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Organic coatings as a short term intervention for extending shelf life of fruits / vegetables

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Abstract

Post-harvest losses are significant in our country, due to minimal organised collection / transport facilities and cold chains. Hence, during times of bumper harvest, farmers often resort to distress sales, due to lack of suitable support systems in this regard.

In as early as 12 century AD, the Chinese reportedly applied wax coatings on oranges and lemons. An off-shoot of modified atmosphere packaging, fruit coating technology has progressed over time, utilising materials ranging from waxes, resins, sucrose fatty esters, proteins (zein) and more recently, chitosan. However, there is no general-purpose coating which can be universally applied on any fruit / vegetable. Similarly, horticultural produce also have their individual requirements, such as colour loss, early ripening / maturing, shrivelling (weight loss), pathogenic attacks, flavour loss etc. Each issue has to be addressed individually and specifically. Inappropriate coating may result in undesirable off-flavours due to anaerobic respiration, flesh break down, and complete inhibition of ripening in some climacteric fruits.

IINRG has been successful in developing edible coating formulations and protocols for a wide range of fruits (including spices) and vegetables. These include pointed gourd, tomato, capsicum, *kinnow*, Nagpur mandarin, apples, pear, peach and pomegranate. Spices responding well to coating include black pepper, coriander and cumin. Work is progressing on ginger and mango. As a thumb-rule, coating doubles the notional shelf life of produce. It also inhibits pathogenic attacks during ambient storage conditions. This paper aims to describe some of the experiences and research achievements of IINRG in this field of research.

Biography

PC Sarkar completed his MS (Organic Chemistry) from Lucknow University in 1983 and subsequently obtained his doctorate from Ranchi University. He has more than 27 years of research experience on fundamental and applied studies of lac resin, including its application as a coating material on diverse substrates. He has published more than 50 research papers on synthetic chemistry, organic coatings technology and organic spectroscopy, especially FT-IR. His current research interests include the use of lac resin and gum arabic in post harvest technology of fruits, vegetables and spices.