

# Strawberry Packaging in Plastic Punnets: An Economical and Effective Technology to Improve Food Safety and Profitability



## Raheel Anwar

Institute of Horticultural Sciences,  
University of Agriculture, Faisalabad



Malnutrition and food insufficiency are two of the major issues in Pakistan. To tackle these challenges, there is need to secure availability of nutrient-rich food crops. Since, strawberry is a natural and scrumptious source of phytonutrients including minerals and antioxidants, its demand is increasing in local markets and Pakistan's area under strawberry production is growing rapidly. Previously, it had been cultivated mainly in Swat areas of Pakistan but for the last few years, its cultivation is also being practiced across the river belt areas of Punjab and Sindh. With an annual growth in its production volume, it is now important to secure its availability and fruit quality by improving its supply chain. Strawberry is a delicate fruit and cannot withstand long enough against rapid fruit weight loss, mechanical injuries and fruit decay. In our local supply chain, strawberries are generally packed in 10-12 kg mulberry/plastic baskets, lined with newspaper, cushioned with weed straw and wrapped in fertilizer/cloth bags (Figure A). This practice is one of the major factors responsible for around 40% loss of strawberry fruit just during farm to wholesale market. Moreover, such packaging material also occupies larger space and need racks to avoid compression damage during bulk transport (Figure B). Thus, development of economical and effective packaging is imperative to ensure delivery of fresh and safe strawberries in local supply chain.

Postharvest Research and Training Center at Institute of Horticultural Sciences, University of Agriculture Faisalabad has recently initiated set of studies to optimize strawberry fruit packaging. Initial studies have indicated significant reduction in postharvest losses in strawberries packed in  $\leq 1$  kg plastic punnets compared to those densely packed in 10-12 kg mulberry/plastic baskets. This reduction in loss is due to the fact that small volume of fruit packed in plastic punnets (Figure C) remains safe from compression and impact damage as observed in mulberry/plastic baskets. These plastic punnets can be packed in larger cardboard or plastic boxes for easy and safe handling during bulk transport (Figure C, D). Secondly, compared to air tight mulberry/plastic baskets, perforations in plastic punnets (4-8 holes per pack) allow sufficient exchange of air for aerobic respiration and reduce accumulation of moisture that invites fungal infection. Since strawberry is a delicate fruit, commercially adapted bulk packaging and repeated physical contacts by harvester, packer, whole seller, retailer and consumer results in fruit damage and quality loss. On the other hand, in-

field packing of strawberry fruit directly in plastic punnets immediately after harvest reduces chances of physical contacts and thus maintains fruit quality and quantity. Since, consumers prefer economy packs (around 1 kg), small size plastic punnets are ready-to-sell and reduce repacking hassle by retailers. Visible strawberries inside clear plastic punnets further reduce physical inspection by consumers for selecting damage- and infection-free packs.

Plastic punnets are cheaper (Rs.  $\geq 6$ /punnet) and widely available in variety of shape, size and strength. Even though, optimization studies are still underway at Institute of Horticultural Sciences, UAF to standardize aforementioned strawberry packaging protocol into a viable commercial technology but initial findings are encouraging and support the positive outcomes of this technology alongwith cold chain management of strawberry fruit. Reduction in postharvest losses and improvement of fruit quality may further help to increase profitability and reduce malnutrition-related issues in the country.



**Figure:** Strawberries are commercially packed and transported in 10-12 kg mulberry/plastic baskets (a, b) which is one of the major cause of high postharvest losses in strawberries. Whereas, packing strawberries in  $\leq 1$  kg clear-plastic punnets (c, d) is an economical and effective alternative technology which holds potential in ensuring fruit safety and freshness, and enhancing consumer acceptability and stakeholder's profitability.