

Title Effects of high O₂ levels on post-harvest quality and shelf life of table grapes during long-term storage

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Abstract

Freshly harvested Kyoho table grapes (*Vitis vinifera* × *V. labrusca*) were stored in controlled atmospheric chambers, either in air, 80% O₂, or 40% O₂ + 30% CO₂, for up to 60 days at 0 °C in 95% relative humidity followed by 5 days in air at 20 °C. Physical and chemical properties were recorded initially and at 15-day intervals during storage. Storage in 80% O₂ or 40% O₂ + 30% CO₂ improved berry hardness, springiness, chewiness, flavors and membrane integrity over control stored in air. In addition, these high O₂ storage conditions significantly reduced fruit decay, berry drop, rachis browning and weight loss, delayed the decrease of soluble solids, titratable acidity and ascorbic acid of table grapes, compared with storage in air. Treatment in 80% O₂ resulted in a significantly firmer berry, better texture, berry adherence strength, and sensory scores than those treated with 40% O₂ + 30% CO₂, but did not significantly affect cohesiveness, springiness, aroma and membrane integrity. Data obtained in this study suggest that high oxygen treatment improve the quality of table grapes and extend its shelf life.