

## Biological indicators to estimate the prevalence of gray mold and hairline cracks on table grapes cv. Thompson Seedless after cold storage

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### Abstract

Gray mold caused by *Botrytis cinerea* and hairline cracks are the major cold storage deterioration problems of table grapes (*Vitis vinifera*). Currently, table grapes are treated with sulfur dioxide (SO<sub>2</sub>), but this treatment does not sufficiently and consistently control *B. cinerea*. This is probably associated with latent infections that are poorly controlled with SO<sub>2</sub>, and to the increased berry propensity to develop hairline cracks following SO<sub>2</sub> treatment. Therefore, the objective of this work was to obtain an early biological indicator to segregate grape lots at harvest to later develop according to the potential gray mold and hairline cracks. In this study, it was possible to distinguish gray mold infections at the stylar end, cheek, and base of the berries. However, on commercial SO<sub>2</sub>-treated lots of 'Thompson Seedless' table grapes, the occurrence of gray mold after cold storage was best predicted ( $Y = 0.45X$ ,  $R^2 = 0.84$ ,  $P < 0.001$ ) by the number of gray mold infections that developed at the base of the berry of surface-disinfected (100 L L<sup>-1</sup> SO<sub>2</sub> for 1 h) grapes that were incubated at harvest in humid chambers (100% relative humidity) for 2 d at 0 °C then 5 d at(C) 20 °C. Similarly, the occurrence of hairline cracks after cold storage was best predicted ( $Y = 1.48 + 0.51X$ ,  $R^2 = 0.66$ ,  $P = 0.0002$ ) by the number of hairline cracks induced at harvest by dipping berries in 0.1 mol L<sup>-1</sup> citric acid, pH 2, for 3 h at(C) 20 °C, and stained with 0.1 mol L<sup>-1</sup> methylene blue for 30 s at(C) 20 °C. At harvest, cuticle content and porosity also predicted the occurrence of hairline cracks after cold storage. However, the cuticle content at harvest did not significantly predict gray mold occurrence at the berry base after cold storage. The occurrence of gray mold in commercial SO<sub>2</sub>-treated lots after cold storage was predicted by the prevalence of gray mold at the berry base at harvest. Similarly, the occurrence of hairline cracks after cold storage was predicted by the ability to induce hairline cracks at harvest by acidic pH. Further refinement in this research is needed before using these biological indicators to segregate table grape lots commercially. (C) 2008 Elsevier B.V. All rights reserved.

### Keywords

*Botrytis cinerea*, Decay, Forecasting, 'Thompson Seedless', *Vitis vinifera*.