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Strategies to reduce food waste – a case study in India avoiding bruises on apples by optimising orchard management

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Abstract

Reduction of food waste not only helps to reduce greenhouse gas emissions (GHGs) on a global scale, but also incorporates many steps along the supply chain. The review and study is based on several visits on-site which identified potential causes food waste.

Mechanical damage such as bruises of apples (*Malus domestica* Borkh.), which can result in considerable wastage and decline in quality, is a major problem of the apple industry. The extent of the mechanical damage depends on pre-harvest, harvest, and postharvest management. Bruises are often caused pre-harvest and only become visible postharvest. This contribution attempts to review bottlenecks of bruise development along the supply chain and identify countermeasures. Improper handling from harvest to retail has a high potential to cause bruises. In India, the fifth-largest apple producer in the world with more than 2 mil t per year, farmers and the apple industry are in a continuous process of reducing losses caused by mechanical damage. This overview explains the formation and development of bruises, followed by the causes of mechanical damage. Opportunities to reduce or avoid bruises along the whole value chain are described with particular regard to the situation in India. This includes pre-harvest management factors such as crop load management, water availability, and nutrient availability as well as the harvest management factors maturity stage, harvest time during the day, harvest method, packing and transport of the apple bins out of the orchard. The final part focuses on postharvest management practices with the themes precooling, hygiene, chemical treatment, grading, storage, packing, loading and unloading, stacking, transport, resorting, and retail.

Keywords: Apple, bruise, consumer, food, food waste, India, orchard management, supply chain