



# Performance of Low Chilling Peach Cultivars at Lower Hills of Nagaland

H.D. Talang<sup>1\*</sup> • B.C. Deka<sup>2</sup> • H. Rymbai<sup>1</sup> • M.B. Devi<sup>1</sup> • N.A. Deshmukh<sup>1</sup> • Vandana Verma<sup>3</sup> • T. Zhimomi<sup>3</sup> • A.K. Jha<sup>1</sup>

<sup>1</sup>ICAR Research Complex for NEH Region, Umiam

<sup>2</sup>Agriculture Technology Application and Research Institute, Umiam

<sup>3</sup>ICAR Research Complex for NEH Region, Nagaland Centre, Jharnapani

### ARTICLE INFO

#### Article history:

Received December 5 April 2017

Revision Received 25 September 2017

Accepted 12 November 2017

#### Key words:

Peach, low chilling, fruit quality, cultivar

### ABSTRACT

Low chilling varieties of peach *viz.* TA-170, Flordasun and Shan-e-Punjab were evaluated to find out a suitable cultivar for commercial production under low hill condition of Nagaland. The experiment was laid out in a randomized block design with 3 replications at ICAR Research Complex for NEH Region, Nagaland Centre, Medziphema during 2015-2016. The result revealed that cultivar TA-170 accounted for the maximum yield (15.58 kg/tree), fruit weight (40.27 g), fruit length (5.50 cm) and fruit diameter (4.50 cm) followed by Flordasun and lowest in Shan-e-Punjab. Maximum total sugars (13.71 %), reducing sugar (6.67 %) and TSS (17.35 °Brix) along with lowest acidity (0.27 %) content was observed in Flordasun. Maximum ascorbic acid (76.17 mg/100 g) content on the other hand was found in Shan-e-Punjab. From the present study, it may be concluded that Flordasun was the best performer followed by TA-170 and Shan-e-Punjab under low hill condition of Nagaland.

## 1. Introduction

Peach (*Prunus persica* (L) Batsch.) is the most preferred and legendary fruit species among the stone fruits which is grown under low temperature in hilly areas of temperate world. Due to stunning colours and high texture, peaches are generally valued for its fresh and canned fruits however, nowadays peach has become pride to poor and marginal hilly farmers of sub-mountainous regions, plains of northern India and southern hills (Jana, 2015). It is grown mainly in Jammu and Kashmir, Himachal Pradesh, Punjab, Uttarakhand, Nilgiri hills, Jharkhand and North Eastern States (Josan *et al.*, 2009). It is relatively performed well at an altitude ranging between 600-1000 m from msl. In recent times, with advance of breeding efforts low chilling peach cultivars have been developed and their cultivation stretches from temperate regions to subtropical worlds (Kuden *et al.*, 2004). In northeast India, the yield and quality of local cultivars grown by the farmers is quite poor and that it is requisite to trace the peach genotypes with higher yield and good quality.

Hence, attempts were made to evaluate some prominent low chilling peach genotypes suitable for low hill situation of Northeastern Hill Region particularly Nagaland.

## 2. Materials and Methods

An experiment was conducted at ICAR Research Complex for NEH Region, Nagaland Centre, Medziphema during 2015-16. The site of the experiment is situated at 25° 45'24"N latitude and 93° 50'26"E longitude with an average altitude of 265 m above mean sea level. The average annual rainfall received is 132.2 cm however the site receives considerable amount of rainfall during pre-monsoon (March-May) and post-monsoon (Oct-Nov.) periods, with an average annual humidity of 80-95 % and average temperature range of 10 °C to 35 °C.

Five years old low chilling varieties of peach *viz.* TA-170, Flordasun and Shan-e-Punjab were evaluated with respect to yield and quality traits of fruit. Four trees per replication of each genotype were selected from bearing orchard and data were taken from selected plants with respect to growth, yield and quality attributes. Ten fruits were randomly harvested from each replication.

\*Corresponding author: hammyllende@gmail.com

The data on fruit yield, fruit size and fruit weight were recorded at the time of harvesting. Total soluble solid (TSS) was determined with the help of digital refractometer. Acidity was determined by titrating the juice against N/10 NaOH and expressed as per cent citric acid as described by A.O.A.C. (1984). Total sugars, reducing sugar and ascorbic acid were analyzed as per method given by Rangana (2004). The data was statistically analysed by method of analysis of variance using Randomized Block Design as described by Panse and Sukhatme (1985).

**Table 1.** Fruit yield parameters of peach genotypes at 5<sup>th</sup> year of planting

Variety	Fruit weight (g)	Fruit length (cm)	Fruit diameter (cm)	Yield (kg/tree)
Flordasun	38.07	4.77	3.81	13.64
TA-170	40.27	5.50	4.50	15.58
Shan-e-Punjab	35.64	4.33	3.62	14.60
CD at 5%	2.49	0.38	0.3158	1.08

### 3. Results and Discussion

#### (a) Fruit weight (g), size (cm) and yield (kg/tree)

The data presented in table 1 indicated that highest fruit weight (40.27 g) was recorded in TA-170 followed by Flordasun (38.07 g) and the lowest (35.64 g) was observed in Shan-e-Punjab. Similarly, cultivar TA-170 recorded the maximum fruit size with respect to length (5.50 cm) and diameter (4.50 cm). Cultural practices like pruning and irrigation markedly increases the fruit size (Oluch *et al.*, 1993; Mcfadyen, 1996 and Nyambo *et al.*, 2005). It is evident from the data in table 1 that cultivar TA-170 accounted for the maximum yield (15.58 kg/tree) followed by Shan-e-Punjab (14.60 kg/tree) and lowest (13.64 kg/tree) in Flordasun. Similar result was obtained by Jana (2015) under Ranchi condition. Yield is most important parameter for peach production under different soil and climatic condition.

#### (b) Quality attributes of fruits

Table 2 indicated that the total soluble solids content of fruits was highest (17.35 °brix) in cultivar Flordasun followed by Shan-e-Punjab (16.99 °brix) and lowest (15.51 °brix) in TA-170. Acidity on the other hand was lowest in Flordasun (0.27 %) and highest in Shan-e-Punjab (0.32 %). This might be due to water stress and high temperature during harvest. Maximum total sugars (13.71 %) and

reducing sugar (6.67 %) content was found in the cultivar Flordasun and minimum in TA-170. Ascorbic acid on the other hand was highest (76.17 mg/100g) in Shan-e-Punjab and lowest (70.04 mg/100g) in TA-170. Chadha *et al.* (1968) and Edward and Watson (1994) pointed out that fruit quality were generally affected by environment. Several workers have worked on the physico-chemical properties of peach fruits (Kher and Dorjay, 2001; Neelam and Ishtiaq, 2002; Singh *et al.*, 2014 and Jana, 2015) in the past and the maximum variability was observed in peach genotypes prevailed in our country India.

### Acknowledgements

Authors are thankful to Director, ICAR Research Complex for NEH Region, Umiam, for providing all the experimental facilities for successful conduct of the experiment.

### References

- AOAC (1984). Official Method of Analysis. 14<sup>th</sup> Edition, Association of Official Agriculturist Chemist. Washington D. C.
- Chadha KL, Gupta MR and Singh SN (1968). Physico-chemical characters of some peach varieties grown at the regional fruit research sub-station, Bahadurgarh. *Journal of Research* 6(1): 78-81.
- Edward FG and Watson DG (1994). Fact Sheet St-513, A series of the environmental horticulture department, Florida cooperative extension service, institute of food and agricultural sciences, University of Florida.
- Jana BR (2015). Performance of Some Low Chill Peach, [*Prunus persica* (L) Batsch] Under Eastern Plateau Regions of India. *International Journal of Current Microbiology and Applied Sciences* 4(12): 752-757
- Josan JS, Thind SK, Arora PK and Kumar A (2009). Performance of some low chilling peach cultivars under north Indian conditions. *Environment and Ecology* 27(4B): 1923-1926.
- Kher R and Dorjay T (2001). Evaluation of some cultivars of peach under Jammu conditions. *Haryana Journal of Horticultural Sciences* 28(3/ 4): 201-202.
- Kuden A, Imrak B and Rehber Y (2004). Peach, nectarine and plum growing possibilities under subtropical condition of Turkey and North Cyprus. *In: Proceeding: International symposium on temperate zones fruits in the tropics and subtropics*, October 14-18, 2003. Pp. 119-126
- Mcfadyen LM, Hutton RJ and Barlow EWR (1996). Effects of crop load in fruit water relations and fruit growth in Peach. *Journal of horticulture science* 71: 469 480

- Neelam A and Ishtiaq M (2002). Evaluation of different peach cultivars grown under the agro-climatic conditions of Peshawar valley. *Sarhad Journal of Agriculture* 18(1): 31-37.
- Nyambo A, Ruffo CK, Nyomora A and Tengnäs B (2005). Fruits and nuts. Relma Technical Handbook, No. 34. ICRAF.
- Panse VG and Sukhatme PV (1985). Statistical Methods for Agricultural Workers. 4<sup>th</sup> ed, ICAR, New Delhi
- Ranganna S (2004). Handbook of Analysis and Quality control for Fruits and Vegetable Products, 2nd ed., Tata McGraw, Hill Publishing Co. Ltd., New Delhi, India.
- Singh D, Yephthomi G and Kumar K (2014). Performance of some low chill peach, *Prunus persica* (L) Batsch germplasm accessions for fruit quality traits in Himachal Pradesh. *International Journal of Farm Sciences* 4(3): 72-80

**Table 2.** Bio-chemical parameters of different peach cultivars

Variety	TSS (°Brix)	Acidity (%)	Total sugars (%)	Reducing Sugars (%)	Ascorbic acid (mg/100g)
Flordasun	17.35	0.27	13.71	6.67	75.57
TA-170	15.51	0.29	11.03	6.21	70.04
Shan-e-Punjab	16.99	0.32	12.07	6.63	76.17
CD at 5%	0.63	0.05	0.364	0.521	3.503