



Punjab Horticultural Postharvest Technology Centre Punjab Agricultural University, Ludhiana

PHPTC Newsletter

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Message from Chairperson

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The agricultural paradigm is already undergoing a shift with focus on diversified farming away from the traditional cereal farming. Horticulture has emerged as one of the best options for addressing nutritional adequacy, enhancing employment opportunities, farm income, use of natural resources and above all, emerging enterprises. With increase in per capita income and accelerated growth of health conscious population, the demand for horticultural produce is on rise and is further expected to accelerate. But the production has to be competitive both in terms of quality, safety and price for economical marketing. However the major challenge in horticultural crops is their perishable nature. The horticultural crops need proper care and adequate postharvest infrastructure immediately after harvesting to preserve its quality in order to minimize the postharvest losses. If there is glut of perishable produce, that will lead to market collapse and ultimately monetary losses to farmers. Therefore, scientific interventions are needed to cater the aspect of postharvest handling perishable produce. PHPTC is making efforts by acting as a bridge between the farmers and the entrepreneurs by imparting scientific solutions to fill this gap.

Among various horticultural crops of Punjab, Guava is an important fruit crop next to Kinnow. Recently Punjab Government has established Guava Estate at Patiala to boost its production and marketing for the benefit of farmers and processors. Guava is highly nutritious fruit and is good source of ascorbic acid, riboflavin (vitamin B2), vitamin A (beta carotene) and minerals like phosphorus, iron and calcium. The ascorbic acid content in guavas is 4-5 times higher than that of citrus fruits. The current newsletter focuses on various postharvest aspects of guava fruits such as harvesting, grading, packaging and storage etc.

I hope this Newsletter on "Postharvest handling of guava fruits" will further update the knowledge of entrepreneurs and farmers and provide deep insight to its postharvest handling techniques. I convey my best wishes for the success of this Newsletter and hope PHPTC would continue to make efforts to generate innovative postharvest technologies of fruits and vegetables for the benefit of farmers.

POSTHARVEST HANDLING OF GUAVA FRUITS

Guava is an important fruit crop of Punjab and ranks second after Kinnow. Guava grows well in almost all the districts of the state. The important cultivars of guava recommended by Punjab Agricultural University for commercial cultivation in the Punjab state are Allahabad Safeda, L-49, Punjab Safeda, Punjab Kiran, Arka Amulya, Punjab Pink, Shweta.

Nutritional value of Guava*

Name	Unit/100g
Energy	68.0 Kcal
Protein	2.55 g
Fat	0.95 g
Carbohydrates	14.32 g
Fibre	5.4 g
Calcium	18 mg
Magnesium	22 mg
Phosphorus	40 mg
Iron	0.26 mg
Potassium	417mg
Vitamin-A	624 IU
Ascorbic acid	228 mg

*Approximate values, may vary with stage of maturity, cultivar, season etc. (Source: USDA, 2005)



However, owing to faulty handling practices and lack of adequate post-harvest infrastructure, the postharvest losses of fruits are very high. Therefore, it becomes imperative to harvest and handle the fruits with great care, so that postharvest losses are reduced and quality of fresh fruit is maintained during marketing.

Maturity: The harvesting of fruits at optimum maturity is of paramount importance for maintaining the marketable quality of guava fruits. The fruits should be harvested when they attain proper size and light green in colour or just at colour break stage. Generally skin colour is used to measure the maturity and ripeness of the fruit.



Harvesting: The guava fruits must be harvested with care, because of their soft and thin skin. The fruits should not be harvested by pulling from the plant but, they should be harvested with hands by giving gentle twist to the fruits or with scateur. The fruits should be collected properly in cloth bags or plastic buckets to avoid injury or bruising on fruit surface and



thereafter the fruits should be gently transferred from harvest container to a well ventilated plastic crates. After harvesting, the containers should be kept under shade or immediately shift to packhouse in order to minimize moisture loss.

Grading: In packhouse the bruised, diseased or damaged fruit should be sorted out and healthy fruits should be cleaned to remove the dirt and dust particles with help of soft cloth. The fruits should be graded on the basis of their size or weight. Grading of fruit is important to satisfy the consumers and for earning better price in the market. The guava fruits can be categorized into six grades as suggested by Directorate of Marketing and Inspection (DMI).

Size code	Weight (gm)	Diameter (mm)
A	>350	>95
B	251-350	86-95
C	201-250	76-85
D	151-200	66-75
E	101-150	54-65
F	61-100	43-53

Packaging : Packaging plays an important role in maintaining quality of fruits and protect them from adverse weather conditions. The guava fruits apparently free from bruise or diseases should be packed in CFB cartons or plastic crates properly lined with cushioning material for avoiding bruising during transportation. The fruits may be packed in plastic crates or ventilated CFB boxes (4 kg or 10 kg capacity) for easy handling during transportation, storage and marketing.



Storage : The optimum temperature of storage of guava fruits is 6-8°C and 90-95% RH. The fruits can be stored for 2-3 weeks under these conditions with acceptable texture and quality. The storage of guava fruits at temperature below 6°C lead to development of chilling injury symptoms like surface discolouration, pitting and decay.

Ripening : In winter guava, ripening is a problem particularly during December to February when temperature is extremely low and foggy weather prevails. Such conditions interfere with colour and flavour development of the fruits. Therefore the fruits can be successfully ripened with post-harvest application of ethephon 500 ppm (1.25 ml / litre of water). The fruits should be dipped in desired concentration of solution for 2-3 minutes followed by air drying to remove the surface moisture and packed in plastic crates or CFB boxes properly lined with neat and clean papers. The packed fruits should be kept at 20-25°C temperature for adequate ripening. The guava fruits attained uniform colour and acceptable quality within 4-6 days.



Processing: Fresh guava fruit has limited shelf life and therefore, processing is done to increase shelf life and provide year round availability of fruit. As guava is a rich source of pectin, it is mostly employed for jam, jelly and beverage preparation. Currently, most common form of guava consumption in processed form is ready-to-serve drinks using 20-25% guava pulp. Other potential products from guava include candy, wine, preserve and guava powder. Guava pulp can itself be processed and stored to be used as blending material for other type of food products.



Marketing : Farmers are advised to make their own associations and establish postharvest infrastructure such as packhouse and processing unit to market their quality produce. This will help in minimizing their exploitation in the hands of traders.

PHPTC Activities

Training programme for farmers of pear estate: A training programme on postharvest handling and marketing of pear fruit was organized at Amritsar on 29-7-2021 in collaboration with Pear Estate, Amritsar. Dr BVC Mahajan demonstrated the packaging of storage techniques of pear fruits for distant marketing. Dr. G.S. Dhanjal Deputy Director (Hort), Amritsar elaborated about various schemes of horticulture department under MIDH programme.



Training programme for Progressive FPO of Tarn Taran: PHPTC organized a training programme on processing of pear fruits for a 'Progressive FPO' of Khadur Sahib, District Tarn Taran. Ten farmers attended the training course. The farmers were given hands-on-training on preparation of jam, candy and nectar of pear fruits. The programme was sponsored by Chief Agriculture Officer, Tarn Taran under ATMA scheme. Sh Ragbir Singh President of 'Progressive FPO' told that this group was established in 2016 with the support of NABARD. It has about 200 progressive farmers who are actively involved in preparation of various products like multigrain flour, bakery products, honey, jaggery, turmeric powder etc.



Seminars on postharvest handling and export of Kinnow fruits: Two seminars on postharvest handling and export marketing of Kinnow fruits were arranged by Citrus Estate, Bhunga and Abohar on 6-8-2021 and 6-9-2021 respectively. Dr BVC Mahajan apprised the farmers about various export requirements of grading, packaging, precooling and cold chain for export marketing of Kinnow fruits. Sh Shammi Mahajan and Sh Jagtar Singh Asstt Director Horticulture of Citrus Estate Bhunga and Abohar explained about various ongoing schemes of MIDH programme.





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