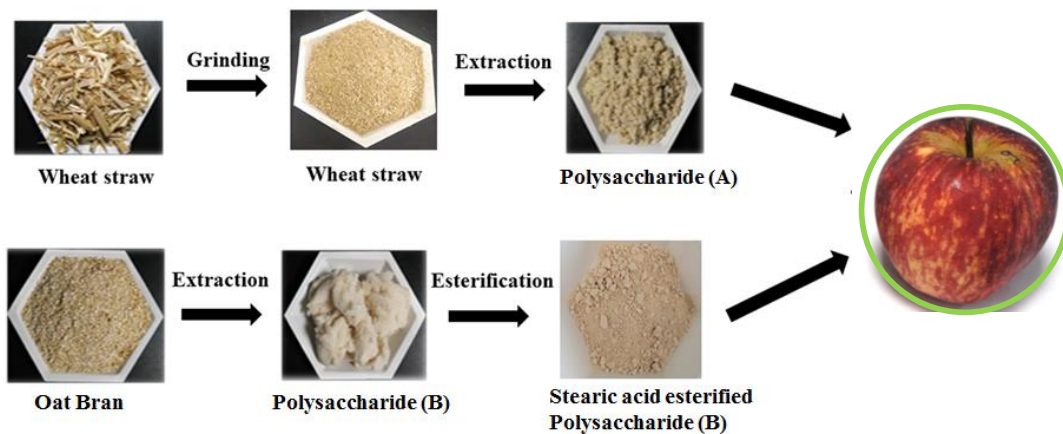


## Edible coating materials to improve shelf life of fruit crops

Fruits are one of the most important horticulture commodities worldwide due to its organoleptic and nutritional properties. In India, the diverse agro climatic zones ensure availability of all varieties of fresh fruits & vegetables. India ranks second in fruits production in the world after China. As per National Horticulture Database published by National Horticulture Board, during 2016-17 India produced about 300 million metric tonnes of fruits and vegetables.

However, fruits are highly perishable commodity as they contain 80-90% water by weight. The water quickly begins to evaporate, if fruits are left without cuticle, resulting in poor product shelf life. The post-harvest losses recorded during previous decades are alarming. Absence of postharvest treatment, traditional storage on farms, infestation of microorganism and pests, and non-availability of processing methods are responsible factors for the high rate (about 25-30%) of postharvest losses in fruit and vegetable in India. Due to limited availability of cold chain facilities especially during storage and transportation, development of coating materials to prolong the shelf life of fruits and vegetables is the high priority in this research area.

The present invention relates to development of non-toxic and edible composite coatings based on wheat straw hemicellulosic polysaccharide (WP) and stearic acid derivatized oat bran polysaccharide (SAOP).



### Polysaccharides extracted from (A) Wheat straw and (B) Oat bran for coating applications.

The 1-2% WP-SAOP composite emulsion (w/w 60:40) was further used for surface coating on various perishable fruits (Apples, Peaches and Bananas). The determination of the post-harvest qualities of the coated fruits (Apples, Peaches and Bananas) suggested 1-2% WP-SAOP coating formulation significantly reduced fruit weight loss, softening, delayed ripening and maintained sensory qualities compared to non-coated fruits. The WP-SAOP coating formulation has the ability to extend the post-harvest quality of Apple (*Royal Delicious* and *Rich Red*, Kinnaur) for up to or more than 30 days at 22-24°C. Further, the coating formulation extended the shelf life of Peach up to 6-8 days and Bananas up to 9 days without significant blackening under ambient

storage. The coating technology is simple, cost-effective and edible coating material has potential as an alternative to commercially available animal based shellac coating in India.



**A**  
**B**

**Un-coated peaches (A) and coated with 1% NABI coating (WP-SAOP, B) after 6 days at 20°C and 80% relative humidity.**



**A**  
**B**

**Un-coated apples (A) and coated with 1% NABI coating (WP-SAOP, B), 30 days storage**

An Indian patent (Indian Patent Application No 201811032781) has been filed on the developed coating formulation and non-disclosure agreement (NDA) has been signed with R.G. Industries, New Delhi for commercialization of the technology.

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