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EVALUATION OF BOTTLE GOURD GENOTYPES (*LAGENARIA SICERARIA*) FOR VARIOUS YIELD AND MATURITY CHARACTERS

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Abstract

The present investigation was carried out at the Vegetable Research Farm Department of Vegetable Science, Kalyanpur, Chandra Shekhar Azad University of Agriculture & Technology, Kanpur during Kharif season 2016 to evaluate yield and maturity characters of different 52 genotypes of bottle gourd. Yield and maturity characters were days of male flowering, days of female flowering, length of vine, number of branches/vine, fruit yield/plot, number of fruits per plot, fruit yield per plant (Kg). Results of experiment revealed that genotype BGL-4 possess maximum number of fruits per plot and fruit yield per plant (Kg) and number of branches/vine but maximum fruit yield per plot was found in BGL-11. Genotype KBGL-29 possess maximum days of male flowering, days of female flowering, length of vine and maximum number of nodes per vine was found in genotype BGL-62. Minimum days of male flowering and days of female flowering was found in genotype BGL-2. Minimum number of fruits per plot and length of vine was found in BGL-6 and BGL-45, respectively. Minimum number of branches/vine, fruit yield/plot and fruit yield per plant (Kg) was found in genotype BGL-76 (P.N.). It could be concluded from results that genotype fruit yield per plant was maximum in genotype BGL-4.

***Keywords*:** Bottle gourd, yield characters and maturity characters, genotypes and fruit yield.

Introduction

The importance of vegetable in human diet is well known since time immemorial as they supply all main components of human diet (Trichopoulou *et al*., 1997). Vegetable contain carbohydrate, protein, minerals, Vitamins and also possess medicinal properties. Thus, vegetables play a vital role in the balanced diet of human being (Asif, 2011). Bottle gourd [*Lagenaria siceraria* (Mol.) Standl.] is an important gourd having wide range of uses and is largely cultivated in the tropics and subtropics for its edible fruits. Tender fruits are used as vegetable and also for preparation of sweets and pickles especially in the hills. It has cooling effect and prevents constipation and has diuretic and cardio-tonic properties. Fruit pulp is used as antidote against certain poisons.

In spite of being in cultivation since ancient times and the presence of the wide germplasm, conscious evaluation and exploitation of germplasm has not been attended to until recently (Harika *et al*., 2012). Thousands of years of cultivation of this vegetable with its cross-pollinated nature has resulted in a large variation for several quantitative and qualitative characters. But, unfortunately, very little attention has been paid for genetic up gradation of this crop. It has been well documented that effectiveness of the selection in a crop under plant improvement program is mainly dependent on the greater the genetic diversity in population, more the genetic potentiality and thereby wider is the scope for the improvement of the crop (Sharma, 1997; Dubey *et al.,* 2019). Collection and evaluation of germplasm is a pre-requisite for their utilization and detailed evaluation determines the potential of an accession in specific crop improvement programme (Munshi and Acharyya, 2005). Therefore, a trial for characterization and evaluation of presently available bottle gourd germplasm is carried out in order to identify the potential cultivar for different yield and maturity characters.

Materials and Methods

The study was carried out at the Vegetable Research Farm Department of Vegetable Science, Kalyanpur, Chandra Shekhar Azad University of Agriculture and Technology, Kanpur during Kharif season 2016. Fifty & Two genotypes of bottle gourd [*Lagenaria siceraria* (Mol.) Standl] with wide genetic diversity were obtained from the Department of Vegetable Science, Kalyanpur, Chandra Shekhar Azad University of Agriculture & Technology, Kanpur. The experiment was laid out in the randomized block design with three replications. Row distance was 3 meters with planting distance of 50 cm. Trial comprise 52 trains/lines were laid out in Randomized Block Design (RBD) with three replications and evaluated for the yield and maturity characters and the mean values of the data recorded were analyzed statistically adopting the method suggested by Panse and Sukhatme (1985).

Observation recorded

Three plants were randomly taken from middle row of each plot in each replication and tagged them. The data were recorded on the tagged plants for the following Characters:

1. **Days to first male flowering:** It was recorded by counting the days from date of sowing to the opening of the first male flower bud.

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2. **Days to first female flowering:** It was recorded by counting the days from date of sowing to the opening of the first female flower bud.
3. **Length of vine:** Length of vine was measured from the base to top of the plant after last picking.
4. **Number of branches:** The number of branches was counted on each vine of the plant during observation Averaged data were computed for further analysis.
5. **Weight of fruit per plot:** The harvested fruit from each picking of whole plot were weighed by single pan balance for weight of fruit per plot.
6. **Number of fruits per plot:** The harvested fruits were counted in the individual treatment in each plot at the time of each picking.
7. **Fruits yield per plant:** The average yield per plant of edible fruits in kg was recorded. The total yield from all picking divided by number of plants.

Results and Discussion

Days of male flowering: There was significant difference between days to male flowering among genotypes. Data present in table 1 revealed that maximum value (2.547) for days to male flowering was in genotype KBGL-29 and minimum value (0.800) was in BGL-2 which was at par with BGL-6, BGL-33, BGL-42 and BGL-76 (P.N.). The results are in agreement with that of Kumar *et al*. (1999) in bottle gourd

Days to female flowering: There was significant difference between days to female flowering among genotypes. Data present in table 1 revealed that maximum value (12.733) for days to female flowering was in genotype KBGL-29 which was at par with BGL-67 and minimum value (4.000) was in BGL-2 which was at par with genotype BGL-76, BGL-67, BGL-45, BGL-42, BGL-31, BGL-33, BGL-1, BGL-4, BGL-6, BGL-8, BGL-9 and KLG. The results are in agreement with that of Sirohi *et al*. (1988) in bottle gourd.

Length of vine: There was significant difference between lengths of vine among genotypes. Data present in table 1 revealed that maximum value (18.667) for length of vine was in genotype KBGL-29 which was at par with BGL-67 and minimum value (7.333) was in BGL-45 which was at par with genotype BGL-1, BGL-2, KLG, BGL-4, BGL-6, BGL-9, BGL-10, BGL-13, BGL-19, BGL-28, BGL-31, BGL-33, BGL-36, BGL-38, BGL-42, BGL-46, BGL-51, BGL-53, BGL-54, BGL-57, BGL-59, BGL-63, BGL-64, BGL-71 and BGL-76 (P.N).

Number of branches: There was non-significant difference between number of branches among genotypes. Data present in table 1 revealed that maximum value (8.343) for number of branches was in genotype BGL-4 and minimum value (6.000) was in BGL-76 (P.N).

Weight of fruit per plot: There was significant difference between weight of fruit per plot among genotypes. Data present in table 1 revealed that maximum value (7.667) for weight of fruit per plot was in genotype BGL-11 which was at par with BGL-1, BGL-2, KLG, BGL-6, BGL-29, BGL-35, BGL-53, BGL-58, BGL-67 and Azad Harit and minimum value (2.333) was in BGL-76 (P.N) which was at par with genotype BGL-36, BGL-39 and BGL-47.

Number of fruits per plot: There was significant difference between number of fruits per plot among genotypes. Data present in table 1 revealed that maximum value (52.333) for number of fruits per plot was in genotype BGL-4 which was at par with BGL-1, BGL-2, KLG, BGL-12 and BGL-13 and minimum value (38.000) was in BGL-6 which was at par with genotype BGL-19, BGL-29, BGL-37, BGL-52, BGL-53, BGL-70, BGL-71 and KBGL-29. The results obtained are in agreement with Saurabh *et al.,* 2017a; Samadia (2002); Ambesh *et al.,* 2017b; Tomar, 2020; Sharma and Dhankar (1999) in bottle gourd

Fruits yield per plant: There was significant difference between fruits yield per plant among genotypes. Data present in table 1 revealed that maximum value (57.000) for fruits yield per plant was in genotype BGL-4 which was at par with BGL-1, BGL-2, KLG, BGL-5, BGL-10, BGL-11, BGL-12, BGL-13, BGL-32, BGL-33, BGL-34, BGL-55, BGL-64 and minimum value (31.333) was in BGL-76 (P.N).

Conclusion

It could be concluded that from results that best genotype for fruit yield per plant and number of fruits per plot was BGL-4. KBGL-29 genotype is early in days to male and female flowering over other genotypes.

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Table 1: Mean performance of genotypes for eight yield and maturity characters in bottle gourd

Source of variance	Days of male flowering	Days to female lowering	Length of vine	Number of branches/plant	Fruit yield/plot	Number of fruit/plot	Fruit yield/plant
BGL-1	0.853	4.267	8.333	7.793	6.667	48.667	53.000
BGL-2	0.800	4.000	9.000	7.873	7.000	50.667	53.000
KLG	0.940	4.700	8.000	7.957	7.333	50.000	53.333
BGL-4	1.107	5.667	8.667	8.343	5.333	52.333	57.000
BGL-5	1.900	9.500	10.333	7.677	6.333	46.333	49.667
BGL-6	1.007	5.033	9.333	7.427	5.667	38.000	41.667
BGL-8	1.093	5.467	10.000	6.927	5.000	45.000	47.667
BGL-9	0.867	4.333	7.667	7.243	6.000	44.000	48.667
BGL-10	1.147	5.733	7.667	7.557	6.000	44.667	50.667
BGL-11	1.547	7.733	11.667	7.800	7.667	45.333	51.000
BGL-12	1.653	8.267	12.667	7.913	6.333	48.333	54.333
BGL-13	1.140	5.700	8.000	7.633	6.333	49.333	53.000
BGL-18	1.840	9.200	12.333	7.167	5.333	44.000	47.333
BGL-19	1.280	6.400	8.667	7.927	7.333	42.000	46.333
BGL-28	1.233	6.167	8.667	7.450	6.000	43.333	47.667
BGL-29	1.807	9.033	14.000	7.393	5.667	41.667	46.333
BGL-30	1.633	7.167	10.667	7.903	6.333	44.000	49.333
BGL-31	0.823	4.117	7.667	7.213	6.333	44.667	49.000
BGL-32	1.373	6.867	10.667	7.997	6.667	47.000	51.667
BGL-33	1.053	5.400	8.667	7.123	5.000	50.667	54.667
BGL-34	1.747	8.733	13.000	7.527	6.000	46.000	51.333
BGL-35	1.553	7.767	11.000	7.053	5.667	43.667	46.667
BGL-36	1.427	7.800	8.667	7.273	4.333	43.333	47.000
BGL-37	1.620	7.933	12.667	7.083	6.000	41.000	47.000
BGL-38	1.337	6.683	8.667	8.090	6.667	42.667	48.000
BGL-39	1.980	9.900	13.000	6.883	4.000	43.333	47.333
BGL-42	1.060	5.300	7.667	7.560	7.333	42.667	45.333
BGL-45	0.853	4.267	7.333	8.117	6.667	42.667	46.333
BGL-46	1.207	6.033	9.000	7.297	4.667	43.667	47.667
BGL-47	1.373	6.867	12.000	6.760	4.333	44.000	49.333
BGL-51	1.333	6.667	9.333	6.880	5.000	43.333	45.667
BGL-52	1.280	6.400	10.333	7.900	6.333	42.333	47.333
BGL-53	1.200	6.000	9.333	6.953	5.667	41.333	46.333
BGL-54	1.140	5.700	9.667	8.090	7.333	44.667	47.000
BGL-55	1.733	8.667	12.667	7.657	6.333	46.333	50.667
BGL-57	1.160	5.800	8.000	7.860	6.000	44.667	46.000
BGL-58	1.807	9.033	13.000	7.553	5.667	43.667	46.333
BGL-59	1.173	5.867	8.667	7.140	5.333	43.333	48.333
BGL-60	1.333	6.667	10.667	8.130	7.333	44.333	48.000
BGL-62	1.300	6.500	10.667	8.147	6.333	44.667	48.000
Azad harit	2.047	10.233	13.667	7.427	5.667	43.000	48.000
BGL-63	1.233	6.167	9.333	7.630	6.667	44.333	48.667
BGL-64	1.280	6.400	9.667	7.203	5.333	44.333	49.667
BGL-65	1.247	6.233	10.667	7.517	6.333	41.667	46.000
KBGL-29	2.547	12.733	18.667	8.110	7.333	42.333	47.000
BGL-67	2.277	11.383	16.333	7.537	5.667	44.000	46.000
BGL-68	1.227	6.133	10.333	7.863	6.667	45.000	47.667
BGL-69	1.373	8.067	10.000	7.767	7.000	44.667	48.333
BGL-70	1.660	8.300	11.000	7.270	5.000	42.333	47.000
BGL-71	1.433	7.167	9.667	7.780	7.000	42.333	47.333
BGL-73	1.900	9.500	13.000	7.517	5.000	43.000	46.667
BGL-76 (P.N)	1.047	5.233	8.000	6.000	2.333	46.000	31.333
C.D.	0.292	1.569	2.418	N/A	2.062	4.342	7.493
SE(m)	0.104	0.559	0.861	30.626	0.734	1.546	2.667
SE(d)	0.147	0.790	1.217	43.312	1.038	2.186	3.772