



Punjab Horticultural Postharvest Technology Centre
Punjab Agricultural University, Ludhiana

PHPTC Newsletter

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POSTHARVEST HANDLING AND MARKETING OF LITCHI FRUITS

Litchi has been identified as an important fruit crop in Punjab. Recently Punjab Government has established Litchi Estate in Pathankot district to boost the production of litchi fruit and its marketing in domestic and distant markets of India and abroad. It is a prominent fruit of India, grown in selective pockets of Bihar, Uttarakhand, West Bengal, Punjab and Himachal Pradesh

In Punjab, litchi is commercially grown in Pathankot, Gurdaspur and Hoshiarpur districts over an area of 2.15 thousand ha with production of about 34.88 thousand MT. Punjab Agricultural University, Ludhiana has recommended Dehradun, Calcuttia and Seedless Late cultivars of litchi for commercial cultivation in the state.

Nutritional Importance: The litchi fruit is highly prized in its fresh form and known for its pleasant flavour and refreshing taste. Fresh nutritive value per 100 gm litchi fruits (Source: USDA, 2019).

Principal	Nutritive Value	Principal	Nutritive Value
Energy	66 K cal	Vitamin-C	71.5 mg
Carbohydrate	16.53 g	Vitamin-E	0.07 mg
Protein	0.83 g	Vitamin-K	0.4 µg
Total Fat	0.44 g	Calcium	5 mg
Cholesterol	0 mg	Potassium	171 mg

Postharvest problems: There are several limitations in litchi postharvest which prevent the industry for further expansion. Short shelf life and postharvest disorders such as pericarp browning, desiccation and decay are some of the prominent hurdles that restrict the growth of the litchi industry. The pericarp browning adversely affects the appearance and consumer acceptability of the fruit and lowers the market value.

The harvesting period of litchi in Punjab coincides with the extreme high temperature and pre-monsoon rains as a result a glut like situation is often witnessed in the market leading to huge postharvest losses. Moreover, short span of harvesting period which lasts for only 3-4 weeks further aggravates this problem.

The tips to maintain good quality of litchi fruits after harvesting are discussed as under:

Harvesting: Litchi is non-climacteric fruit and harvesting is usually done on the basis of visual appearance. In Punjab, Dehradun cultivar ripens in the second week of June and Calcuttia & Seedless Late cultivars during third week of June. These cultivars generally take 55 to 75 days from full bloom to maturity. Litchi fruits are harvested in

bunches along with portion of branch and few leaves. At the time of harvesting, care is taken to harvest the selected bunch, which has attained the desirable maturity as determined by colour development, flattening of tubercles and taste of the pulp. For distant market fruits are harvested when juice TSS attains 17-18° Brix and acidity 0.3 to 0.4 percent. During harvesting fruits should be collected in a manner so that they do not fall on the ground.



Harvesting of Litchi

Precooling: Precooling is a technique which quickly removes field heat of the fruits thereby, slowing down the physiological activities by lowering the respiration rate, retard the incidence of decay, and extend storage life. The principle techniques for precooling include hydrocooling, forced air cooling, evaporative cooling etc. Precooling of litchi fruits before packaging and storage can extend its market value. The pre-cooling treatment is eco-friendly and safe to preserve the quality of fresh litchi fruits

Sorting and Grading: In practice, litchi fruit are graded and marketed on the basis of their diameter or weight. The litchi fruits of 25-30 g are considered top grade. The different grades of litchi suggested by Directorate of marketing and Inspection (DMI) are as under:

Grade	Fruit Diameter (mm)
Extra Class	33.0
Class I	28.0
Class II	23.0



Sorting & Grading of Litchi

Packaging: Litchi is highly perishable in nature and browning of pericarp occurs very fast immediately after harvest due to degradation of anthocyanin and accelerated activity of polyphenol oxidase (PPO) enzyme. Browning of pericarp, substantially limits the marketability of litchi. Although, pericarp browning does not affect the eating quality of the aril but affects the cosmetic appearance of the fruit. The fruits are commercially packed and market in jute sacks (*Palli*), which lowers the market value and shelf life of fruit. Hawkers usually sprinkle water on the fruits to prevent physiological loss of water and discoloration. Sometimes, they cover the fruit with wet gunny cloth or bags.

For retail and whole sale marketing of litchi fruits, the corrugated fiber board (CFB) boxes of 2, 4 and 10 Kg capacities designed by Punjab Horticultural Postharvest Technology Centre (PHPTC) were approved by Punjab Agricultural University, Ludhiana for their commercial adoption by the farmers. The fruits packed in CFB boxes retain

visual appearance, keeping quality and marketability. The strength of CFB boxes should be 3-5 ply. The transportation losses are also minimized with the packing of litchi fruits in CFB boxes. The detail specifications of these boxes are as under:

Capacity of box (Kg)	Dimension of box (mm)
2 Kg	340 mm x 220 mm x 100 mm
4 Kg	340 mm x 220 mm x 190 mm
8-10 Kg	420 mm x 235 mm x 210 mm



Packaging of Litchi in CFB Boxes

Storage: After harvesting the fruits should be stored at appropriate temperature 2-3°C and 90-95% relative humidity. The shelf life of litchi at room temperature is less than 2 days. Since, it is sold at exorbitant price in the market; therefore, it should be stored particularly during glut period for regulating the market supply. It can be stored at 2-3°C and 90-95% relative humidity for 1-2 weeks depending upon maturity level of the fruits and method of packaging etc.

Marketing: Litchi has very short harvesting season of around two months in India coupled with poor shelf life leading to glut and distress sale. In Indian markets, the fruit is traditionally sold in clusters or bunches. Usually, it is transported in baskets or wooden boxes without

any post harvest treatments. The fruit is sold through a post harvest contractor to the wholesale or commission agent, who undertakes the harvesting and packing, in addition to transporting the produce to the market. More than 80 % of the growers prefer sale through post harvest contractors in the region. The potential of litchi in India is unexploited so far. High price disparities exist between the returns that the producers get and the consumers pay. Therefore, self marketing is the best option, for earning better profits. The farmers are advised to form the cooperative groups or farmer producer's organizations (FPO) and create postharvest facilities like pack house and storage infrastructure. Mission for Integrated Development of Horticulture (MIDH) and National Horticulture Board (NHB) provides financial assistance to the farmers' cooperatives for establishment of integrated pack houses, storage and marketing infrastructure. Export of litchi in distant markets can be enhanced by setting up of cold chain infrastructure in the area.



Processing Aspects: Litchi fruit is suitable for processing into various value added products such as squash, ready to serve juice, concentrates and dehydrated litchi juice powder. Apart from this, litchi fruit bars and osmotic dried litchi fruit has the potential to capture snack food market.

PHPTC Activities

1. PHPTC Newsletter released by Sh. Anirudh Tewari, IAS, Additional Chief Secretary (Dev), Punjab.

Sh. Anirudh Tewari, IAS, Additional Chief Secretary (Development) Punjab-cum-Chairman, PHPTC released 16th issue of Newsletter (January-March 2021) in the 45th Meeting of General Body / Executive Committee held on 09-03-2021 at Mini Secretariat, Chandigarh. Chairman advised the PHPTC Scientists to strive hard to develop protocols for postharvest management of fruits & vegetables and provide new business opportunities for entrepreneurs.



2. Visit of Sh. Dharminder Sharma, IFS, Secretary Agriculture, Punjab to PHPTC, PAU, Ludhiana on 16th March, 2021

Sh. Dharminder Sharma, IFS, Secretary Agriculture, Government of Punjab Visited PHPTC, PAU Campus Ludhiana and interacted with scientists. Dr BVC Mahajan, Director of the Centre conducted the visit of Secretary Agriculture to postharvest laboratory, quality control laboratory & moisture meter calibration laboratory and apprised him of various ongoing activities. Dr. Mahajan explained that many

technologies such as ripening of fruits with ethylene gas, storage of potato with CIPC application, waxing of Kinnow and packaging of fruit and vegetables for retail and whole sale marketing have been commercially adopted by farmers and traders. Dr Swati Kappor demonstrated the technology of jaggery and honey based processed Kinnow products. Dr Ritu Tandon and Dr Pooja informed that the Quality Control Laboratory of the Centre is providing water and food testing services to the farmers and industries for the estimation of heavy metals, microbiological and nutritional parameters. The Secretary Agriculture advised the scientists to develop cost effective technologies and disseminate them through outreach programmes so that farmers and entrepreneurs are benefitted.



3. Packhouse Workers Training: Training program for Packhouse Workers was conducted in collaboration with Skill Development Centre, PAU, Ludhiana sponsored by Agricultural Skill Council of India, New Delhi from 01.03.2021 to 26.03.2021. A total of 20 candidates from different regions of Punjab state participated in the training program. The program emphasized on working operations of pack-house with respect to sorting, grading, packaging and storage of fruits & vegetables. Different processing technologies were also discussed. The hands-on-training was provided to the participants for value addition of fruits & vegetables.



4. Exposure Visit of Farmers: Farmers associated with Krishi Vigyan Kendra, Moga under "Kita Mukhi Sikhlay Course" visited the Centre on 08-03-2021. They were made aware about packaging, storage and processing techniques for fruits & vegetables.



5. Visit of Mr. Shankar Oram, MLA, Birmitrapur, Odisha

The delegation comprising of Mr Shankar Oram, MLA, Birmitrapur, Odisha and Tankadhar Podh, CEO Social Action for People, Odisha, visited PHPTC on 02-03-2021. They interacted with the scientists about various postharvest technologies of horticulture crops developed by PHPTC. The team also visited Quality Control Laboratory for estimation of heavy metals and elements in food products. They appreciated the services being provided by the Centre for minimizing the postharvest losses of perishable produce.



6. Nomination of Dr. B.V.C. Mahajan as Special Invitee to Board of Management of PAU

Board of Management at its 301st meeting held on 12-2-2021 has approved the nomination of Dr. B.V.C. Mahajan, Director, PHPTC as Special Invitee to Board of Management of Punjab Agricultural University, Ludhiana for one year.



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