* (1996).

Days to first female flower anthesis:

The observation for this trait (Table 1) indicated that genotype Virat (NBGH-168) recorded to have first female flower anthesis (44.21). Maximum days (59.20) required to first female flower anthesis were recorded in Local round followed by Local long (58.10), US-15 (50.08). Similar results were reported by Mangal *et al.* (1981), Mohanty *et al.* (2002) and Wani *et al.* (2008).

Number of nodes to first male flower appearance:

The data pertaining to number of nodes to first male flower appearance is presented in Table 1. The maximum number of nodes to first male flower appearance (16.38) was recorded in Local long followed by Local round (13.50), hybrid US-15 (12.64) and minimum days (8.52) in Damini. Similar results were reported Singh *et al.* (1996), Ram *et al.* (1996) and Dubey and Ram (2008).

Number of nodes to first female flower appearance:

Perusal of the data (Table 1) revealed that Prasad (NBGH-4000) had minimum (10.23) number of nodes to first female flower appearance. Maximum days (17.49) required for appearance of number of nodes to first female flower was recorded in Local long and was followed by Local round (14.35) and Anokhi (12.65). Similar results were reported by Ram *et al.* (1996), Kumar *et al.* (1999) and Dubey and Maurya (2007).

Days to first harvest:

Comparision of data recorded on this trait showed significant differences among the genotypes (Table 2). Maximum days (69.06) taken to first harvest was recorded in Local round followed by Local long (67.52), Anokhi (56.79) and minimum (51.14) in Virat (NBGH-168). Similar results were reported by Singh *et al.* (1996), Singh (1988) and Dubey and Maurya (2007).

Fruit length (cm):

It is evident from Table 2 that maximum fruit length (37.04

Table 1 : Days to first flower (male and female) anthesis and number of nodes to first flower (male and female) appearance of different genotypes of bottle gourd

Treatments	Days to first flower anthesis		Number of nodes to first flower appearance	
	Male	Female	Male	Female
T_1 - Damini	46.12	47.22	8.52	11.45
T_2 – Prasad (NBGH-4000)	44.20	45.67	8.65	10.23
T_3 – Anmol	45.56	46.48	10.15	11.80
T_4 – Anokhi	46.30	48.46	11.46	12.65
T_5 - Virat (NBGH-168)	43.09	44.21	10.05	11.25
T_6 - US-15	48.38	50.08	12.64	12.50
T_7 - Local round	58.77	59.20	13.50	14.35
T_8 - Local long	56.72	58.10	16.38	17.49
C.D. (P=0.05)	0.83	0.32	0.33	1.20

Table 2 : Yield and yield contributing traits of different genotypes of bottle gourd

Treatments	Days to first harvest	Fruit length (cm)	Fruit diameter (cm)	Number of fruits per plant
T_1 – Damini	55.44	36.02	7.78	7.88
T_2 -Prasad (NBGH-4000)	53.96	36.03	7.83	8.55
T_3 - Anmol	54.21	33.09	8.14	7.55
T_4 – Anokhi	56.79	35.64	7.90	8.10
T_5 -Virat (NBGH-168	51.14	37.04	7.82	9.55
T_6 - US-15	56.68	36.88	7.87	7.42
T_7 - Local round	69.06	21.42	12.19	6.44
T_8 - Local long	67.62	33.79	8.06	6.66
C.D. (P=0.05)	0.95	2.65	0.32	1.12

cm) was attained in Virat (NBGH-168) which was significantly higher than other genotypes. However, minimum fruit length (21.42 cm) was recorded in Local round. Similar results were reported by Prasad *et al*. (1988) and Dubey and Ram (2008).

Fruit diameter (cm):

Perusal of the data (Table 2) revealed that Local round had maximum (12.19 cm) fruit diameter which was followed by hybrid Anmol (8.14 cm), Local Long (8.06 cm). Minimum fruit diameter (7.78 cm) was observed in hybrid Damini which was significantly lower than other genotypes. Similar results were reported by Singh (1988), Iapichino *et al.* (2009) and Dubey and Ram (2008).

Number of fruits per plant:

The data pertaining to number of fruits per plant are presented in Table 2. Maximum (9.55) number of fruits per plant was recorded in hybrid Virat (NBGH-168) which was followed by hybrid Prasad (8.55) and minimum number of fruit per plant (6.44) was observed with Local round. Similar results were reported by Kanwar *et al.* (2003), Ramchandran *et al*. (1981), Dubey and Ram (2008) and Wani *et al*. (2008).

Fruit weight (g):

It is evident from Table 3 that maximum fruit weight (1295.03 g) was recorded in Virat (NBGH-168) which was followed by Prasad (1286.92 g) and Anmol (1250.59 g). However, minimum fruit weight (1229.48 g) was recorded in US-15 hybrid. Similar results were reported by Singh *et al.* (1991), Kumar *et al*. (1999), Ram *et al.* (1996), Dubey and Maurya (2007) and Wani *et al.* (2008).

Fruit yield (q/ha):

All the hybrids and genotype showed significant difference for fruit yield (Table 3). Maximum fruit yield (617.14 q/ha) was recorded in Virat (NBGH-168) which was followed by hybrid Prasad (550.40 q/ha), hybrid Anokhi (506.94 q/ha). However, minimum yield (396.62 q/ha) was observed in Local Round. Similar results were reported by Ram *et al*. (1996) and Wani *et al.* (2008).

Seed pulp ratio:

The mean value of genotypes revealed that Virat (NBGH-168) had maximum seed pulp ratio (14.50) which was significantly higher than other genotypes. Minimum seed pulp ratio (9.46) was observed with hybrid Anmol. Similar results were reported by Vijay (1987) and Kanwar *et al.* (2003).

Ascorbic acid (mg per 100g):

Data obtained on this trait revealed significant variation among the genotypes. The maximum ascorbic acid (10.98 mg) content in bottle gourd was recorded with genotypes US-15 which was followed by hybrid Prasad (10.92 mg), Virat (10.91 mg) and minimum (9.66 mg) in Local long.

Table 3 : Yield and quality parameters of different genotypes of bottle gourd

Treatments	Fruit weight (g)	Fruit yield (q/ha)	Seed : pulp	Ascorbic acid (mg/100g)
T_1 - Damini	1234.49	481.21	10.10	10.76
T_2 - Prasad (NBGH-4000)	1286.92	550.40	12.07	10.92
T_3 - Anmol	1250.59	469.32	9.46	9.87
T_4 - Anokhi	1249.99	506.94	13.03	10.89
T_5 - Virat (NBGH-168)	1295.03	617.14	14.5	10.91
T_6 - US-15	1229.48	497.21	14.21	10.98
T_7 - Local round	1230.61	396.62	10.36	10.14
T_8 - Local long	1238.6	413.55	9.58	9.66
C.D. (P=0.05)	45.87	74.05	0.23	0.12

Table 4 : Vine growth and economics parameters of different genotypes of bottle gourd

Treatments	Number of branches per vine	Vine length (m)	Net income per hectare (Rs)	C:B
T_1 –Damini	21.88	6.66	333647.54	1:3.26
T_2 -Prasad (NBGH-4000)	32.66	7.33	360577.54	1:3.75
T_3 – Anmol	24.66	6.11	322473.44	1:3.19
T_4 - Anokhi	30.12	5.16	360577.54	1:3.46
T_5 - Virat (NBGH-168)	26.22	5.53	471074.24	1:4.23
T_6 - US-15	24.55	5.34	350531.74	1:3.39
T_7 - Local round	27.88	5.67	251204.24	1:2.73
T_8 - Local long	32.33	6.87	267903.44	1:2.84
C.D. (P=0.05)	1.42	0.34	-	0.65

Number of branches per vine:

All the hybrids and genotype showed significant differences for number of branches per vine (Table 4). Maximum number of branches per vine (32.66) was recorded with Prasad followed by Local long (32.33), Anokhi (30.11) and minimum number of branches per vine (21.88) in Damini. Similar results were reported by Ram *et al.* (1996) and Dubey and Ram (2008).

Vine length (m):

It is evident from Table 4 that maximum vine length (7.33 m) was recorded in Local long which was significantly higher than other genotypes. However, minimum vine length (5.16 m) was observed with Anokhi. Similar results were recorded by Ram *et al.* (1996).

Net income per hectare (Rs.):

The maximum net income per hectare was obtained with hybrid Virat (Rs.471074.24) and was followed by the hybrid Prasad (Rs. 360577.54). The minimum net income per hectare was obtained with genotype Local Round (Rs. 251204.24).

Cost of benefit ratio:

Among the different hybrids and genotype the hybrid Virat had the highest cost: benefit ratio (1:4.23), followed by hybrid Prasad (1:3.75) and the lowest cost: benefit ratio was recorded with the genotype Local Round (1:2.73).

Conclusion:

In view of the experimental results obtained during the present investigation, hybrid Virat (NBGH-168) showed the maximum fruit yield per hectare *i.e.* 617.24 q/ha and cost benefit ratio of 1:4.23.

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