

Shrink-wrapping Technology for Pomegranates

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Pomegranate is an important fruit crop of arid regions. It is a rich source of phenolics and antioxidants, which protect us from several ailments. Its area is increasing day-by-day in different parts of our country, and now it has come up as a highly remunerative cash crop in Himachal Pradesh. Several varieties are being grown there but ‘Kandhari’ and ‘Bhagwa’ have excelled over other varieties. The shelf life of pomegranate is quite high, still there is a great scope to enhance its availability for the longer period to fetch higher price during the lean period of the year. In this direction, Division of Food Science & Postharvest technology, IARI, New Delhi-12 has standardized a simple technique for extending the postharvest life of ‘Bhagwa’ and ‘Kandhari’ pomegranates for the benefit of the pomegranate growers.

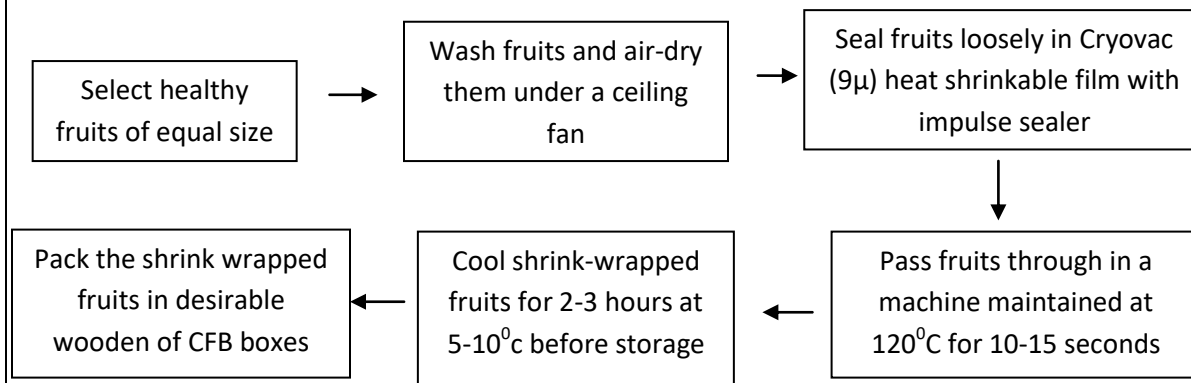
Shrink-wrap packaging is a new technique for post harvest handling of fruits and vegetables. The technology delays physiological deterioration of fruits and also prevents condensation of droplets within the package. Individual shrink-wrapping of the produce provides optimum gas and humidity for maintaining quality of the produce during the transit and storage. As a result, it doubles or sometimes triples storage life of the fruits under proper storage conditions. Such unit packs also provide protection against abrasion and maintain attractive appearance of the product.

The technology

This technique involves over-wrapping of the produce with heat-shrinkable films of the desirable thickness with the help of a machine. For individual shrink-wrapping, initially individual fruit is loosely packed and then sealed in a desirable heat-shrinkable film (9µ) with the help of an impulse sealer. The produce is then placed inside the machine where the temperature is maintained at 120⁰C or so. Then upper cover of the machine is pressed for 10-15 seconds to activate fan, which circulates hot air around the produce, and the film shrinks tightly around the produce. In case of tray-wrap packaging, produce is first sealed in a consumer pack of suitable size and then passed through the machine. Shrink-wrapped produce is immediately removed

from the machine and cooled for 2-3 hours at 5-10⁰C. Finally, the produce can be packed in plastic crates for further storage or transportation.

Steps in Shrink-wrapping



Physico-chemical composition of pomegranate at room temperature

Attribute	Kandhari		Bhagwa	
	No-wrapped	Wrapped	Non-wrapped	Wrapped
Loss in weight (%)	27.2	1.49	21.8	2.69
Weight of 100 arils (g)	41.3	42.6	30.4	32.8
Juice (%)	46.3	71.4	49.2	71.0
TSS (%)	13.2	14.8	13.7	15.3
Total peholic contents (mg/ 100 ml GAE)	19.9	28.8	22.4	37.1
Total anthocyanin contents (mg/L)	285.7	337.5	367.9	435.6
Antioxidant capacity (µmoles Trolox/ml)	9.8	13.6	11.4	17.4

Costs & benefits

The cost of the shrink-wrap packaging varies with the commodities to be wrapped or type of film to be used for wrapping. In practice, the cost for wrapping one kilogram (2 fruits) is nearly Rs. 0.80-1.00. This cost can be further reduced by tray-wrap packaging where 2-4 fruits are packed per pack.

Shrink-wrapped pomegranates

Advantages

The advantages of shrink wrapping are as under:

- Enhances the shelf-life of pomegranate by about 20 days without affecting quality.
- Develops attractive colour and appeal of pomegranates
- Shrink-wrapped pomegranates produce high amount of juice and have high total phenolics and antioxidants, which are considered good for health.
- Simple and user-friendly technology.
- Can be very well adopted by small and marginal farmers/ or entrepreneurs.
- It adds very marginal cost to the produce.
- Machine used for shrink-wrapping of pomegranates, can also be used for several other commodities. Thus, year-round production of shrink-wrapped produce is possible.
- Shrink-wrapped pomegranates are hygienic and free from dust and dirt.
- Shrink-wrapped pomegranates are convenient to handle during storage or transportation.
- Avoids further infection and delays deterioration of the produce during long-term storage.

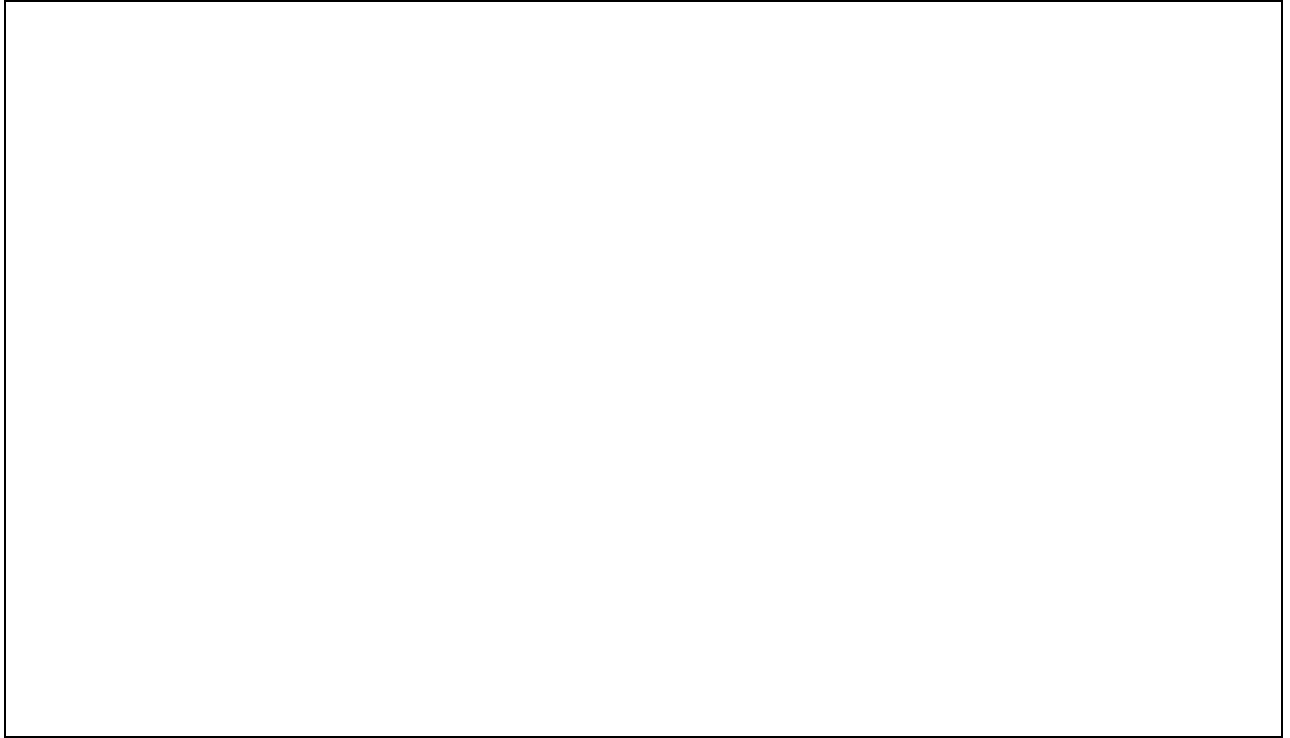


(a)

(b)

Appearance of (a) Shrink-wrapped and (b) Non-wrapped) Kandhari pomegranates after 50th day of storage at ambient conditions

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