SHORT COMMUNICATION

Evaluation of Some Strawberry (*Fragaria x Ananassa* Duch) Cultivars under Jammu Plains

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The cultivated strawberry (*Fragaria* x *Ananassa* Duch) belongs to family Rosaceae is derived from the hybridization of two native American species, namely, *F. chiloensis* Duch and *F. virginiana* Duch, which was first developed in France in the 17th century (Sharma and Yamdagni, 2000). Delicate of flavour and rich in vitamins and minerals, strawberry is now a favoured food in the diet of millions of people around the globe. It can be processed into a variety of products through various processes such as canning in syrup, jamming, drying, freeze drying, candying, freezing etc.

At present, strawberry is grown in all kinds of climates including temperate, mediterranean, sub-tropical and tiaga zones. It offers a quicker return on capital investment than any other fruit since under special methods of cultivation, a crop can be picked as early as the first summer after planting (Hughes *et al.*, 1969). Strawberry yield and quality are greatly influenced by a number of factors (soil, environment, pests, diseases etc.) and as a result, plants of a particular cultivar may grow well in one region but may perform poorly in another where environmental conditions are different (Hancock *et al.*, 1996). The fruiting potential of individual cultivars can be exploited only after growing it in the optimum/suitable soil and climatic conditions which need testing.

In spite of being a highly remunerative crop for Jammu plains, very little attention has been given by the researchers to assess the suitability of individual strawberry cultivation. The present study was made to identify the suitable and locally adaptable cultivars(s) for commercial cutlivation in the sub-tropical conditions of Jammu region.

The present study was conducted at KVK Farm, Udheywalla, RS Pura, during 2000-2001 on eight strawberry cultivars, namely, Addie, Belrubi, Brighton, Chandler, Confitura, Fern, Gorella and Selva, planted on 15.11.2000 at 45 x 30 cm. The plants were planted on raised beds (3.00 x 1.35 m) in three rows. The experiment was laid out in Randomised Block Design and replicated thrice. For recording data, 15 plants (out of 30 plants) of each cultivar in a replication were selected randomly. Total number of flowers of selected plants were recorded throughout the fruiting season and expressed as per plant basis. Fruit set (%) was calculated as per the formula given by Westwood (1978). Total number of malformed/deformed fruits from selected plants were counted and expressed in per cent. Duration of picking was calculated by counting the days between first picking to last picking. For calculating yield/plant the weight of total fruits of selected plants was measured and expressed on per plant basis.

The fruits were harvested at commercial maturity and subjected to various quality attributes. Fruit size and total soluble solids were measured with the help of vernier calliper and hand refractometer, respectively. Titratable acidity and sugars were estimated by titration method (Horwitz, 1980). To assess the consumer preference, organoleptic evaluation was conducted by a panel of 10 judges as per the method of Hedonic scale (Gould, 1978). Scoring was done out of 10 and their rating was done as per the following scale:

10 - Excellent; 9 - Very good; 8 - Good; 7 - Moderately good; 6 - Fair; 5 - Moderately fair; 4 - Poor; 3 - Very poor; 2 - Not acceptable.

Data relating to various yield and quality contributing characters (Table 1) revealed that all the tested cultivars started to bloom in the beginning of 3rd week of January except Selva wherein blooming was delayed by 5-6 days. The total number of flowers/plant registered significantly higher in Belrubi (16.40) followed by Gorella (13.53) and Confiura (12.87), while their lowest number was recorded in Brighton (7.67) without showing any statistical difference with Selva (9.41). Per cent fruit

Table 1. Mean values for some yield and quality traits in eight strawberry cultivars

Cultivar	Date of first flower emergence	Flower number/ plant	Fruit set (%)	Malformed fruits (%)	Duration of picking (days)	Yield/ plant (g)	Fruit size (LxW) in cm)	Total soluble solids (°B)	Titratable acidity (%)	Total	Sugars (%)		Organoleptic rating
											Reducing	Non-reducing	
Addie	19.01.2001	12.45	74.10	40.00	50.33	54.54	1.95 x 1.34	8.70	0.72	6.97	5.22	1.66	7.27
Belrubi	18.01.2001	16.40	84.51	25.56	50.33	69.53	2.44 x 1.45	7.67	0.86	5.09	4.11	0.93	7.93
Brighton	18.01.2001	7.67	86.21	38.89	49.33	42.47	2.12 x 1.34	7.53	0.73	5.67	4.09	1.50	7.47
Chandler	19.01.2001	12.20	80.71	37.30	49.67	67.64	2.40 x 1.78	7.67	0.71	5.36	4.67	1.26	8.00
Confitura	18.01.2001	12.87	77.40	34.30	49.00	52.52	1.74 x 1.31	6.97	0.63	5.26	4.15	1.19	7.80
Fern	18.01.2001	11.73	80.17	26.81	50.67	36.60	1.40 x 1.07	9.07	0.51	6.62	4.43	2.72	7.73
Gorella	18.01.2001	13.53	81.17	26.88	52.33	81.90	2.40 x 1.67	9.10	0.63	7.08	5.34	1.65	9.63
Selva	24.01.2001	9.41	78.10	42.12	33.00	46.02	2.33 x 1.63	6.57	0.68	4.86	3.92	0.89	6.43
CD (0.05)	—	2.80	6.77	9.05	4.20	17.29	0.49 x 0.38	0.30	0.10	0.56	0.30	0.50	0.98

set was relatively higher in Brighton (86.21%) and no significant difference was recorded among Belrubi Chandler, Fern and Gorella. Malformed fruits were recorded higher than the other cultivars. Fern in Selva (42.12%) and Addie (40.00%)

No significant difference is picking duration was observed in Gorella (52.3 days) followed by Confitura (50.6 days), Addie and Belrubi (each 50.3 days), Chandler (49.67 days), Brighton (49.33 days) and Confitura (49.00 days), difference, while it was shortest in Selva (33.00 days). Of the various cultivars tested, Gorella gave the highest yield (81.90g/plant). Of the 4 cultivars tested by Ivanov (1976), a satisfactory yield was obtained from Belrubi (12194 kg/ha) and Gorella (11656 kg/ha) strawberries. Bringhurst and Voth (1989) suggested Chandler to be the best cultivar for lower elevations.

The physio-chemical fruit characteristics as influenced by different cultivars is given in Table 1. The fruit size was larger in Belrubi (2.44 × 1.45 cm), Chandler (2.40 × 1.78 cm) and Gorella (2.40 × 1.67 cm) than other cultivars tested. Similarly these three varieties were reported notable for large fruit size by Hancock *et al.* (1996). Rosati *et al.* (1982) also observed Gorella to be a large fruited variety.

The content of total soluble solids was quite higher statistically in Fern (9.07°B) and Gorella (9.10°B) cultivars and its lowest value was registered in Selva (6.75°B) (Table 1). The highest and lowest values of fruit acid content were recorded in Belrubi (0.86%) and Fern (0.51%), respectively. The total sugar content was higher and statiscally similar in Gorella (7.08%); Addie (6.97%) and Fern (6.62%) and was registered lowest in Selva (4.86%). Almost similar trend was noticed in case of reducing sugars. The content of non reducing sugar was highest in the fruits of Fern (2.72%). Similar variability in sugars and TSS contents in strawberries was also reported by several researchers (Grewal *et al.*, 1988; Wrolstad *et al.*, 1990; Shamaila *et al.*, 1992).

The fruits of Gorella strawberry were found most acceptable as they scored the highest numerical rating (9.63) followed by Chandler (8.00) and Belrubi (7.93) evaluated through organoleptic test (Table 1). The organoleptic quality of fruits is greatly influenced by sugar content (Alavoine and Crochen, 1989) as also observed in the present studies in case of Gorella.

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