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Performance of strawberry cultivars under Mahabaleshwar conditions

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Abstract

Strawberry (*Fragaria* sp) is native of temperate regions but varieties are available which can be cultivated in subtropical climate. In recent years strawberry is being successfully cultivated in plains of Maharashtra around Pune, Nashik and Sangli. Strawberry is grown in autumn and summer season at Mahabaleshwar. A wide range of varieties are being grown. A trial was conducted during 2016-2017 to evaluate the performance of cultivars mainly Camerosa, Winter Dwan, Nabila and Seascape. The experiment was laid out in randomized block design with four treatments and five replications. Observations were recorded on different vegetative characters like plant height (cm), plant spread (cm) and reproductive characters like number of fruits/plant, fruit weight, yield / plant, yield/ ha, TSS and harvesting duration in days. The Cv. Seascape recorded minimum height (22.9 cm), fruit weight (24.40 g) and yield / plant (839 g) and yield / ha (33.55 MT) however, it was statically at par with the Cv. Winter Dwan and Nabila. The Cv. Nabila recorded the highest plant height (30.80 cm) while the cultivar Winter Dwan recorded significantly the maximum East - West (35.92 cm) and North - South (33.92 cm) spread which was found on par with cultivar Camerosa (32.92 and 31.28 respectively) and Nabila (32.00 cm in respect of North - South spread).

Keywords: strawberry, cultivars performance

Introduction

The cultivated strawberry (*Fragaria x ananassa* Duch.) is one of the soft fruits of the world. It is a hybrid of two Native American species; *Fragaria chiloensis* and *Fragaria virginiana*, belongs to the Rosaceae family. Botanically it is an aggregate fruit which is highly perishable in nature. It is native of temperate regions, however, varieties which can be cultivated in subtropical climate are available. In India it is cultivated in the hills. Its main center of cultivation are Nainital and Dehradun districts in Uttaranchal, Mahabaleshwar in Maharashtra, Kashmir Valley, Bengaluru and Kalimpong in West Bengal. In recent years, strawberry is being cultivated successfully in plains of Maharashtra a round Pune, Nashik and Sangli towns. The strawberry is among the most widely adopted small fruit crops of the country. Strawberry is grown throughout Europe, in every United States as well as Canada and South America. The wide variation in climate within these regions and the wide adaption of the strawberry plants permit harvesting and marketing the fruits during greater part of the year.

This soft fruit is having a distinct tantalizing aroma (Sharma and Yamdagni, 2000) [12]. It is highly nutritious with abundant source of vitamins A, B, C and niacin, minerals like phosphorus, potassium, calcium and iron (Karkara and Dwivedi, 2002) [6]. It is utilized for the production of purees, juice concentrate, jams, preserves and rose red wine. Medicinally, strawberries have been known for its anti viral properties against polio, these may block the formation of nitosamines, which can cause cancer, furthermore these contain relatively high quantities of ellagic acid, which has a wide range of biological activities (Rieger, 2006) [10]. The wide diversity of strawberry plant gives an idea of its potential for selection work. Choice of cultivars is of paramount importance for successful strawberry cultivation (Asrey and Singh, 2004; Ahsan *et al.* 2014) [2, 1]. Selection of new stable strawberry cultivars for field condition can ensure better yield and quality. Considering above facts the present study work was undertaken with a view to evaluate the performance of different strawberry cultivars at Mahabaleshwar.

Materials and Methods

The present investigation was conducted at RWRRS, Mahabaleshwar, Dist Satara, Maharashtra during 2016 -17 with an objective to evaluate the performance of strawberry cultivars *viz.* Camerosa, Winter Dwan, Nabila and Seascape. Vigorous, healthy, free from diseases,

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insect-pest and well rooted plants were selected for planting. The seedlings were planted in November 2016. A unit of twenty runners comprising a treatment was planted in each replication at spacing of 30 X 30 cm on the raised beds taking care that the crown of the runners lies just at the surface of soil. All plants were kept with uniform cultural practices, i.e. fertigation, irrigation etc.

The experiment was laid out in randomized block design with four treatments and five replications. Five random competitive plants were selected from each replication and observations were recorded. The average value of each observation was calculated on the basis of five plants for each cultivar in every replication. Average plant height and plant spread were recorded in centimeter with the help of meter scale. Total number of fruits per plant, average fruit weight in gram was computed and yield of fruit per plant was recorded. The yields per hectare in tons were recorded by yield per plant multiplied with total number of plant per hectare. Data pertaining to fruit weight were recorded at each harvest and average was taken after completion of all harvests. These data were subjected to statistical analysis following standard procedures (Panse and Sukhatme, 1985) [9].

Results and Discussions

Plant height

The varietal differences for average plant height were significant and presented in Table 1. The Cv. Nabila recorded significantly maximum plant height (30.80 cm). The minimum plant height (22.92 cm) was exhibited by Cv. Seascape. These differences are due to their genetical makeup, which resulted differently for plant height. Neetu and Sharma (2018) [8] also reported that cv Nabila recorded maximum plant height (25.39 cm) which was at par with Cv. Camarosa (23.21 cm) and Cv. Flaminia (22.96 cm), whereas minimum plant height was recorded in Cv. Rania (18.23 cm).

Plant spread

The differences for East- West and North – South spread were found significant among the varieties (Table 1). The highest East- West plant spread (35.52 cm) was found in Cv Winter Dawn which on par with Cv. Camarosa (32.92 cm). The minimum East- West spread (23.96 cm) was noticed in Cv. Seascape. The highest North – South plant spread (33.92 cm) was found in Cv Winter Dawn which on par with Cv. Nabila (32.00 cm) and Cv. Camarosa (31.28 cm). The minimum North – South spread (25.60 cm) was exhibited by Cv. Seascape. The above finding comes in accordance with the findings of Singh *et al.*, (2008) [14], Sharma *et al.*, (2014) [12] and Neetu and Sharma (2018) [8].

No. of fruits/ plant

The data presented in Table 1 showed significant differences for number of fruits harvested / plant. The Cv. Winter Dawn recorded maximum fruits / plant (39.20) which was on par with Cv. Nabila (37.28). The Cv. Camarosa recorded minimum fruits / plant (31.76). Neetu and Sharma (2018) [8] also reported that Cv Nabila recorded maximum number (24.71) of fruits/plant which were on par with Cv. Camarosa (23.10), while Cv. Rania recorded minimum (18.84) fruits/plant. These results are in accordance with findings obtained by Baumann *et al.*, (1993) [3] and Belakhud *et al.*, (2015) [4].

Fruit weight (g)

The heaviest fruits were harvested from Cv. Seascape with average fruit weight of 24.40 g which was on par with Cv. Winter Dawn (21.00 g) and Cv. Nabila (19.64 g). The minimum fruit weight (17.00 g) was recorded by Cv. Camarosa. According to Morgan (2006) [7], the final size and shape of the berry depend on the number of achenes formed, which is determined by pollination and fertilization during blooming. These results are in line with findings obtained by Das *et al* (2015) [5] and Neetu and Sharma (2018) [8].

Yield

The Cv. Seascape recorded maximum yield (0.839 kg/ plant and 33.55 Mt/ha) which was on par with Cv. Winter Dawn (0.824 kg/ plant and 32.97 Mt/ha) and Cv. Nabila (0.735 kg/ plant and 29.42 Mt/ha). Minimum yield (0.541 kg/ plant and 21.65 Mt/ha) was recorded in Cv. Camarosa.

The Cv. Seascape recorded maximum yield, this was due to the maximum flowering and fruits with greater weight. The result are accordance with finding of Belakhud *et al.*, (2015) [4] who reported that the maximum fruit yield per plant in Chandler (616.00 g) whereas the minimum fruit yield per plant was reported in Addie (90.00 g).

TSS

The significantly maximum TSS (12.46 %) was recorded by Cv. Nabila. The lowest TSS (9.80 %) was noticed in Cv. Camarosa. These results are in confirmation with findings obtained by Saima *et al* (2014) [11].

Harvesting Duration

The varietal differences for harvesting duration were non significant (Table 1). However, Cv. Camarosa recorded minimum harvesting duration (70.80 days after planting) and Cv Nabila recorded late harvest (77.80 days after planting). These results are in line with Neetu and Sharma (2018) [8].

Table 1: Performance of different strawberry cultivars at Mahabaleshwar (2016)

Treatments	Varieties	Plant Height (cm)	EW Spread (cm)	NS Spread (cm)	No. of fruits/plant	Fruit weight (g)	Yield/ plant (kg)	Yield / ha. (MT)	TSS (%)	Harvest duration (DAP)
T ₁	Camarosa	27.92	32.92	31.28	31.76	17.00	0.54	21.65	9.80	70.80
T ₂	Winter Dawn	27.20	35.52	33.92	39.20	21.00	0.82	32.97	11.10	74.80
T ₃	Nabila	30.80	31.68	32.00	37.28	19.64	0.73	29.42	12.46	77.80
T ₄	Seascape	22.92	23.96	25.60	34.44	24.40	0.84	33.55	10.44	73.20
SE ±		0.91	0.93	1.21	0.72	1.62	0.06	2.48	0.59	2.84
C.D. at 5 %		2.82	2.91	3.77	2.23	5.08	0.19	7.73	1.83	N.S.
C. V. %		7.45	6.73	8.82	4.49	17.76	18.87	18.87	12.00	8.58

Conclusion

From present investigation it can be concluded that though cultivar Seascape have average growth, produced maximum

fruits yield with heavier fruits. The Cv. Seascape is an appropriate commercial strawberry cultivar for Mahabaleshwar hilly region of Maharashtra.

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