

Abstract

Postharvest diseases are the most important factors that limit commercial export of Chilean table grapes (*Vitis vinifera*). In recent years, blue mold decay caused by *Penicillium expansum* has frequently appeared on Red Globe (RG) grapes after long term (>60 days) cold storage, causing important economical losses. Isolates of *P. expansum* obtained from grapes were pathogenic and the susceptibility of grape berries cvs. RG and Thompson Seedless (TS) increased markedly as the soluble solids concentration (SSC) increased from approximately 4–20%. However, higher SSC appeared to limit blue mold development on RG grapes. On detached berries inoculated with *P. expansum*, fludioxonil (200 mg L⁻¹) or cyprodinil + fludioxonil (250 + 170 mg L⁻¹) completely controlled it, while cyprodinil (330 mg L⁻¹) reduced it by 87.6%. On detached berries inoculated with *B. cinerea*, applications of cyprodinil (330 mg L⁻¹) or cyprodinil + fludioxonil (250 + 170 mg L⁻¹) completely controlled it, while fludioxonil (200 mg L⁻¹) reduced it by 37.5%. Fenhexamid (400 mg L⁻¹) was 100% effective against *B. cinerea* but ineffective against *P. expansum*. After vineyard applications of an aqueous spray or dust of cyprodinil + fludioxonil (375 + 250 g i.a. ha⁻¹) 24 h before harvest, significant ($P < 0.05$) reductions in postharvest decay were obtained during 30 days storage of the grapes at 0 °C. The postharvest incidence of *P. expansum* and *B. cinerea* was effectively reduced on packaged RG treated with either 0.85 g kg⁻¹ Na₂S₂O₅ (G1, SO₂-generating pad) or 1.22 g Na₂S₂O₅ kg⁻¹ (G2, SO₂-generating pads). Similar results were obtained on Flame Seedless (FS) and TS grapes using SO₂-generating pads G1 and G3 (1.22 g kg⁻¹ Na₂S₂O₅). These SO₂-generating pads were placed inside a polyethylene bag with either 0.3 or 2% vented area. Regardless of the proportion of vented area, the effect of SO₂-generating pads lasted for over 45 days. There were no significant differences between SO₂-generating pads to control *P. expansum*; even on RG with treatment G2 where a higher content Na₂S₂O₅ per box was attained compared with G1. Otherwise G2 was considerably better than G1 to control *B. cinerea* on RG table grapes stored for 90 and 120 days. Berry injuries were considerably higher when the G2 SO₂-generating pad was used but were reduced when the fruit was packaged in a more ventilated bag (2% vented area). Our results demonstrated that both preharvest fungicide applications and SO₂, applied as SO₂-generating pads, effectively reduced decay of table grapes caused by *P. expansum* and *B. cinerea* in long term cold storage.

