Original Research Article

Performance of Bottle gourd (*Lagenariasiceraria L.)* genotypes ~~for yield under Prayagrajagro-climatic condition~~

Abstract

An experiment on the "Performance of Bottle Gourd Genotypes for Growth, Yield and Quality under prayagrajagro-climatic condition" was conducted during February to May, 2022, in field of Horticulture Research Farm, Department of Horticulture, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj (U.P.) India. ~~The results of the present investigation, regarding the performance of 10 genotypes of Bottle Gourd *i.e.* (AVT-II/2019/BOGVAR-1, AVT-II/2019/BOGVAR-2, AVT-II/2019/BOGVAR-3, AVT-II/2019/BOGVA-4, AVT-II/2019/BOGVA-5, AVT-II/2019/BOGVAR-6 RITURAJ(CHECK),GREENINDIA(CHECK), NATIONAL AGRO (CHECK), SHANKAR (CHECK) obtained from different sources evaluated forplantgrowth,yield and qualityhavebeendiscussedandinterpretedinthe light of previous. research work done in India.~~ The experiment was conducted in Randomized block design, ~~were each replicated thrice.~~ ~~From the present experimental findingitwasfoundedthat~~the genotype AVT-II/2019/BOGVAR-6 ~~was~~ recorded ~~with the~~ maximum number of female flowers (15.66), number of fruits/plant (8.88 fruits), average yield per plant (5.71 kg/plant), yield per hectare (342.44 q/ha), and also maximum benefit cost ratio (4.6).

Keywords: Performance, genotypes, bottle gourd (*Lagenariasiceraria L.)*

Introduction

Bottle gourd [*Lagenariasiceraria*L.], also called white-flowered gourd (2n=2x=22) belongs to family Cucurbitaceae and is one of the most ancient crops cultivated during summer throughout the world. The genus *Lagenaria*is derived from the word lagena, meaning the bottle.It is also known as Calabash, Doodhi and Lauki in different parts of India.Its primary centre of origin is Africa. The fossil records indicate its culture in India even before 200 B.C. It has been found wild in India, the Moluccas and Ethiopia. It has spread to western countries from India and Africa. The genus *Lagenaria*includes six species that are distributed in Africa, Indo-Malaysia andtheneotropics.Thereisonlyone cultivated species,*Lagenariasiceraria*, which is annual andmonoecious. The five other species are wild, perennial and dioecious, occurring in East Africa and Madagascar.

The seeds are rich in essential amino acids, minerals, lipids and fatty acids **(Essien *etal.*, 2013)** and are also used for oil extraction.Thefattyacidprofileshowslinoleicacidasthe mostabundant (62%) as compared to oleic (16.2%), palmitic (14.4%) and stearic (5.8%) acids.

The fruit make delicious supplement to the human diet and 100 g offruits contain nearly 96g water, 0.2g protein, 0.1g fat, 2.5g carbohydrate, 0.6g fiber, 0.5g minerals, 20mg calcium, 10mg phosphorus, 0.7mg iron, 0.3mg thiamine, 0.01 mgriboflavin and 0.2 mg niacin andenergy1.2cal. The seeds aregood sources oflipids and proteins and it contains 45% oil and 35 % protein.

Materials and Method

Experimental Site

A field experiment was conducted during ~~12th~~February 2022 to ~~28th~~May 2022. Horticulture Research Farm, Department of Horticulture,Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj (U.P.).

Experimental Material

The experiment was laid out in randomized block design (~~R.B.D.~~)

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with 3 replications ~~of bottle gourd AVT Genotypes varieties~~. Bottle gourd AVT Genotypes varieties was transplanted in the field at a spacing of 250 cm x 60 cm in the plot of 7.5 m x 3 m size. Recommended dose of fertilizers i.e., 250:100:100 @ N: P2O5: K2O kg /ha. Normal cultural practices and plant protection measures were followed during the cultivation process. Plants were selected at random from each plot of each variety as representative sample for recording the data.

Statisticalanalysis

The data recorded during the course of investigation were subjected to statistical analysisaspermethodofanalysisofvariance**(Fisher,1950)**.Thesignificanceandnon- significance of the treatment effect were judged with the help of 'f' value (variance ratio) was compared with the table value at ~~5%~~ level of significance. If calculated value exceeded then the value, the effect of considered to be significant.

Table 1: List of genotypes

Genotypes	Notation	Source
AVT-II/2019/BOGVAR–1	G1	IIVR VARANASI
AVT-II/2019/BOGVAR–2	G2	IIVR VARANASI
AVT-II/2019/BOGVAR–3	G3	IIVR VARANASI
AVT-II/2019/BOGVAR–4	G4	IIVR VARANASI
AVT-II/2019/BOGVAR–5	G5	IIVR VARANASI
AVT-II/2019/BOGVAR–6	G6	IIVR VARANASI
RITURAJ (Check)	G7	UNIQUE HYBRID SEED
GREEN INDIA (Check)	G8	GREEN INDIA HYBRID SEED
NATIONAL AGRO (Check)	G9	NAHS
SHANKAR (Check)	G10	SHANKAR SEED COMPANY

Results and Discussion

Number of male flowers

The maximum number of male flowers was recorded in the genotype AVT-II/2019/BOGVAR-6 (29.66) followed by the AVT-II/2019/BOGVAR-4 (27.66) and minimum number of male flowers was recorded in the genotype SHANKAR (CHECK VARIETY) (20.33).The results are conformity with the findings of **(Daryono*et al.* 2018).**

Number of female flowers

The maximum number of female flowers was recorded in the genotypeAVT-II/2019/BOGVAR-6(15.66) followed by the AVT-II/2019/BOGVAR-5 (13.00) and minimum number of femaleflowers was recorded in the genotype AVT-II/2019/BOGVAR-1 (8.33)**.**The results are conformity that more the female flowers get more number of fruits and it is due to the inherent character and genetic makeup of the varieties and environmental conditions it was findings of **Harika et al. (2012), Padmakshi Thakur *et al.* (2015), Poornima singh*et al.* (2020).**

Sex Ratio

The maximum male: female flowers ratio was recorded in the genotype AVT-II/2019/BOGVAR-2 (2.78) followed by the AVT-II/2019/BOGVAR-1 (2.76) and minimum male: female flowers ratio was recorded in the genotype SHANKAR (CHECK VARIETY) (1.74).Similar result for ratio of male: female flower had been reported by**Nalawadeetal.(2011),Harikaetal.(2012),Muralidharanetal.(2014) ,Uddinetal. (2014), Rambabu etal. (2017), A. husna*et al.* (2011)** in Bottle gourd.

Number of fruits per plant

The maximum number of fruits per plant was recorded in the genotype AVT-II/2019/BOGVAR-6 (8.88) followed by the RITURAJ (CHECK VARIETY) (7.63) and minimum number of fruits per plant was recorded in the genotype SHANKAR (CHECK VARIETY) (4.33).Theresults are conformity with thefindings of **(Manidhkumar*et al.* 2020),** and similar,findings are seen in **(Sushil kumar*et al.* 2018), Padmakshi Thakur *et al.* (2015)** and **(A. husna*et al.* 2011).**

Yield per plant (kg)

The maximum yield per plant was recorded in the genotype AVT-II/2019/BOGVAR-6 (5.71) followed by the GREEN INDIA (CHECK VARIETY) (5.29) and minimum yield per plant was recorded in the genotype AVT-II/2019/BOGVAR-1 (1.69).Theresultsareinagreementwiththefindingof**Sharma*etal*.(2013),Singh*etal*.(2017), (Sushil kumar*et al.* 2018), Padmakshi Thakur *et al.* (2015)** and **Kunjam et al., (2019)** in Bottle gourd.

Yield per hectare (q)

The maximum yield per hectare was recorded in the genotype AVT-II/2019/BOGVAR-6 (342.44) followed by the GREEN

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INDIA (CHECK VARIETY) (317.4) and minimum yield per hectare was recorded in the genotype AVT- II/2019/BOGVAR-1 (101.4).Theresultsareinagreementwiththefindingof**Kamal*etal.*(2012),Shinde*etal.*(2014),~~(~~Sushil~~)~~kumar*etal.*2018~~)~~,PadmakshiThakur*etal.*(2015and**Deepthi*etal.*(2016)**inBottle gourd.

Average Fruit weight (g):

The maximum Average fruit weight was recorded in the genotype GREEN INDIA (CHECK VARIETY) (1136.3) followed by the SHANKAR (CHECK VARIETY) (1006.00) and minimum Average fruit weight was recorded in the genotype AVT-II/2019/BOGVAR-1 (364.00). Thefindingsweresupportedby**Husnan*etal.*(2013),Damor*etal*(2016),Kumar*etal*(2018),**and**Mishra*etal*(2019),~~(Sushil~~**kumar*etal.*2018~~),PadmakshiThakur*etal.*(2015)** also reported more or less similar results in Bottle gourd.

Net return

ThemaximumnetincomeperhectarewasobtainedbyAVT-II/2019/BOGVAR-6i.e., 403218INRandfollowedbyGREEN INDIA (CHECK) i.e.,365658INRandtheminimum net return per hectare was obtained by AVT-II/2019/BOGVAR-6 i.e., 41658 INR

Fruit length (cm):

The maximum fruit length was recorded in the genotype GREEN INDIA (CHECK VARIETY) (39.00) followed by the SHANKAR (CHECK VARIETY) (38.00) and minimum fruit length was recorded in the genotype AVT-II/2019/BOGVAR-4 (12.00).The results are in agreement with the finding of **Kumar *et al.* (2011), Kumar *et al.* (2018),~~(Sushil~~kumar*etal.*2018~~),Padmakshi~~Thakur*etal.*(2015)anMishra*etal.*(2019)** in Bottle gourd.

Fruit diameter (cm):

The maximum fruit diameter was recorded in the genotype AVT-II/2019/BOGVAR-4(13.00) followed by the AVT-II/2019/BOGVAR-5 (12.00) and minimum fruit diameter was recorded in the genotype AVT-II/2019/BOGVAR-1(5.02).Similarresultshavebeenreported**Husnan*etal.*(2013),Damore*tal*(2016),Kumar*et al* (2018),~~(Sushil~~kumar*et al.* 2018~~),Padmakshi~~Thakur *et al.* (2015)** and **Mishra *et al*(2019)** in Bottle gourd**.**

Benefit cost ratio

AmongthedifferentbottlegourdgenotypesAVT-II/2019/BOGVAR-6 hasthehighest cost benefit ratio (4.6) followed by GREEN INDIA (CHECK) i.e. (4.3) and the minimum cost benefit ratio was showed byAVT-II/2019/BOGVAR-6i.e.(1.3).

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Table 2. Genotypes evaluation of bottle gourd with respect to Yield parameters

Genotype	Number of male flowers	Number of female flowers	Sex ratio	Number of fruits per plant	Yield per plant (kg/plant)	Yield per hectare(q/ha)	Average Fruit Weight (g)	Fruit diameter (cm)	Fruit length (cm)
AVT-II/2019/BOGVAR-1	23.00	8.33	2.76	4.66	1.69	101.4	364.00	5.02	24
AVT-II/2019/BOGVAR-2	26.00	9.83	2.78	5.77	2.75	165.00	478.00	5.09	27
AVT-II/2019/BOGVAR-3	27.66	11.66	2.37	5.10	2.76	165.6	543.00	6.02	31
AVT-II/2019/BOGVAR-4	27.66	12.00	2.3	6.18	3.66	219.6	593.00	13	12
AVT-II/2019/BOGVAR-5	25.66	13.00	1.97	6.10	3.89	233.4	638.0	12	12.5
AVT-II/2019/BOGVAR-6	29.66	15.66	1.89	11.21	7.24	434.44	646.0	5.05	36
RITURAJ (Check)	26.66	11.66	2.28	7.62	4.26	255.6	565.00	6.03	30
GREEN INDIA (Check)	25.33	12.00	2.11	4.66	5.29	317.4	1136.3	7.05	39
NATIONAL AGRO (Check)	22.64	8.66	2.61	4.86	3.76	225.6	775.00	7.09	33
SHANKAR (Check)	20.33	11.66	1.74	6.59	6.62	397.2	1006.0	7.02	38
F-Test	S	S	S	S	S	S	S	S	S
SE.d(+)	1.82	1.07	0.16	0.58	0.28	1.71	1.06	0.55	0.92

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C.D at 5%	3.82	2.25	0.35	1.22	0.60	3.60	2.22	1.15	1.93
C.V	8.77	11.49	8.82	12.10	9.16	0.92	0.19	9.17	3.98

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Conclusion

The results from the present investigation concluded that Bottle gourdGenotype AVT-II/2019/BOGVAR-6 was recorded maximum number of female flowers (15.66), number of fruits per plant(8.88fruits),average yield per plant (5.71kg/plant), average yield per hectare(342.44 q/ha), and maximum Benefit Cost ratio (4.6) which was found more productive and economically viable.

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