

Title Preharvest applications of growth regulators and their effect on postharvest quality of table grapes during cold storage

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Abstract

Over 54,600 ha of table grapes (*Vitis vinifera*), mainly cvs. ‘Thompson Seedless’, ‘Flame Seedless’ and ‘Redglobe’, are planted in Chile. Almost the entire production is exported to the USA, Europe, Asia, or one of several Latin American countries, which typically requires 15–40 d of maritime transportation. During this period, several physical, physiological, and pathological factors cause table grape deterioration. Because berry size is the main quality factor in international markets, farmers often overuse the growth regulators, gibberellic acid (GA₃) and forchlorfenuron (CPPU), in an effort to increase berry size. We examined the effect of preharvest growth regulators on seedless (‘Thompson Seedless’, and ‘Ruby Seedless’) and seeded (‘Redglobe’) table grape cultivars during cold (0 °C) storage plus a shelf life period of 3 d at 20 °C. The overuse of GA₃, eight instead of two GA₃ applications on Thompson Seedless, and the use of one GA₃ application on Redglobe and ‘Ruby Seedless’, increased berry pedicel thickness and lowered cuticle content but induced shatter and predisposed grapes to gray mold caused by *Botrytis cinerea*. In contrast, CPPU increased berry pedicel thickness and cuticle content but did not increase shatter or gray mold incidence. Clusters that were subjected to overuse of combined GA₃ and CPPU were highly sensitive to shatter, had the thickest pedicel, and developed a high gray mold incidence during cold storage. Hairline, a fine cracking developed during cold storage, was induced on ‘Thompson Seedless’ and ‘Ruby Seedless’ by growth regulators, but no hairline occurred on ‘Redglobe’ table grapes. Therefore, berry quality during cold storage is greatly influenced by growth regulator management in the vineyard.