Int.J.Curr.Microbiol.App.Sci (2018) *7*(4): 2239-2243

International Journal of Current Microbiology and Applied Sciences
***ISSN: 2319-7706* Volume 7 Number 04 (2018)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2018.704.255

Evaluation on Mean Performance in Bottle Gourd [*Lagenaria siceraria* (Molina) Standl] Genotypes

Akshay Jain*, S.P. Singh, Rajneesh Shukla and Sriom

Department of Vegetable Science Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad-224229 (U.P.), India

**Corresponding author*

Keywords

Mean performance, Genotypes, Fruit yield, Bottle gourd

Article Info

Accepted:
20 March 2018
Available Online:
10 April 2018

A B S T R A C T

An experimental was conducted with 40 genotypes for 13 characters was laid out during March 2013 to August 2013 Randomized Block Design at Main Experiment Station, department of vegetable science, NDUA&T Kumarganj, Faizabad (U.P.). The character Studied were Days to first harvest, Number of fruits per plant, marketable fruit yield (kg/plant) The grand mean of marketable fruit yield (kg/plant) was 4.37 kg with the lowest fruit yield per plant of 1.46 kg recorded in NDBG-613-2 and the highest fruit yield of 7.95 kg, fruit yield per plant recorded in NDBG-619-11-2 other genotypes were found to be non-significant for this character. The general mean for all genotypes was 4.36 for this character and out of forty genotypes were non-significant.

Introduction

Bottle gourd [*Lagenaria siceraria* (Molina) Standl, 2n =22] also called as birdhouse gourd, trumpet gourd, white flowered gourd and calabash gourd, is one of the most ancient crops with its man's association since 12000 B.C., as indicated by archeological remains in Peru (Esquinas-Al cazae and Gulick, 1983). It is a popular cucurbitaceous crop in India and cultivated in other tropical and sub-tropical regions of the world. The tender fruits are also used to prepare sweets, rayata and pickles. The dried shells of mature fruits are extremely hard and are used as containers, utensils, musical instruments, floats of fishnets or ornamental items. The leaves are also used to prepare vegetable and they have higher nutritive value than fruits, in respect of protein, fat, minerals, fibre, carbohydrate, energy, calcium and phosphorus contents (Gopalan *et al.*, 1982). Different plant parts of bottle gourd have several putative medicinal properties (Chopra, 1986; Moreman, 1998; Chaudhary, 2001; Manandhar, 2002).

As per FAO, estimates the world acreage under gourd and squashes is about 1.462 million hectares with a total annual production of 18.98 million tonnes with the productivity

of 12.97 tonnes per hectare (Anonymous, 2004). Bottle gourd occupies a prominent position among various cucurbit crops grown in India. It is cultivated in an area of 1.17 lakh hectares with a production of 1.42 million tonnes leading to a productivity of 12.12 tonnes per hectare (Sidhu, 2002). Like other cucurbits – bottle gourd is a summer season vegetable under the north Indian climatic conditions, it is mainly cultivated both in spring- summer (February to June) and rainy (July to November) seasons.

Materials and Methods

The experimental material comprised of forty genotypes of bottle gourd with two checks was evaluated at Main Experiment Station of Department of Vegetable Science, at Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.). Geographically the experimental site falls under humid sub-tropical climate and is located in between 24.47º and 26.56º N latitude, and 82.12º and 83.58º E longitude at an altitude of 113 m above the mean sea level in the Gangetic Alluvial Plains of eastern Uttar Pradesh.

The experiment was conducted in Randomized Block Design with three replications to evaluate forty bottle gourd genotypes. Individual plot dimension was 3 m x 3 m with a row to row spacing of 3 m and plant to plant spacing of 50 cm. Thus six plants were maintained in individual plots. Recommended doses of F.Y.M. and fertilizers were applied. The required pesticides and fungicides were used, as and when required to save the crop from pests and diseases, respectively. The observations were recorded from five randomly selected plants from each treatment in each replication. Observations on the following parameters were recorded using the standard procedure: node number to first staminate flower anthesis, node number to first pistillate flower anthesis, days to first staminate flower anthesis, days to first pistillate flower anthesis, days to first harvest, fruit length/polar length (cm), fruit circumference (cm), fruit weight (kg), number of fruits/plant, vine length at the time of last harvest (m), number of primary branches/vine at the time of last harvest, fruit yield (kg/plant) and fruit yield (q/ha). The replicated mean data recorded will be analyzed according to Panse and Sukhatme (1989). Coefficient of variability is according to Burton and de Vane (1953). Heritability as suggested by Hanson *et al.,* (1956). Genetic advanced (GA) was calculated by the method suggested by Johnson *et al.,* (1955), and Correlation coefficient as suggested by Al-Jibouri *et al.,* (1958). The Experimental was laid out in an RBD design and data were calculated with analysis of variance (ANOVA)

Results and Discussion

The mean performance for adjusted mean, range and least significant difference of 40 bottle gourd genotypes for 13 characters are presented in table node number to first staminate flower anthesis varied from NDML-NS-11 (5.30) to General mean of trait for all genotypes ware found (7.38). Node number to first pistillate flower anthesis varied from NDML-SS-15 (6.20) to General mean of this trait for all genotypes was (10.88) days to first staminate flower anthesis NDML-NS-11 (42.67 days) to General mean of this trait for all genotypes was (46.97). days to first pistillate flower anthesis NDML-SS-17 in (44 days) to General mean of this trait for all genotypes was (49.11) days to first harvest NDML-SS-13 (54.00) to 63.33 General mean of this trait for all genotypes was (58.77 days), fruit length/polar length (cm) NDML-SS-13 (18.63) to NDML-SS-16 (24.37) General mean of this trait for all genotypes was (30.29) fruit circumference (cm) NDBG-619-6-4 (19.60) to NDML-SS-18 (43.17)

Table.1 Mean performance of the forty bottle gourd genotypes for 13 economic traits

SN	Characters	Node number to 1st staminate flower anthesis	Node number to 1st pistillate flower anthesis	Days to 1st staminate flower anthesis	Days to 1st pistillate flower anthesis	Days to 1st harvest	Fruit length/ polar length	Fruit circumference (cm)	Fruit weight	Number of fruits/ plant	Vine length (m)	Primary branches/ vine at last harve\st	Fruit yield (kg /plant)	Fruit yield (q/ha)
		1	2	3	4	5	6	7	8	9	10	11	12	13
Long fruited pale green genotypes														
1	NDBG-140	6.13	9.53	45.00	48.00	56.33	34.70	23.57	0.89	5.10	6.73	14.67	5.01	303.96
2	NDBG-601-1	7.77	12.30	48.33	51.00	60.33	40.93	20.80	0.96	4.87	6.03	13.08	4.54	302.64
3	NDBG-601-2	8.00	12.00	49.00	50.67	60.00	46.27	21.90	0.94	6.03	5.59	14.17	5.53	368.64
4	NDBG-601-3	6.50	11.30	45.00	50.33	60.67	49.33	21.97	0.97	5.53	7.30	15.33	5.14	342.60
5	NDBG-601-4	6.40	11.93	45.00	50.00	59.00	46.43	20.87	0.95	4.37	5.16	13.00	4.24	282.66
6	NDBG-619-6-1	7.60	11.80	45.00	48.00	59.33	43.57	22.37	0.85	4.83	5.09	13.39	4.23	281.94
7	NDBG-619-6-2	6.70	10.37	45.67	48.67	60.00	46.49	21.33	0.91	3.37	4.90	10.45	3.12	207.96
8	NDBG-619-6-3	8.20	11.53	48.67	48.33	58.67	41.67	21.23	0.82	4.53	5.58	15.32	3.71	247.26
9	NDBG-619-6-4	9.50	13.83	49.67	51.67	59.33	46.63	19.60	0.93	5.37	5.50	12.67	5.19	345.96
10	NDBG-619-11-1	7.53	10.33	45.67	47.33	55.67	41.23	22.87	0.94	5.90	4.66	10.08	5.28	351.96
11	NDBG-619-11-2	8.80	11.23	46.67	45.33	57.67	42.33	21.50	0.95	8.37	6.24	11.67	7.95	529.92
12	NDBG-619-11-3	8.73	12.63	46.67	47.00	60.00	41.23	21.47	0.93	6.03	7.15	14.33	5.60	373.32
13	NDBG-701	8.57	11.43	46.00	51.33	59.33	42.00	21.30	0.94	6.77	5.68	11.53	6.22	414.60
14	NDBG-703	8.27	10.13	47.67	51.00	60.00	36.60	21.93	0.84	6.90	4.62	10.67	6.22	414.60
15	Narendra Rashmi (Check)	7.30	11.80	45.67	47.33	60.33	36.43	23.17	0.87	6.27	6.53	12.50	5.95	396.60
Long fruited striped green genotypes														
16	NDBG-613-1	10.37	15.60	50.23	52.00	62.67	35.37	22.57	0.79	4.37	5.93	12.12	3	230.64
17	NDBG-613-2	8.00	15.13	49.33	51.67	63.33	37.10	23.07	0.74	1.97	5.29	12.58	1.46	97.32
18	NDBG-613-3	7.20	13.23	45.00	47.67	56.33	42.37	23.00	0.90	3.50	6.17	14.77	3.31	220.62
19	Narendra Dharidar (Check)	9.43	11.23	48.33	50.00	60.00	34.77	22.97	0.87	8.50	6.04	15.25	7.83	521.94
Round fruited pale green genotypes														
20	RDPG-NS-1	6.97	9.63	47.00	51.00	59.00	18.97	41.73	0.89	2.67	6.03	10.10	2.71	180.66
21	RDPG-NS-2	5.87	8.93	45.00	50.33	58.00	22.57	33.88	0.84	2.80	5.08	12.00	2.96	197.28
22	RDPG-NS-3	6.03	9.47	46.33	48.67	57.67	20.93	36.33	0.84	4.80	4.28	6.66	3.99	265.92
Round fruited striped green genotypes														
23	NDML-SS-1	7.17	11.40	47.00	51.87	61.33	19.00	39.92	0.89	5.63	5.15	11.81	5.19	345.96
24	NDML-SS-2	8.03	11.87	48.67	50.00	60.33	18.87	39.30	0.92	3.03	5.25	11.02	2.75	183.30
25	NDML-SS-3	6.93	10.70	47.00	49.00	60.00	19.42	42.83	0.91	3.13	6.58	11.00	3.41	227.28
26	NDML-SS-4	7.17	8.47	48.67	48.00	60.00	19.20	40.77	0.92	3.80	6.17	9.42	3.66	243.96
27	NDML-SS-5	6.83	10.30	49.60	52.33	58.67	19.77	39.73	0.87	5.37	6.97	13.33	4.53	301.98
28	NDML-SS-9	6.27	7.50	47.67	47.67	59.67	19.27	40.83	0.98	5.83	6.51	14.22	6.66	444.00
29	NDML-SS-13	5.60	7.80	45.67	46.33	54.00	18.63	37.80	0.91	3.93	4.51	7.33	3.45	229.98
30	NDML-SS-14	6.93	7.07	46.00	46.33	56.67	21.33	39.50	0.85	2.53	4.84	13.27	2.12	141.30
31	NDML-SS-15	5.57	6.20	45.00	44.33	54.00	20.13	38.50	0.86	2.60	3.84	7.42	2.25	150.00
32	NDML-SS-16	8.33	10.80	48.00	51.00	59.67	24.37	34.50	0.91	4.30	4.40	8.33	3.73	248.64
33	NDML-SS-17	7.80	8.30	45.00	44.00	54.67	22.53	40.30	0.97	1.60	5.06	7.78	1.54	102.66
34	NDML-SS-18	5.77	7.50	46.67	50.00	59.00	19.08	43.17	1.03	1.97	6.65	11.56	2.01	133.98
35	NDML-NS-6	6.93	10.90	48.33	49.33	60.33	19.73	40.47	0.91	6.67	6.26	12.58	5.78	385.26
36	NDML-NS-7	6.40	8.93	45.30	48.67	54.67	19.43	38.70	0.94	4.93	5.69	12.00	4.75	316.62
37	NDML-NS-8	7.93	11.37	46.67	49.33	58.67	21.20	37.13	0.91	4.27	4.72	13.67	3.94	262.62
38	NDML-NS-10	8.53	12.13	49.33	51.33	61.33	20.63	42.10	0.97	4.63	6.17	11.11	4.55	303.30
39	NDML-NS-11	5.30	14.37	42.67	46.33	54.00	20.07	40.17	0.88	5.13	6.61	13.86	4.44	295.98
40	NDML-NS-12	7.90	14.03	50.70	51.23	60.33	20.87	41.80	0.97	6.70	6.33	11.89	6.15	409.98
Grand Mean		**7.38**	**10.88**	**46.97**	**49.11**	**58.77**	**30.29**	**31.17**	**0.90**	**4.72**	**5.69**	**11.95**	**4.37**	**376.90**
C.V.		5.83	6.38	2.97	3.08	2.09	3.30	4.02	4.45	11.16	8.81	11.59	9.27	
S.E. m ±		0.25	0.40	0.80	0.87	0.71	0.58	0.72	0.02	0.30	0.29	0.80	0.23	
C.D. at 5%		0.70	1.13	2.27	2.46	1.99	1.62	2.04	0.06	0.86	0.81	2.25	0.66	

Table.2 The most desirable genotypes identified for 13 characters in bottle gourd

S. No	Characters	Genotypes				
		1	2	3	4	5
1	Node number to first staminate flower anthesis	NDBG-613-1	NDBG-619-6-4	NDBG-619-11-2	NDBG-619-11-3	NDBG-701
2	Node number to first pistillate flower anthesis	NDBG-613-1	NDBG-613-2	NDML-NS-11	NDML-NS-12	NDBG-619-6-4
3	Days to first staminate flower anthesis	NDML-NS-12	NDBG-619-6-4	NDBG-613-1	NDML-SS-5	NDML-NS-10
4	Days to first pistillate flower anthesis	NDML-SS-5	NDBG-613-1	NDBG-619-6-4	NDBG-613-2	NDML-SS-1
5	Days to first harvest	NDBG-613-2	NDBG-613-1	NDML-SS-1	NDML-NS-10	NDBG-601-3
6	Fruit length/polar length (cm)	NDBG-601-3	NDBG-619-6-4	NDBG-604-4	NDBG-601-2	NDBG-619-11-2
7	Fruit circumference (cm)	NDML-SS-18	NDML-SS-3	NDML-NS-10	NDML-NS-12	RDPG-NS-1
8	Fruit weight (kg)	NDML-SS-18	NDBG-601-3	NDML-SS-17	NDML-NS-10	NDML-NS-12
9	Number of fruits per plant	NDBG-619-11-2	NDBG-703	NDBG-701	NDBG-601-2	NDBG-619-11-3
10	Vine length at the time of harvest (m)	NDBG-601-3	NDBG-619-11-3	NDML-SS-5	NDBG-140	NDML-SS-18
11	Number of primary branches per vine at the time of last harvest	NDBG-601-3	NDBG-619-6-3	NDBG-613-3	NDBG-140	NDBG-619-11-3
12	Fruit yield (kg/plant)	NDBG-619-11-2	NDML-SS-9	NDML-NS-12	NDBG-701	NDBG-703
13	Fruit yield (q/ha)	NDBG-619-11-2	NDML-SS-9	NDML-NS-12	NDBG-701	NDBG-703

General mean of this trait for all genotypes was (31.17) fruit weight (kg) NDBG-613-2 (0.74) to NDML-SS-18 (1.03) General mean of this trait for all genotypes was (0.91) number of fruits/plant NDML-SS-17 (1.60) to Narendra Dharidar (8.50) General mean of this trait for all genotypes was (4.72) vine length at the time of last harvest (m) NDML-SS-15 (3.84) to NDBG-601-3 (7.30) General mean of this trait for all genotypes was (5.69) primary branches/vine at the time of last harvest, RDPG-NS-3 (6.66) to NDBG-601-3 (15.33) General mean of this trait for all genotypes was (11.95) fruit yield (kg/plant) NDBG-613-2 (1.46) to NDBG-619-11-2 (7.95) General mean of this trait for all genotypes was (4.37) fruit yield (q/ha). NDBG-613-2 (97.32) to NDBG-619-11-2 (529.92) General mean of this trait for all genotypes was (376.90) for this character and out of forty genotypes were non-significant.

In the present study to evaluate the germplasm collection the mean of forty genotypes with two checks for 13 characters is presented in Table 1. Very wide ranges of variation in mean performance of genotypes were observed for all the characters under study. The comparison of mean performance of forty genotypes with two checks for 13 traits, revealed existence of very high level of variability in the germplasm collection. The genotypes showing very high mean performance in desirable direction for various characters are listed in Table 2, which may also be used for donors for improving the characters for which they had high mean performance.

Acknowledgement

The senior author are thankful to Prof. Sheo Pujan Singh for providing facilities Department of Vegetable Science, N.D.U.A.&T. Kumarganj, Faizabad (U.P.) for providing necessary facilities.

References

Anonymous (2004). FAO website: *www.fao.org*

Dubey, (2012). Evaluation of morphologically distinct groups of bottle gourd genotypes under fusarium wilt sick plot condition. Ph.D., thesis submitted to N.D. Univ. of Agri. & Techn., Kumarganj, Faizabad. (U.P.).

Dwivedi, A. (2000). Documentation of germplasm and genetic studies in bottle gourd. (*Lagenaria siceraria* (Molina) StandL). M.Sc. (Ag.) Thesis, Department of Vegetable Science, N.D.

Dniv. of Agril. & Tech. Kumarganj, Faizabad, (U.P.).

Hawlader, M.S.H.; Haque, M.M. and Islam, M.S. (1999). Variability, correlation and path analysis in bottle gourd. *Bangladesh J. of Scientific and Indust. Res.*, 34: 50-54.

Singh, D.K. and Kumar, R. (2002). Studies on the genetic variability in bottle gourd. *Prog. Hort*., 34: 99-101.

Singh, S. P. (2012). Final Progress Report of the project entitled 'Off season cultivation of cucurbits in eastern Uttar Pradesh' Department of Vegetable Science, N.D. Univ. of Agri. & Techn., Kumarganj, Faizabad, (U.P.).

Singh, S. P. (2013). Cucurbits: Biodiversity, Breeding and production in Uttar Pradesh, Published by Uttar Pradesh state Biodiversity Board, Lucknow (U.P.) 108 p.

Singh, S.P.; Singh, N.K. and Maurya, I.B (1996b). Genetic variability and correlation studies in bottle gourd (*Lagenaria siceraria* (Mol.) Standl.). *P.K.V.J.*, 20: 88-89.

Tyagi, L.D. (1972). Variability and correlation studies in bottle gourd *(Lagenaria siceraria* (Mol.) Standl.). *Indian* J. *Hort.*, 29: 219-222.

Yadav, J.R.; Yadav, A.; Srivastava, J.P.; Mishra, G.; Parihar, N.S. and Singh, P.B. (2008). Study on variability heritability and genetic advance in bottle gourd [*Lagenaria siceraria* (Molina) Standl.]. *Prog Res.*, 3: 70-72.

How to cite this article:

Akshay Jain, S.P. Singh, Rajneesh Shukla and Sriom. 2018. Evaluation on Mean Performance in Bottle Gourd [*Lagenaria siceraria* (Molina) Standl] Genotypes. *Int.J.Curr.Microbiol.App.Sci.* 7(04): 2239-2243. doi: https://doi.org/10.20546/ijcmas.2018.704.255