

# Advances in vacuum ultraviolet photolysis in the postharvest management of fruit and vegetables along the value Chains: a review

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## Abstract

Postharvest losses and quality changes of fruit and vegetables, along the value chain, are a result of microbial activity and negative impacts of ethylene. It has become important to develop technologies that can remove ethylene while simultaneously resisting bacteria to reduce postharvest losses. Various technologies have been successfully developed and applied for the management of ethylene along the postharvest value chain, but there are still some inherent drawbacks that affect their effectiveness, and their ability for antimicrobial activity has been rarely reviewed. Vacuum ultraviolet (VUV) photolysis is an emerging technology with promising characteristics for ethylene and microbial management. This technology relies on the generation of highly reactive radicals that can oxidise ethylene to carbon dioxide and water while simultaneously inactivating pathogenic microorganisms. This paper presents a critical review of VUV photolysis as an alternative technology in postharvest ethylene management. Mechanisms of VUV photolysis action against ethylene and microbial activity, as well as the factors affecting its efficiency, were discussed. Additionally, the impact of UV irradiation on microbial load and fruit enzymes associated with textural quality and antioxidant protection was highlighted.