Environment & Ecology 27 (4B) : 1923—1926, 2009
 ISSN 0970-0420

Performance of some Low Chilling Peach Cultivars under North Indian Conditions

J. S. JOSAN, S. K. THIND, P. K. ARORA AND ANIL KUMAR

Punjab Agricultural University, Regional Station
Abohar 152116, India

Abstract

The investigation was undertaken to study the performance of peach cultivars viz. Earli Grande, Florda Prince, Partap, Prabhat and Shan-e-Punjab under the north Indian conditions. Observations with respect to flowering behavior, fruit yield, quality attributes and insect-pest incidence were recorded. The fruit yield was observed to be maximum (59.67 kg/tree) in cv Shan-e-Punjab while it was minimum (34.17 kg/tree) in cv Florda Prince. Maximum, fruit weight (75.50 g) was recorded in cv Shan-e-Punjab. Total soluble soilds were highest (9.93%) in cv Prabhat and minimum (8.70%) in cv Earli Grande. Cultivars Earli Grande, Florda Prince, Prabhat and Partap were observed to be earliest (last week of April) to reach maturity while, Shan-e-Punjab matured during the first week of May and thus are suitable for cultivation under north Indian conditions. Incidence of insect pests on different peach cultivars revealed that peach leaf curl aphid and fruit fly were the regular pests. The highest fruit infestation of fruit fly was observed in cultivar Shan-e-Punjab while, it was least in Florda Prince and Partap.
Key words : Peach varietal evaluation, Yield performance, Insect pest.

Peach is one of the most important fruits being grown in the temperate region but some cultivars are also being grown successfully in the sub-tropical and arid-irrigated region of Punjab (1—3). The major hindrance in cultivation of peaches under the south-western districts of Punjab has been the lack of adapted cultivars. However, with the introduction of some peach cultivars having low chilling requirements, a large number of varieties have been evaluated under various agro-climatic regions. Hence, efforts were made to study the performance of some low chilling peaches under north Indian conditions.

Methods

The investigation was undertaken at Regional Station, Abohar during 2005 and 2006 on eight-year-old peach trees. Five peach cultivars viz. Earli Grande, Florda Prince, Partap, Prabhat and Shan-e-Punjab were evaluated for the fruit yield and quality attributes. The plantation was done at a distance of 6.7 m × 6.7 m apart. The flowering behavior of all the cultivars was recorded visually. A random sample of 25 fruits was collected from each replication and the quality attributes were estimated as per standard methods (4).

All the peach cultivars were regularly observed for recording incidence of major pests in peach during their peak time of infestation. Out of several pests only peach leaf curl aphid *(Brachycaudus helichrysi)* and fruit fly *(Bactrocera dorsalis)*were found to be regular pests. The data for peach leaf curl aphid were recorded from five randomly selected twigs per tree representing one replication and there were three replications in all. In fruit fly, 50 mature fruits randomly selected from one tree were examined for infestation. One such sample comprising 50 fruits was treated as one replication and there were three replications per treatment. Prior to recording the per cent fruit infestation, the fruits were kept in the laboratory under ambient conditions for two days to enable the eggs to hatch and infestation to become distinct. On dissection, fruits showing maggots were considered as infested.

Results and Discussion

Flowering Behavior

The visual observations revealed that the flower buds were borne on the mature season's growth. Three buds appear at one node and out of these, two are floral buds and the third was vegetative. Similar findings have been reported by Josan et al. (2) and

Table 1. Flowering behavior of different peach cultivars.

Cultivars	Opening of first flower		Full bloom period				Opening of last flower		Flowering duration (days)		Maturity period	
	2005	2006	2005		2006		2005	2006	2005	2006	2005	2006
			From	To	From	To						
Earli Grande	27/1	30/1	7/2	24/2	8/2	27/2	8/3	11/3	41	41	Last week of Apr	Last week of Apr
Florda Prince	28/1	30/1	9/2	26/2	11/2	28/2	10/3	11/3	42	41	Last week of Apr	Last week of Apr
Partap	27/1	29/1	8/2	26/2	10/2	28/2	11/3	13/3	44	46	Last week of Apr	Last week of Apr
Prabhat	27/1	29/1	10/2	26/2	10/2	28/2	8/3	11/3	41	43	Las week of Apr	Last week of Apr
Shan-e-Punjab	5/2	8/2	12/2	22/2	14/2	27/2	10/3	12/3	34	36	First week of May	First week of May

Singh (5). The flower initiation was the earliest in cv Earli Grande, Partap and Prabhat while, Shan-e-Punjab was the last (Table 1). The period of full bloom varied among the cultivars between 7 and 26 February during 2005 and between 8 and 28 February during 2006. Duration of flowering also varied also varied from 34 days in Shan-e-Punjab to 44 days in Partap during 2005 and from 36 days in Shan-e-Punjab to 46 days in Partap during 2006. Josan et al. (2) have also reported the similar findings in peach. The cultivars Earli Grande, Florda Prince, Partap and Prabhat were the earliest to attain maturity during the last week of April while, Shan-e-Punjab was the last to attain maturity i.e.first week of May. Chanana et al. (1) and Josan et al. (2) have also observed that Partap was the earliest to reach maturity.

Fruity Quality

Table 2 reveals that fruit yield was the maximum (59.67 kg/tree) in cv Shan-e-Punjab while, it was the minimum (34.17 kg/tree) in cv Florda Prince. A signifi-

Table 2. Physico-chemical characters of various peach cultivars.

Cultivar	Fruit yield (kg/tree)			Av. fruit weight (g)			Pulp : stone ratio		
	2005	2006	Mean	2005	2006	Mean	2005	2006	Mean
Earli Grande	40.67	50.67	45.67	67.00	72.33	69.67	8.80	8.66	8.73
Florda Prince	27.33	41.00	34.17	63.00	65.67	64.34	8.87	8.95	8.91
Partap	41.67	52.33	47.00	63.33	68.67	66.00	9.66	9.66	9.61
Prabhat	37.00	40.00	48.50	62.67	61.67	62.17	9.27	9.48	9.38
Shan-e-Punjab	51.00	68.33	59.67	74.00	77.00	75.50	9.70	9.71	9.70
CD at 5%	10.62	11.98	-	NS	8.32	-	0.38	0.02	-

Table 2. Continued.

Cultivar	TSS (%)			Acidity (%)			TSS/acid ratio		
	2005	2006	Mean	2005	2006	Mean	2005	2006	Mean
Earli Grande	8.53	8.87	8.70	0.917	0.947	0.932	9.30	9.37	9.33
Florda Prince	8.80	8.73	8.77	0.764	0.913	0.839	11.52	9.56	10.54
Partap	9.20	9.33	9.27	0.857	0.862	0.860	10.74	10.82	10.78
Prabhat	10.13	9.73	9.93	0.759	0.721	0.740	13.35	13.49	13.42
Shan-e-Punjab	9.80	9.53	9.67	0.891	0.819	0.855	11.00	11.64	11.32
CD at 5%	0.43	0.23	-	0.056	0.08	-	0.73	0.84	-

Table 3. Incidence of insect pests on different peach cultivars. I—First fortnight, II—Second fortnight.

	Per cent insect pest infestation											
	Peach leaf curl aphid (per cent twig infestation)							Fruit Fly (per cent fruit infestation)				
	Mar		Apr		May		Mean	Apr	May		Jun	Mean
Cultivar	I	II	I	II	I	II		II	I	II	I	
Earli Grande	26.66	40.00	26.66	0.00	0.00	3.33	16.10	0.00	10.66	14.00	07.33	07.99
Florda Prince	13.33	06.66	06.66	13.33	6.66	0.00	07.77	0.66	06.66	15.33	06.66	07.32
Partap	20.00	06.66	20.00	13.33	3.33	0.00	10.55	2.00	07.33	08.66	06.66	06.16
Prabhat	06.66	20.00	20.00	0.00	0.00	0.00	07.77	1.33	08.66	11.33	07.33	07.16
Shan-e-Punjab	26.66	33.33	26.66	06.66	3.33	0.00	16.10	2.00	12.66	16.00	20.33	12.74

cant variation was observed in various quality attributes among the cultivars. Maximum fruit weight (75.50 g) was recorded in Shan-e-Punjab followed by Earli Grande, Partap and Florda Prince while, it was the minimum (62.17 g) in cv Prabhat. Josan et al. (2) also observed the bigger fruits in cv Shan-e-Punjab. The external color of Prabhat was attractive whereas, it was yellowish in rest of the cultivars. The pulp/stone ratio was maximum (9.70) in Shan-e-Punjab while, it was the least (8.73) in Earli Grande. Total soluble solids were the highest (9.93%) in Prabhat and lowest (8.70%)in Earli Grande. Kaur et al. (6) have reported highest total soluble soilds in cultivar Prabhat. Contrary to this, acid content was the maximum (0.932%) in Earli Grande and minimum (0.740%) in Prabhat. Jonsan et al. (2) have also recorded the similar findings in peach cultivars.

Insect Pests

The data recorded on the incidence of various insect pests on different peach cultivars revealed that leaf curl aphid and fruit fly were the regular pests. Peach leaf curl aphid was observed infesting all the cultivars from March onwards (Table 3). In the first fortnight of March, the highest twig infestation of 26.66% was recorded in cultivars Shan-e-Punjab and Earli Grande, whereas Prabhat recorded only 6.66% infestation. The highest (40.0%) twig infestation by aphids was recorded in variety Earli Grande in second fortnight of March. Afterwards this population declined progressively and in May it was lowest. In fruit fly, the infestation started in the second fortnight of April and attained its highest peak in first fortnight of June. The highest fruit infestation of 20.33% was observed in cultivar Shan-e-Punjab. It was followed by varieties Earli Grande and Prabhat both recording 7.33% fruit fly infestation. The mean infestation by fruit fly varied from 6.16 to 12.74% in cultivars Partap and Shan-e-Punjab respectively. Irrespective of the time of sampling, the fruit fly infestation was highest (20.33%) in cv Shan-e-Punjab in June. This may be due to the late maturity of Shan-e-Punjab in May as compared to other cultivars which mature in April. The results of the present studies are in confirmation with the findings of Josan et al. (2) who reported that cultivars like Flordasun, Partap, Prabhat and Shan-e-Punjab escaped fruit fly infestation due to their early maturity.

Conclusion

It can be concluded that cv Earli Grande, Florda Prince, Prabhat and Partap were the earliest (last week of April) to reach maturity, while Shan-e-Punjab matured late i.e. during the first week of May and thus they are suitable for cultivation under north Indian conditions. Cultivar Shan-e-Punjab has been observed to be more susceptible to fruit fly rest of the cultivars.

References

1. Chanana Y. R., G. S. Hundal, S. S. Brar and I. S. Deol. 1992. Evaluation of some low chilling peach introductions for their suitability in the Punjab plains. *Golden Jubilee Nat. Sem. on emerging trends in temperate fruit production in India.* 4-5 Sep. 1992. Y. S. Parmar Univ. of Hort. and For., Solan, India.
2. Josan J. S., J. N. Sharma, P. K. Arora and V. K. Vij. 1999. Evaluation of low chilling peaches under arid-irrigated region of Punjab. *Indian J. Hort.* 56 : 19—22.
3. Nijjar G. S. and H. N. Khajuria. 1979. New peach cultivars for the Punjab. *Punjab Hort. J.* 28 : 66—68.
4. AOAC. 1980. *Official methods of analysis.*Assoc. Analyt. Chem. 13th edition Washington DC, USA.

5. Singh G. N. 1967. Studies on the floral biology of peaches under sub-tropical conditions. Punjab Hort. J. 7 : 103—107.

6. Kaur N., P. K. Monga, J. S. Josan and V. K. Vij. 2005. Growth pattern of developing fruits of peach cultivars. *Ann.Agric. Res. New Series* 26 : 361—364.