

Short communication**Studies on growth, yield and physico-chemical characteristics of some peach cultivars under mid-hill conditions of Himachal Pradesh****Seema Thakur*, D.P. Sharma and N. Sharma**

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ABSTRACT

Present investigation was carried out on peach new introductions, namely, 'Glohaven', 'Suncrest', 'Early Elberta' and 'July Elberta' during 2010 and 2011 and suitability of these introductions under sub-temperate regions of Himachal Pradesh was studied. The maximum scion girth (39.93 cm) in 'July Elberta', shoot length (84.77 cm) in 'Glohaven' and leaf area (54.09 cm²) in 'Early Elberta' were recorded. The highest yield (38.02 kg/ tree) was observed in 'Early Elberta'. However, the better quality fruits with respect to highest TSS, acidity, reducing sugars and ascorbic acid content were produced by 'Glohaven'.

Key words: Peach genotypes, performance, physico-chemical characteristics, yield.

Peach (*Prunus persica* Batsch) is an important stone fruit of sub-temperate mid-hill regions of Himachal Pradesh. The main cultivar of peach being grown in mid-hills of Himachal Pradesh is 'July Elberta', which ripens in the first fortnight of July after onset of monsoon. Though, early maturing cultivars like 'Redhaven' and 'Sunhaven' have also been recommended for the mid-hills but these cultivars have not succeeded commercially due to erratic and shy bearing nature with poor yield and quality. Thus, the main problems linked to production of existing cultivars are shortened consumption season, erratic and shy bearing, high production cost and reduced adaptability to changing climatic conditions. Therefore, there is a need to replace the existing cultivars with those cultivars, which show better adaptability to changing climatic conditions and mature early than 'July Elberta'.

The experiment was conducted on 8-year-old uniform trees of four peach cultivars, namely, 'Early Elberta', 'Glohaven', 'Suncrest' and 'July Elberta' during 2010 and 2011 at Horticultural Research Station (HRS), Kandaghat, Solan situated at an elevation of 1,450 m above msl. The experiment was laid out in Randomized Block Design with five replications of each peach cultivar. The experimental trees were planted at a spacing of 4 m × 5 m and trained to open centre system. These plants received uniform cultural practices during the experimentation. Observation on growth parameters, viz., scion girth, annual shoot growth and leaf area were recorded as per the standard methods and worked out to express mean value. Mature fruits

were harvested periodically in each replication separately and the fruit weight was recorded with the help of single pan balance. Ten fruits per replication of each cultivar were taken for physico-chemical analysis. Fruit length and diameter were recorded with the help of Vernier calipers and fruit shape was visually observed after comparing with fruit shape given in IPGRI Peach Descriptor. Fruit weight was calculated by weighing them on top pan electronic balance. Pulp to stone ratio was worked out by dividing pulp weight with stone weight.

Fruit volume was recorded by water displacement method and fruit firmness with the help of a fruit pressure tester (Magness-Taylor). Surface and pulp colour of fruits was observed visually after harvesting and compared with Colour Chart of Royal Horticultural Society, London. Chemical characteristics like total soluble solids (°Brix) was determined by Erma hand refractometer and acidity with the help of titration method. Total sugars, reducing sugars and non-reducing sugars were determined as per the methods prescribed by AOAC (1), while ascorbic acid was determined as per the procedure given by Ranganna (2). Statistical analysis of the data was carried out by the method of analysis of variance as suggested by Gomez and Gomez (3).

The maximum scion girth was recorded in 'July Elberta', while minimum in 'Early Elberta', respectively. Annual shoot growth was found to be maximum in 'Glohaven'. The maximum leaf area was observed in 'Early Elberta', while 'July Elberta' had the minimum annual shoot growth as well as leaf area (Table 1). Badiyala and Lakhanpal (4) and Singh *et al.*

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Table 1. Growth, yield and fruit characteristics of different peach cultivars under mid hill conditions of Himachal Pradesh (pooled data).

Cultivar	Scion girth (cm)	Annual shoot length (cm)	Leaf area (cm ²)	Fruit length (mm)	Fruit dia. (mm)	Fruit vol. (cm ³)	Fruit shape	Fruit wt. (g)	Pulp: stone ratio	Yield per tree (kg)	Productivity (Mt/ ha)
Early Elberta	32.58	69.96	54.09	69.51	63.41	120.77	Oblong	135.90	20.43	38.02	19.02
Glohaven	35.61	84.77	50.30	66.43	65.45	138.85	Round	147.36	21.65	32.74	16.38
July Elberta	39.93	68.47	40.32	62.90	59.81	100.53	Ovate	115.63	19.10	31.30	15.65
Suncrest	34.02	74.69	48.22	63.56	62.01	108.02	Round	119.53	20.66	35.45	17.73
CD _{0.05}	3.66	6.61	1.89	1.32	1.63	12.35	-	10.56	1.07	3.83	1.92

(5) also observed differential behaviour of different growth traits in peach cultivars under the climatic conditions of Himachal Pradesh and Jammu and Kashmir, respectively. Highest yield and productivity were recorded in 'Early Elberta' (38.2 kg/tree), which had non-significant differences with 'Suncrest' (35.45 kg/tree) and minimum yield was obtained in 'July Elberta' (31.30 kg/tree). The observations on yield are in conformity with the findings of Badiyala and Lakhanpal (4) under Poanta Valley conditions of Himachal Pradesh. 'Glohaven' produced large size fruits with respect to diameter, volume, weight, pulp: stone ratio and had maximum fruit firmness as well as fruit blush colour, whereas, fruits of 'July Elberta' were small as compared to other cultivars. The maximum fruit length was recorded in 'Early Elberta', whereas, minimum fruit length was in 'July Elberta'. Fruit shapes were oblong in 'Early Elberta', ovate in 'July Elberta', round in 'Glohaven' and 'Suncrest'. All the cultivars under study were yellow fleshed. The observations on fruit length, breadth, weight, pulp: stone ratio, fruit firmness and fruit surface colour of cultivars in present investigations were also supported by the findings of Saran *et al.* (6). Cultivar 'Glohaven' had the highest TSS, acidity, reducing sugars and ascorbic acid content, whereas minimum TSS and acidity were recorded in 'Early Elberta' in both the years. The minimum total sugars, reducing sugars and ascorbic acid content were observed for 'July Elberta', while maximum total sugars and non-reducing sugars were in 'Suncrest' (Table 2). The findings of present investigation are supported by the earlier reports of Kanwar *et al.* (7) and Babu and Yadav (8).

From the present investigations, it may be inferred that 'Glohaven' and 'Suncrest' are highly suitable for cultivation in mid hill conditions of Himachal Pradesh for their better fruit quality and earliness, and 'Early Elberta' for good yield potential in late group to provide varietal diversification and to stagger harvesting season.

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Table 2. Physico-chemical characteristics of different peach cultivars under mid hill conditions of Himachal Pradesh (pooled data).

Cultivar	Fruit firmness (kg/cm ²)	Surface colour		Pulp colour	TSS (°Brix)	Acidity (%)	Total sugars (%)	Reducing sugar (%)	Non-reducing sugars (%)	Ascorbic acid (mg/100 g)
		Blush colour (%)	Ground colour (%)							
Early Elberta	5.11	50.65 (45.36)	49.35 (44.61)	Yellow	8.11	0.41	8.42	2.60	5.53	25.46
Glohaven	7.12	76.70 (61.14)	23.30 (28.82)	Yellow	11.22	0.65	8.99	2.74	5.94	26.61
July Elberta	7.00	69.35 (56.37)	30.65 (33.59)	Yellow	10.56	0.59	8.03	2.28	5.46	21.72
Suncrest	6.69	72.45 (58.36)	27.55 (31.61)	Yellow	9.60	0.60	9.30	2.59	6.38	25.96
CD _{0.05}	0.39	(2.26)	(2.26)	-	0.96	0.06	0.76	0.26	0.59	2.86

*Figures in parenthesis are Arc sine transformed values.

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