

Quality response of minimally processed ‘Alphonse Lavallée’ table grapes during cold storage as influenced by preharvest sustained deficit irrigation and postharvest UV-C irradiation

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Abstract

The postharvest life of table grape is restricted by quality deterioration from harvest to retail, mainly due to water loss, accelerated berry softening, pathogen attract and senescence. Preharvest cultivation practices, as well as postharvest treatments, are effective on postharvest life of the grape. Remarkable part of the grapevines experience seasonal or long term drought stress across the world. Therefore, the present study was conducted to reveal the quality response of stem detached berries of ‘Alphonse Lavallée’ table grapes during cold storage as influenced by preharvest sustained deficit irrigation (DI) and postharvest UV-C irradiation as non-chemical disinfection method. The soilless grown experimental grapevines in protected cultivation were divided into two lines as full irrigation (maintaining the substrate water holding capacity at 100%) and DI (fifty percent of FI) sustained during the vegetation in glasshouse. The representative berries from each irrigation practices were stored with or without UV-C postharvest irradiation at 1 ± 0.5 °C, 80–90% RH during 21 d. Berry visual quality did not change up to the 14th d of storage across the grapes, while the berries underwent noticeable decreases in visual quality after the 14th d, except for FI plus UV-C treatments. UV-C helped to maintain the moisture content and skin rupture force of the stemless berries during the storage. Color, SSC, acidity and pH values of the stored berries did not display considerable response to UV-C. In certain cases, antioxidant and total phenol were considerably higher in the must of the berries subjected to UV-C. Overall, postharvest UV-C irradiation retained the loss in physical and biochemical properties of minimally processed table grape and thus it would be recommendable for both DI and FI grapes.