Indian J. Pl. Genet. Resources 12(3): 389-391, 1999

Short Communication

PERFORMANCE OF SOME PEAR (*Pyrus communis* L) CULTIVARS UNDER MID HILL CONDITIONS OF HIMACHAL PRADESH

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This communication deals with evaluation of six pear cultivars viz., Bartlett, China, Flemish Beauty, Laxton's superb, Max Red Bartlett and Starking Delicious for quality parameters

Key words : Pear, fruit characteristics

The Pear, the second most important delicious tree fruit after apple, has been known since prehistoric times; dried slices have been unearthed in Swiss cave dwelling of the Ice Age (Janic, 1982). Pear ranks third among fruit crops in world production. The common pear (*P. communis* L.) like apple has been selected, improved and cultured since the prehistoric times. It derives possibly from relatively large fruited wild species, *P. caucasica* Fed and *P. nivalis* Jacq. Being a hardy crop, pear can be grown even on marginal lands where other crops are outright failure. According to Singh (1992), pear is the only temperate fruit grown on the hilly part of South India. In India, the major pear growing areas are found in Jammu and Kashmir, Himachal Pradesh, sub-mountain tracts of Uttar Pradesh and the plains of Punjab. Despite early introduction and general popularity, pear is not as widely grown as the apple. Scant attention of Indian researchers towards soft pears might be a possible reason for its low acceptability by the growers. Therefore, the present study was made to assess the performance of some promising genotypes of soft pear grown under mid hill-zone of Himachal Pradesh.

The present investigation was carried out in the experimental orchard of Department of Fruit Breeding and Genetic Resources, Dr. YSPUH&F, Solan in 1992-93 and 1993-94 on twenty six, 17 year old trees of six pear cvs. *Bartlett, China, Flemish Beauty, Laxton's Superb, Max Red Bartlett* and *Starking Delicious*. The experiment was laid out in Randomized Block Design and replicated thrice. The fruits were harvested at commercial maturity and subjected to quality evaluation. Fruit size (in terms of length × diameter) was recorded individually with Vernier Calipers. Skin colour of fruits was determined by matching it with Horticultural Colour Charts issued by the British Colour Council in collaboration with the Royal Horticultural Society, London. Flesh firmness was measured with an Effegi panetrometer - FT 327 and expressed as Newton (Force in Kg × 9.807). Titratable acidity (%) and total sugars (%) were determined by standard AOAC method (Horwitz, 1980), while total soluble solids (^{o}B) of the expressed juice was determined with an Erma hand refractometer (0 to 32%). Starch (%) was estimated by the Anthrone Reagent method (Clegg, 1956). The bioelectrical conductance was recorded

Table 1. Physico-chemical and physiological fruit characteristics of some pear cultivars (Pooled Mean for 1992-93 & 1993-94)

Cultivar	Date of Commercial Picking	Fruit size (length × diameter) (cm)	Weight (g)	Skin* Colour	Flesh Firmness (N)	Titratable acidity (%)	TBS (°B)	Sugars (%)	Bioelectrical conductance (m mhos/cm)	Starch (%)	Respiration (mg CO_2/kg/h)	Ethylene evolution (µl/kg/h)
Barlett	1st-2nd Aug.	6.69×6.35	136.0	YG150A	85.46	0.43	12.29	8.51	4.70	1.57	4.70	21.48
China	18-19th July	5.91 × 5.82	112.30	YG149C	89.69	0.46	12.12	6.91	5.49	1.42	5.50	23.58
Flemish Beauty	25-26th July	6.21 × 6.19	136.50	YG145A	57.73	0.40	12.21	8.85	4.85	1.64	4.95	22.74
Laxton's Superb	1st-2nd Aug.	7.14 × 7.10	174.00	YG150A	90.09	0.43	12.44	8.88	4.61	1.71	4.61	16.00
Max Red Bartlett	8th-9th Aug.	7.08 × 7.02	173.50	RP59A	75.49	0.40	12.17	8.44	4.42	0.93	4.42	17.76
Starking Delicious	1st-2nd Aug.	6.68 × 6.62	149.15	YG149A	85.05	0.40	13.33	8.73	5.62	0.87	5.62	23.17
CD (0.05)	-	0.25	0.22	5.03	-	3.25	0.02	0.18	0.24	0.09	0.06	0.36

*YF-Yellow Green; RP-Red Purple

in m mhos/cm on a direct reading Systonics 303 conductivity meter. The ethylene evolution rate (µl/kg/h) of pear fruits was estimated with gas liquid chromatography as per the method described by Dilley *et al.* (1978). The gas flow method as described by Mayer *et al.* (1966) was employed for the quantitative measurement of respiration as CO_2 evolved in mg/kg/h by the fruit samples.

Data relating to various fruit characteristics indicated that the significantly highest values for fruit size (length × diameter) were recorded by *Laxton's Superb* (7.14 × 7.10 cm) followed by *Max Red Bartlett* (7.08 × 7.02 cm). While *China* pear produced the smallest fruits (5.91 × 5.82 cm). The same pattern was noticed for fruit weight and the highest (174.0 g) and the lowest (112.30 g) values were registered by *Laxton's Superb and China*, respectively. Cultivars did not show much variation for skin colour and ranged between Yellow Green 149C to 150A except in the red pigmented cultivar *Max Red Bartlett* which was lying in the range of red purple i.e. RP 59A.

At the time of commercial picking, *Flemish Beauty* pear produced the most soft fruit showing lowest flesh firmness (57.73 Newton), while it was the highest in *China* (89.69 Newton) Moreover, cultivar China was more acidic (0.46%) than other cultivars. The total soluble solids (TSS) of fruit was significantly high in *Starking Delicious* (13.33° B), whereas its lowest value was recorded with the fruits of *China* (12.21° B) pear. Of the 6 cultivars, *Flemish Beauty* (8.85%), *Laxton's Superb* (8.88%) and *Starking Delicious* (8.73%) were found equally good statistically for their total sugar contents, while its lowest value was shown by *China* (6.91%). The leakage of electrolytes from membrane into cytoplasm measured in terms of bioelectrical conductance was significantly higher in the fruits of *Starking Delicious* (5.62 m mhos/cm followed by *China* (5.49 m mhos) and its least value was recorded with *Max Red Bartlett* (4.42

m mhos/cm). The lowest and highest values of starch were registered with *Starking Delicious* (0.87%) and *Laxton's Superb* (1.71%), respectively, at the time of commercial maturity.

The rate of respiration (mgCO_2/kg/h) and ethylene evolution (µl/kg/h) were significantly higher in the fruits of *China* (5 mg CO_2/kg/hr) and 23.58 (ul/kg/h) and *Starking Delicious* (5.62 mg CO_2/kg/h and 23.17 µl/kg/h), while lowest respiration rate (4.42 mg CO_2/kg/h) and ethylene evolution rate (16.00 µl/kg/h) were recorded in *Max Red Bartlett* and *Laxton's Superb*, respectively. Relatively soft cultivars like *China, Flemish Beauty* and *Starking Delicious* showed somewhat higher rates of ethylene evolution and respiration which might be the cause for their poor shelf life (Sharma, 1995).

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