

**Title** Control of postharvest diseases of fruit with an invert emulsion formulation of *Trichoderma harzianum* Rifai

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**Citation** Postharvest Biology and Technology, Volume 43, Issue 1, January 2007, Pages 143-150

**Keywords** Postharvest pathogens; *Trichoderma harzianum*; *Rhizopus stolonifer*; *Botrytis cinerea*; *Penicillium expansum*; Invert emulsion formulation

### Abstract

Control of primary postharvest diseases caused by *Rhizopus stolonifer*, *Botrytis cinerea*, and *Penicillium expansum* on a variety of fresh fruit was evaluated with an invert emulsion formulation of *Trichoderma harzianum*. Diseases evaluated were quantified by the period of protection conferred by the antagonist and the diameter of decay lesions. Treatment of the various fruit species with formulated *T. harzianum* conidia in an invert emulsion significantly ( $P \leq 0.05$ ) reduced the mean lesion diameters of *R. stolonifer* on apple, pear, peach and strawberry, *B. cinerea* on grape, pear, strawberry, and kiwifruit, and *P. expansum* on grape, pear, and kiwifruit in comparison with the control treatment. Significant differences ( $P \leq 0.05$ ) were obtained in the mean percent reduction in lesion diameter caused by the same postharvest pathogens on the same fruit species due to the treatment with the formulated *T. harzianum* conidia relative to control treatment. The greatest mean percent reduction (86.7%) was obtained on apple fruit for the infection with *R. stolonifer*. Significant differences ( $P \leq 0.05$ ) were also obtained in the mean durations of the minimum protection period due to treatment with the formulated *T. harzianum* against the infection with the same postharvest pathogens on the same fruit species. The longest mean duration of the minimum protection period (up to 59 days) was obtained for unwounded apple fruit against the infection with *R. stolonifer*. Overall, the results indicate that the treatment with the invert emulsion formulation of *T. harzianum* protected fruit from infection by the primary postharvest pathogens of the fruit tested for up to 2 months and reduced the diameters of decay lesion up to 86% and is a promising treatment to prolong the postharvest shelf-life of fresh fruit.