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Screening of cape gooseberry selections based on growth characteristics and fruit yield

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Abstract

A field trial was carried out to screen cape gooseberry selections based on plant growth characteristics and fruit yield. The data obtained showed significant variation for the growth characteristics and fruit yield in different selections. Maximum plant height (103.16 cm) and plant spread (176.13 cm) was recorded in selection 7. Maximum number of main and lateral branches were found maximum in selection 3(6.67) and selection 2 (16.00), respectively. Maximum stem thickness (13.98 mm), number of leaves per branch (58.67) and fruit yield per plant (3.64 kg/plant) were recorded in selection 9, selection 17 and selection 23, respectively.

Keywords: Cape gooseberry, growth characteristics, yield

Introduction

Cape gooseberry (*Physalis peruviana* L.), is a minor fruit in India and have unique flavour, texture and colour is rich in many beneficial compounds and play an important role in nutrition. Fruit is rich in pro-vitamin A, ascorbic acid, and in some vitamins of the B complex. Fruit is also anti-asthmatic and antiseptic. This fruits represents an alternative for the production sector in many countries including India, creating a positive economic impact due to the good perspectives and interest of the worldwide trade for fruits and berries, and the demand from consumers for fruits that have good nutritional and medicinal properties. Lot of variations exist in cape gooseberry. As genetic variation is indispensable for effective management and use of genetic resources, conservation of genetic resources is important to meet the demand for future food security and also the introduction of improved exotic cultivars may result in the complete elimination of some available germplasm in years to come. This crop deserves special attention in view of its quick growing habit and having delicious fruits. Although some studies are being conducted on cape gooseberry in some parts of country, the information on this berry is still scarce. Keeping in view the above facts and importance, present investigation was conducted to screen some cape gooseberry selections based on growth characteristics and fruit yield.

Materials and Methods

The present investigation was carried out for two consecutive years in the experimental orchard of Division of Fruit Science, SKUAST-K, Shalimar, Srinagar (J&K). Twenty five cape gooseberry selections were evaluated for plant growth characteristics and fruit yield. The experiment was carried out in a complete randomized block design with three replications having five plants per replication. Plant height of different plants in each replication was recorded at the end of growing season, using measuring tape from ground level to highest tip of the plant and their mean value was expressed centimetres. The plant spread was recorded in two directions i.e. East-West and North-South at the maximum width of plant with the help of a measuring tape and mean values of both directions were taken and expressed in centimetres. Number of main branches, lateral branches and number of leaves per branch were counted in each plant in every replication and their mean value was calculated. Stem thickness in each plant of all the replications was measured with the help of vernier calliper at the end of growing season and expressed in mm. Fruit yield of all the selections in each replication was recorded by weighing all the fruits from each plant and the mean value was calculated and expressed in Kg per plant. The data generated was subjected to statistical as per the procedures described by Cochran and Cox (1963) [2].

Results and Discussion

Data presented in Table 1 clearly showed significant difference among cape gooseberry selections for plant height and spread and number of main and lateral branches. Plant height in different selections varied from 39.51cm (selection 16) to 103.16cm (selection 7). Variation in plant height in different selections may be due to the genetic behaviour of the plant. Similar findings were also reported by Singh *et al.* (2011)^[6], Ali and Singh (2016)^[1] and Singh *et al.* (2014)^[5]. Significant variation was also observed in plant spread among the different selections under investigation. Plant spread varied from 52.53 cm (selection 16) to 176.13 cm (selection 7). These results are in conformity with the findings of Ali and Singh (2016)^[1]. Number of main branches for different selections also showed significant and wide range of variation and it varied from 3.00 in selection 2 to 6.67 in selection 3 however lateral branches were highest (16.0) in selection 2 and lowest (7) in selection 21. These parameters determine the vigour of the plant and the results are in conformity with the findings of Singh *et al.* (2014)^[5] and Gulpinder and Amarjeet (2015)^[4].

Table 1: Mean performance of different cape gooseberry selections for different growth characteristics (pooled data for two years).

Selection	Plant height (cm)	Plant spread (cm)	No. of main branches	No. of lateral branches
1	73.57	143.27	4.00	15.00
2	84.33	140.17	3.00	16.00
3	96.33	154.76	6.67	9.00
4	88.89	149.38	4.33	9.67
5	94.26	160.00	4.67	9.33
6	77.15	125.35	4.33	9.00
7	103.16	176.13	5.00	7.67
8	93.71	153.73	3.00	7.67
9	56.31	84.29	4.67	9.33
10	47.47	76.77	4.33	9.00
11	58.12	96.36	5.00	9.67
12	51.19	86.94	4.67	10.00
13	60.56	98.14	5.00	10.33
14	45.09	69.88	4.33	9.33
15	58.09	93.73	5.33	11.33
16	39.51	52.53	3.33	10.00
17	47.67	71.57	5.33	11.33
18	44.41	64.70	3.67	11.00
19	62.52	96.15	5.33	9.67
20	50.30	78.07	4.67	9.67
21	41.66	59.42	3.67	7.00
22	42.28	61.51	4.33	9.33
23	69.59	109.34	6.33	11.67
24	54.73	84.74	5.67	10.33
25	51.05	79.96	4.67	9.00
CD _(0.05)	13.92	30.49	1.31	2.78

Data presented in Table 2 clearly reveals significant difference in stem thickness, number of leaves and fruit yield per plant in different cape gooseberry selections. Stem thickness in different selections ranged from 7.04 mm to 13.98 mm. Maximum stem thickness was recorded in selection 9 (13.98 mm) followed by selection 23 (10.21mm) whereas stem thickness was minimum in selection 13 (7.04 mm). Number of leaves per branch ranged from 30.67 to 58.67. More number of leaves per branch was recorded in selection 17 (58.67) followed by selection 15 (57.33). However least number of leaves were recorded in selection 2 (30.67). Parameters recorded depend on the vigour of the plant and results are in conformity with the findings of Singh *et al.* (2014)^[5] and Singh *et al.* (2011)^[6]. Mean performance

of different cape gooseberry selections for the fruit yield per plant clearly showed the significant difference and ranged from 1.20 kg per plant to 3.64 kg per plant. Highest fruit yield was recorded in selection 23 (3.64 kg per plant) followed by selection 1 (2.93 kg/plant) and selection 2 (2.92 kg/plant). However lowest fruit yield (1.20 kg/plant) was recorded in selection 25. Variation in fruit yield may be due to the genetic behaviour of individual selection and the results are in line with the findings of Gulpinder and Amarjeet (2015)^[4], Singh *et al.* (2011)^[6] and Fischer *et al.* (2011)^[3].

Table 2: Mean performance of different cape gooseberry selections for different growth characteristics and fruit yield (pooled data for two years).

Selection	Stem thickness (mm)	No. of leaves per branch	Fruit yield (Kg/plant)
1	9.78	33.33	2.93
2	9.58	30.67	2.92
3	8.62	47.00	2.59
4	8.61	51.00	2.48
5	8.77	56.00	2.69
6	8.20	43.33	2.22
7	7.27	55.67	1.26
8	8.29	44.00	2.36
9	13.98	37.33	1.91
10	9.34	39.67	2.49
11	9.24	43.00	2.19
12	8.64	52.67	1.39
13	7.04	46.33	2.61
14	7.34	45.67	2.39
15	8.15	57.33	1.48
16	8.21	57.00	1.40
17	8.23	58.67	1.50
18	8.61	48.67	1.50
19	8.83	39.67	1.57
20	8.71	37.33	1.46
21	8.09	35.00	1.32
22	9.26	45.67	2.12
23	10.21	53.33	3.64
24	9.08	45.67	1.75
25	8.59	44.00	1.20
CD _(0.05)	3.90	14.25	0.47

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