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Performance of different strawberry (*Fragaria x ananassa* Duch.) cultivars for yield, yield attributing parameters and benefit: Cost ratio under farmer's field condition (Baadi) in the plain region of Chhattisgarh

Gowardhan Kumar Verma, SP Sharma, HK Panigrahi and Sangeeta

Abstract

Strawberry (*Fragaria x ananassa* Duch.) is one of the most important soft fruit belongs to the family Rosaceae. It is mainly a temperate region fruit crop but also can be grown in tropical and sub-tropical climatic region due to availability of day neutral and thermo-insensitive varieties. A research trial was conducted in three farmer's field condition (Baadi) at village-Bharregaon, (dist.-Rajnandgaon, Chhattisgarh) and the research farm of College of Horticulture and Research Station, Rajnandgaon (C.G.) during the winter spring season of the year 2017-18 to evaluate different strawberry cultivars for yield, yield attributing parameters and benefit: cost ratio under farmer's field condition (Baadi) in the plain region of Chhattisgarh. The experiment was conducted with two best performing strawberry cultivars namely Nabila and Camarosa replicated four times using student's t-test. Result revealed that regarding yield and yield attributing parameters, cv. Nabila recorded maximum number of fruits per plant (37.32), fruit weight (23.90 g/fruit), fruit length (5.35 cm), fruit diameter (3.25 cm), fruit yield (745.33 g/plant), fruit yield (361.40 q/ha) and maximum benefit: cost ratio (4.06), while the minimum was recorded in cv. Camarosa.

Keywords: Strawberry, evaluation, farmer's field condition, yield, yield attributing parameters, benefit: cost ratio etc.

Introduction

The cultivated strawberry is one of the luscious and soft fruits of the world. It is a native of France and belongs to the family Rosaceae. Botanically it is an aggregate fruit which is highly perishable in nature. In temperate climate condition, its plants behave like a small perennial herb whereas in sub-tropical climate it behaves as annuals. Also known as wholesome fruit having 98 % edible portion with maximum fruit weight and size.

It exhibits high level of anti-oxidant capacity and higher level of minerals like phosphorus, potassium, calcium, iron and especially vitamin C (40-100mg/100g fruit), vitamin B, proteins, which make it ideal for health-conscious consumers. Strawberry contains 87.8 percent water, 0.7 percent protein, 0.2 percent fat and 0.3 percent iron in 100g of fresh fruit which provides approximately 30 calories of energy. Strawberries have traditionally been a popular delicious fruit for its flavour, taste, fresh use, freezing and processing. It is in high demand for table purpose as well as for Jam making, canning, ice-cream preparation, beverages, wine, soft drinks and other quality products.

Fourteen cultivars of strawberry have been evaluated at College of Horticulture and Research Station, Pendri Farm, Rajnandgaon in the year 2017-18. Among which two cultivars *i.e.*, Nabila and Camarosa were found most suitable cultivars for this region in respect of fruit weight, yield and yield attributing parameters and quality parameters of fruit (Sharma, 2017)^[9]. This is first time that cultivars of strawberry will be evaluated at farmer's field condition. New initiatives are essentially required for increasing farmer's income. Introduction of new fruit crops in sub-tropics are the prime need to increase the farmer's income, employment generation to support livelihood in addition to nutritional security. In this direction the effort is being initiated to introduce strawberry cultivation among farming communities at their own fields.

The work on varietal evaluation was not done earlier in Chhattisgarh plain region under farmer's field (Baadi condition), therefore, the present study was conducted to evaluate best performing strawberry cultivars under farmer's field condition for yield, yield attributing

parameters and benefit: cost ratio of strawberry cultivation.

Methods and Materials

The field trial was carried out during the winter spring season of the year 2017-18 in three farmer's field (Baadi condition) at village-Bharregaon (dist.-Rajnandgaon, Chhattisgarh) and the research farm of College of Horticulture and Research Station, Rajnandgaon (C.G.). The soil of experimental field was sandy-loam having pH 7.7. In the experiment student's t-test was used with 4 replications. The experiment was conducted with 2 cultivars viz. Nabila and Camarosa. Healthy Tissue cultured plants were procured from Mahabaleshwar (Maharashtra). The vigorous, healthy, diseases & pest free and well rooted saplings of all 2 varieties of Strawberry were planted in field at 45 cm x 30 cm distance with application of recommended dose of fertilizers. All the experimental plants were uniformly maintained and same cultural practices were provided i.e., fertilization, irrigation and plant protection measures during whole period of investigation. Under yield and yield attributing parameters the observations i.e., number of fruits per plant, fruit weight (g), fruit length (cm), fruit diameter (cm), fruit yield (g/plant), yield (q/ha) and benefit: cost ratio were recorded and data were analyzed statistically. Fruit length and diameter was measured with the help of Vernier calipers, fruit weight and yield were recorded using digital weighing balance.

Results and Discussion

The results of trial pertaining to yield, yield attributing parameters and benefit: cost ratio is summarized as follows:

Yield and yield attributing parameters

Number of fruits per plant

The data gathered on number of fruits per plant was very much influenced by strawberry cultivars have been presented in Table 1 and illustrated in Fig. 1. The maximum number of fruits per plant (37.32) was noticed under Nabila (V_1) in present investigation. The minimum number of fruits per plant (25.97) was recorded under Camarosa (V_2), which was found significantly different with the (V_1) at 5% level of significance. The number of fruits per plant varied between 25.97 and 37.32. Because of more flower production, fruits harvested per plant were also more. Similar results were found by Baumann *et al.* (1993) [1], Belakhud *et al.* (2015) [2], Das *et al.* (2016) [3], Negi and Upadhyay (2016) [7], Gaikwad *et al.* (2018) [4], Neetu and Sharma (2018) [6] and Panigrahi *et al.* (2019) [8] in strawberry.

Fruit weight (g)

The data pertaining to fruit weight (g) is presented in Table 1 and graphically depicted in Fig 1. Fruit weight (g) was significantly influenced by different strawberry cultivars. Between both the cultivars the heaviest fruits were produced by Nabila (V_1) with 23.90 g per fruit weight and the lightest fruits were produced by Camarosa (V_2) with 20.14 g per fruit weight. There were significant differences between both the cultivars with respect to fruit weight. According to Morgan (2006), 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 accordance with the findings of Belakhud *et al.* (2015) [2], Das *et al.* (2016) [3], Negi and Upadhyay (2016) [7], Gaikwad *et al.* (2018) [4], Neetu and Sharma (2018) [6] and

Panigrahi *et al.* (2019) [8] in strawberry.

Table 1: Performance of different strawberry cultivars for yield, yield attributing parameters and benefit: cost ratio under farmer's field condition (Baadi) in the plain region of Chhattisgarh

Parameters	Nabila (V_1)	Camarosa (V_2)	P(T<=t) two-tail
Number of fruits/plants	37.42	25.97	0.0047*
Fruit weight (g)	23.90	20.14	0.0026*
Fruit length (cm)	5.35	4.68	0.0209*
Fruit diameter (cm)	4.10	3.25	0.0345*
Fruit yield (g/plant)	745.33	568.47	0.0152*
Fruit yield (q/ha)	361.40	289.02	0.0023*
B: C ratio	4.06	2.71	0.0358*

*Significant at 5% level of significance

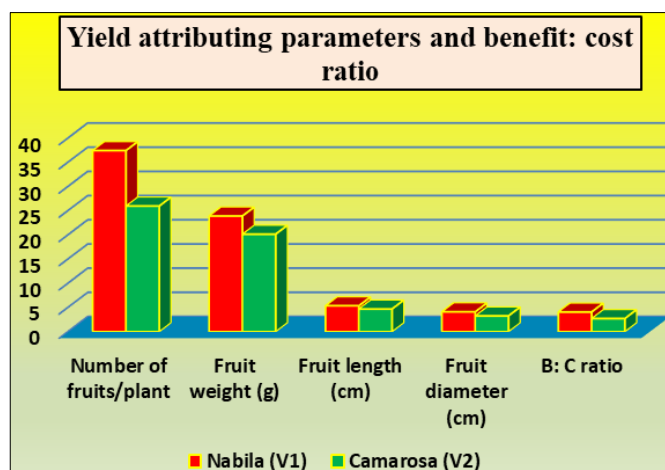


Fig 1: Performance of different strawberry cultivars for yield attributing parameters and benefit: cost ratio of strawberry cultivation under farmer's field condition (Baadi) in the plain region of Chhattisgarh

Fruit length (cm)

The data gathered on fruit length (g) was very much influenced by strawberry cultivars have been presented in Table 1 and illustrated in Fig. 1. The maximum length of fruits (5.35 cm) was noticed under Nabila (V_1) in present investigation. The minimum number of fruits per plant (4.68 cm) was recorded under Camarosa (V_2), which was found significantly different with the (V_1) at 5% level of significance. The fruit length (g) varied between 4.68 and 5.35. The result is accordance with finding of Das *et al.* (2015) [3] who reported the longest fruit (4.90 cm) in cultivar festival whereas minimum fruit length (2.90 cm) was recorded in cultivar camarosa. The variations in the size of the fruit might be due to differential genetic make of the genotypes. This observation finds support from the findings of Das *et al.* (2016) [3], Negi and Upadhyay (2016) [7], Gaikwad *et al.* (2018) [4], Neetu and Sharma (2018) [6] and Panigrahi *et al.* (2019) [8] in strawberry.

Fruit diameter (cm)

It is evident from the data (Table 1), fruit diameter was significantly influenced by different strawberry cultivars under the present investigation (Fig. 1). The maximum fruit diameter (4.10 cm) was noted under Nabila (V_1) and the minimum fruit diameter (3.25 cm) was recorded under Camarosa (V_2). The observation recorded for fruit diameter (cm) showed significant variations between both the strawberry cultivars. Similar opinion was also put forwarded

by Das *et al.* (2016) [3], Negi and Upadhyay (2016) [7], Gaikwad *et al.* (2018) [4], Neetu and Sharma (2018) [6] and Panigrahi *et al.* (2019) [8] in strawberry.

Fruit yield (g/plant)

The observations related to fruit yield per plant (g) showed significant variations between both strawberry cultivars tested in the present investigation (Fig. 2). It is apparent from the data (Table 1) that the fruit yield per plant (g) was ranged from 568.47 to 745.33 g under different strawberry cultivars. The highest fruit yield (745.33 g/ plant) was recorded under Nabila (V₁), which was significantly differs with another cultivar. The minimum fruit yield (568.47 g/ plant) was recorded under Camarosa (V₂). The increase in fruit yield could be attributed to the maximum flowering and fruits with greater weight. The results are accordance with finding of Belakhud *et al.* (2015) [2], Das *et al.* (2016) [3], Negi and Upadhyay (2016) [7], Gaikwad *et al.* (2018) [4], Neetu and Sharma (2018) [6] and Panigrahi *et al.* (2019) [8] in strawberry.

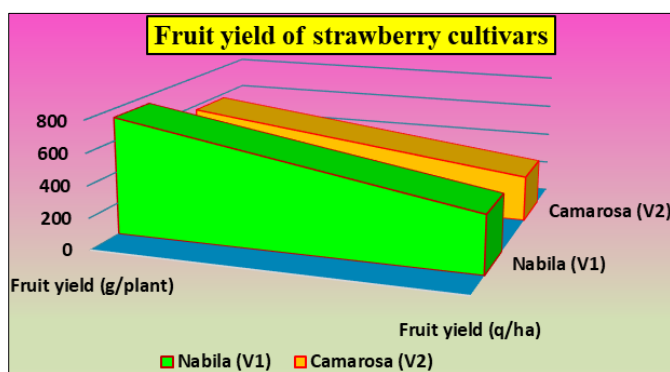


Fig 2: Performance of different strawberry cultivars for fruit yield (g/plant & quintal/ha) under farmer's field condition (Baadi) in the plain region of Chhattisgarh

Fruit yield (q/ha)

The observations related to fruit yield per hectare (q) showed significant variations between both strawberry cultivars tested in the present investigation. Results are presented in Table 1 and graphically depicted in Fig 2. It is apparent from the data that the fruit yield per hectare (q) was ranged from 289.02 to 361.40 g under different strawberry cultivars. The highest fruit yield (361.40 q) per hectare was recorded under Nabila (V₁), which was significantly differs with another cultivar. The minimum fruit yield (289.02 q) per hectare was recorded under Camarosa (V₂). The increase in fruit yield could be attributed to the maximum flowering and fruits with greater weight. The results are accordance with finding of Belakhud *et al.* (2015) [2], Das *et al.* (2016) [3], Negi and Upadhyay (2016) [7], Gaikwad *et al.* (2018) [4], Neetu and Sharma (2018) [6] and Panigrahi *et al.* (2019) [8] in strawberry.

Benefit: Cost ratio

It is apparent from the Table 1 that the benefit: cost ratio of strawberry cultivation was ranged from 2.71 to 4.06 under different strawberry cultivars (Fig. 1). The highest benefit: cost ratio (4.06) was recorded under Nabila (V₁), which was significantly differs with another cultivar. The minimum benefit: cost ratio (2.71) was recorded under Camarosa (V₂). Benefit cost ratio could be seeming highest due to the better utilization of climatic environment and photoperiod. The increase in benefit: cost ratio of strawberry cultivation could

be attributed to the maximum flowering, fruiting, higher yield and low cost under farmer's field condition. The results are accordance with finding of Belakhud *et al.* (2015) [2], Das *et al.* (2016) [3], Negi and Upadhyay (2016) [7], Gaikwad *et al.* (2018) [4], Neetu and Sharma (2018) [6] and Panigrahi *et al.* (2019) [8] in strawberry.

References

1. Baumann TE, Eaton GW, Spaner D. Yield Components of Day-neutral and Short-day Strawberry Varieties on Raised Beds in British Columbia. *Horticultural Science*. 1993;28(9):891-894.
2. Belakhud B, Bahadur V, Prasad VM. Performance of strawberry (*Fragaria x ananassa* Duch.) varieties for yield and biochemical parameters. *Pharma Inno. J.* 2015;4(10):05-08.
3. Das AK, Singh KP, Prasad B, Kumar Ravindra. Evaluation of cultivars of strawberry, a temperate fruit for its adaptability as well as productivity in sub-tropical agro-climatic condition of Supaul district in Bihar. *The Asian J of Hort.* 2016;10(2):278-281.
4. Gaikwad SP, Sali VM, Chalak SU. Performance of strawberry cultivars under Mahabaleshwar conditions. *Journal of Pharmacognosy and Phyto chemistry.* 2018;7(4):1850-1852
5. Morgan KL. Commodity strawberry profile. Retrieved from; 2012. <http://www.agmrc.org/commodities/products/fruits/strawberries/commodity/Strawberry-profile>
6. Neetu, Sharma SP. Evaluation of Strawberry Cultivars for Growth and Yield Characteristics in Plain Region of Chhattisgarh, India. *Int. J Curr. Microbiol. App. Sci.* 2018;7(2):2835-2840.
7. Negi ND, Upadhyay SK. Evaluation of strawberry (*Fragaria x ananassa* Duchesne.) cultivars under polyhouse condition in mid hills of Himachal Pradesh. *Himachal Journal of Agricultural Research.* 2016;42(1):41-46
8. Panigrahi HK, Sharma GL, Sangeeta, Patel, Rakesh. Evaluation of different strawberry (*Fragaria x ananassa* Duch.) Cultivars for Yield attributing parameters and Benefit: cost ratio under net tunnel. *Bull. Env. Pharmacol. Life Sci.* 2019;9(1):166-169.
9. Sharma SP. Evaluation of Strawberry Cultivars in Chhattisgarh Plain. *International Journal of Current Microbiology and Applied Science.* 2017;7(02):2835-2840.