

Punjab Horticultural Postharvest Technology Centre
Punjab Agricultural University, Ludhiana

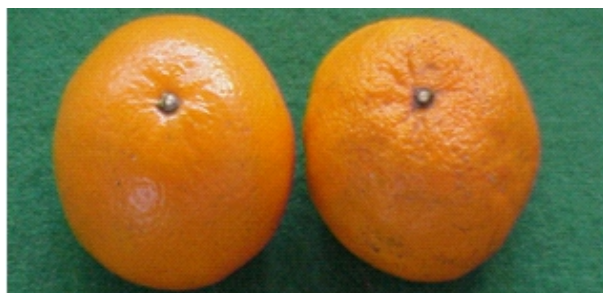
PHPTC Newsletter

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WAXING OF FRUITS AND VEGETABLES

India is the second largest producer of fruits and vegetables after China and produced about 300 million metric tons of fruits and vegetables as per data base of National Horticulture Board published during 2016-17. However due to lack of postharvest infrastructure and cold chain facilities, about one-third of valuable produce goes waste. These percentages are not acceptable and adversely affect the Indian economy. The intercontinental trade in fresh fruits and vegetables is increasing very rapidly. Indian markets have witnessed huge quantity of exotic fruits glowing with wax coatings. Waxing of fruit is an emerging technology which can provide solution to minimize postharvest losses and increase opportunities for distant and export marketing. The other techniques such as right methods of harvesting, packaging, storage systems etc are equally significant in curtailing losses of perishable produce.



Waxed

Unwaxed



Waxed Kinnow and pear fruits



Kinnow washing, grading and waxing lines established by Punjab Agro Industrial Corporation at Hoshiarpur and Abohar

Fruits and vegetables are good source of dietary fibre, vitamins and minerals and form an important part of our healthy diet. However these commodities are highly perishable because they contain 80-90% water. Once these are harvested, the water quickly evaporates leading to loss of cosmetic appearance, nutrients and resulting in poor shelf life of produce. Thus the fresh fruits and vegetables require protective treatments. Chemical fungicides provide the primary means for controlling postharvest fungal decay of fruit and vegetable. However, continuous use of fungicides has faced two major obstacles; increasing public concern regarding contamination of these crops with fungicidal residues, and proliferation of resistance in the pathogen populations.

Now-a-days consumers are more health conscious and demand fresh fruit and vegetable, which have driven researchers to develop eco-

friendly coatings and packaging that prolong the shelf-life of the products. However, there are widespread misconceptions about the waxing of fruits among consumers. Different types of waxes are permitted to be applied on fruits, in accordance to Good Manufacturing Practice or within specified maximum levels in different countries, e.g. Australia, New Zealand, the European Union and the United States.

The Food Safety Standard Authority of India (FSSAI) under section 2.3.6 of Food Safety and Standards Regulations, 2011 has approved three wax coatings viz Shellac, Carnauba and Beeswax for application on fruits and vegetables. Some of the fruits and vegetables which can be coated are apple, Kinnow, lemon, lime, orange, pear, mango, bell-pepper, cantaloupe, squash, cucumber, tomato etc. Shellac is a resin secreted by the female lac bug on trees. Carnauba wax is obtained from the leaves of the carnauba palm. Beeswax is a natural wax produced by honey bees. All these waxes are processed as dry flakes and dissolved in organic solvents to make liquid for further application on horticultural produce.

Waxing technique is commonly used in developed countries and in some countries it is mandatory as quality assurance treatment for export marketing. Wax coatings used on fruits and vegetables must meet the FSSAI regulations for safety. Produce shippers, traders and supermarkets are required to label fresh fruits and vegetables that have been waxed.

The purpose of waxing: The fruits and vegetables have a natural wax coating which develops during the maturation and the ripening process. However, the natural shield is destroyed during harvesting and postharvest operations such as washing, grading, packaging, transportation etc leading to bruising and decay of fruits and vegetables. Waxing acts as moisture shield and provides protection against pathogens and minor mechanical damage to fruits and vegetables. The application of wax coatings not

only reduce water loss through transpiration but minimize the respiration rate thus slow all the biological system of perishable produce which are dependent on oxygen. With slower respiration rate, the ripening process is delayed and thus, the fruit remains firm, fresh and nutritious for longer period with better shelf life. The wax coating when applied on fruits and vegetables form an odourless, tasteless membrane which creates a modified atmosphere around each fruit resultantly the freshness and quality of produce is preserved for longer period than the unwaxed ones.

Waxing can be done in several different ways, ranging from manual rubbing of the product surface gently with the help of soft cloth or cushioning materials drenched with wax materials, or submergence in wax, to automated roller brush application. During the process, only a tiny amount of wax is required to provide a microscopic coating surrounding the entire crop. In general, each piece of waxed produce has only a drop or two of wax. Nonetheless, waxing does not improve the quality of inferior products. Heavy application of wax may, on the contrary, adversely affect the quality of fruits by blocking the fruit gas exchange, leading to the development of off-flavours.

In Punjab about six commercial automated mechanical waxing and grading lines for Kinnow fruits have been established by Punjab Agro Industrial Corporation and about hundred such automatic lines have been established by progressive farmers and commission agents at Kinnow growing areas of Abohar, Fazilka and Hoshiarpur. Similarly in Himachal Pradesh and Jammu & Kashmir also the waxing and grading lines have been installed by government and private agencies for waxing and marketing of apple.

In Punjab, kinnow growers are commercially using citrashine wax (shellac) for improving shelf life and quality of kinnow fruits during marketing. The application of citrashine wax on kinnow fruits has been recommended by Punjab Agricultural University, Ludhiana.

Many fruit retailers rub fruits and vegetables with piece of cloth drenched with some sort of oils or lubricants to improve glossiness and appearance. This practise by small vendors or traders should be strictly checked as Food Safety Regulations do not permit the use of non edible chemical compounds.

Fruits coated with food grade waxes approved by FSSAI are generally safe to eat. To enjoy the benefits of consuming fresh fruits, always purchase them from reliable shops and wash them thoroughly under running tap water before peeling, cutting and eating.

PHPTC Activities

PHPTC Newsletter : Sh. Viswajeet Khanna, Additional Chief Secretary (Development)-cum-Chairman, PHPTC and Dr. Baldev Singh Dhillon, Vice Chancellor, PAU, Ludhiana released Seventh issue of PHPTC Newsletter (July to September, 2018) during its 40th Meeting of Executive Committee held on 27-9-2018 at Mini Secretariat, Chandigarh.



Training Programmes on Postharvest Management of Horticultural Crops : Punjab Horticultural Postharvest Technology Centre (PHPTC) will organize 12 training programmes for farmers of Punjab from November 2018 to February 2019 in collaboration with Directorate of Horticulture, Government of Punjab. In each training programme a group of 25-30 farmers from each district will be trained. These training programmes will cover wider aspects of different techniques involved in

harvesting, precooling, grading, packaging, storage, marketing and food safety regulations of perishable produce. PHPTC has already organized six training programmes for farmers from Jalandhar, Kapurthala, Mohali, Ropar, Amritsar, Tarantaran, Faridkot, Shri Muktsar Sahib, Ludhiana, Moga and Hoshiarpur.



Skill Training for Rural Youth: PAMETI and PHPTC jointly organized three days training programme named Skill Training of Rural Youth operationalized by National Institute of Agricultural Extension Management, Hyderabad from 17-9-2018 to 19-9-2018. 15 participants attended the programme.



Calibration of Grain Moisture Meters: PHPTC calibrated 1917 moisture meters of Punjab Mandi Board and 70 moisture meters of FCI, Warehouses and Sheller Owners.



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Paddy Testing Machine
(Model No-STE-05)



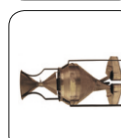
Lab Rice Length Grader
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Lab Paddy Dehusker
(Model No-STE-07)



Lab Rice Polisher
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