

**Title** Evaluation of the use of sulfur dioxide to reduce postharvest losses on dark and green figs  
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### Abstract

Postharvest diseases limit the storage period and market life of fresh figs (*Ficus carica* L.). The objective of this work was to determine the effect of sulfur dioxide (SO<sub>2</sub>) applied by fumigation and/or by dual release SO<sub>2</sub> generating pads on postharvest decay and quality retention of 'Black Mission' and 'Brown Turkey' (dark skin), and 'Kadota' and 'Sierra' (green skin) figs. A protocol for the computer-controlled application of gaseous SO<sub>2</sub> has been developed which allows the application of very low specific concentration × time products of SO<sub>2</sub> and simultaneous monitoring of the application progress. In vitro tests with important fungal, yeast and bacterial postharvest pathogens plated on Petri dishes and exposed to a SO<sub>2</sub> concentration × time product (C × t) of 100 (μL/L) h at different temperatures showed fewer survived at 20 °C than at 0 °C. Therefore, fumigations were carried out at 20 °C in the rest of the experiments. The evaluation of different SO<sub>2</sub> concentration × time products showed that a product of 25 (μL/L) h provided the best compromise between decay control and fruit injury. The performance of SO<sub>2</sub> fumigations on warm or cold fruit, its combination with SO<sub>2</sub> generating pads, and the use of repeated fumigations during cold storage were also evaluated. All the SO<sub>2</sub> treatments tested reduced the percentage of decay, extending the market life of fresh figs. However, in some cases, the use of SO<sub>2</sub> generating pads increased the incidence of skin bleaching. Fumigation of warm fruit at 25 (μL/L) h of SO<sub>2</sub> reduced populations of *Alternaria* and *Rhizopus* spp. growing on the fig surface. The treatment was more effective against *Rhizopus* spp. than against *Alternaria* spp. Contamination of fruit by *Botrytis* spp. and *Penicillium* spp. was also reduced by SO<sub>2</sub>. In conclusion, results showed that SO<sub>2</sub> can be a potential tool to control postharvest rots and therefore increase the market life of fresh figs.