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Editorial: Physical methods for preventing postharvest deterioration

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The Food and Agriculture Organization has reported that approximately one third of the food produced annually (1.3 billion tons) is wasted. Losses and waste per year are close to 20-30% for oil seeds, cereals, meat and fish and 40% for root crops, fruits and vegetables. Postharvest losses are a global shame considering that 870 million people are undernourished and millions of others suffer from nutrient deficiencies. The future scenario is also predicted to be challenging since the rise in the world's population to nine billion by 2050 will further increase food demands. Improved postharvest management and processing will be needed to reduce losses of the increasingly valuable harvests.

Climate change is expected to bring warmer temperatures, changes to rainfall patterns, and increased frequency/severity of extreme weather. This may impact both food production and stability. Fruits and vegetables that fail to reach consumers have significant environmental effects. Taken together the global greenhouse gas emissions from wasted food (from landfills, emissions occurring during production, distribution, and refrigeration) would be in third place if considered a nation. The land footprint of food wasted represents an area larger than that of China and the ground- and surface-water (blue footprint) used to produce wasted food would cover the personal needs of 2 billion people. While large efforts on responses to climate change have been oriented towards increasing crop acclimation to the expected restrictive plant growing conditions, marked improvements of the still weak postharvest management chains seems unavoidable.

The main losses during postharvest are due to fungal, bacterial or insect pests. Many of the chemicals that have been used in the past to control these pests have been removed because of ecological or human health concerns (retention of residues in the environment or on the commodities). New compounds that are more environmentally friendly have not replaced all those which have been proscribed, and much research is being conducted on the use of physical treatments to replace or reduce the chemical treatments.

Another cause of loss is improper temperature management. If the temperature is not reduced a fruit or vegetable will ripen or senesce rapidly, while if the temperature is too low many commodities will develop chilling injury and be sensitive to fungal invasion. Giving a commodity a physical treatment either before or during storage can help prevent the development of chilling injury.

By compiling the contribution of well-known experts in the field, and without pretending to be exhaustive, this issue aims to serve as an updated reference material presenting the most recent advances and current challenges on ***"Physical methods for preventing postharvest deterioration".***

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Guest Editors

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