

Title The combination of curing with either chitosan or *Bacillus subtilis* CPA-8 to control brown rot infections caused by *Monilinia fructicola*

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Abstract

Recently, it has been reported that brown rot in peaches and nectarines can be effectively controlled by exposing fruit to 50 °C for 2 h and 95–99% relative humidity (RH). This treatment was effective at reducing infections that had become established in the field. However, it did not provide protection for further *Monilinia fructicola* infections, indicating that fruit was susceptible to subsequent infections after the treatment process and before cool storage. Chitosan and *Bacillus subtilis* (strain CPA-8) were evaluated for their ability to prevent *M. fructicola* infections and for their ability to complement the heat treatment. Two chitosan concentrations (0.5% or 1%) were applied at three temperatures (20, 40 or 50 °C) for 1 min to wounded and unwounded fruit that were artificially inoculated with *M. fructicola*. One percent chitosan applied at 20 °C had a preventive effect against further *M. fructicola* infections on heat-treated fruit that had been previously inoculated: brown rot incidence was reduced to 10%, in comparison with the control (73%). However, chitosan applied to wounded fruit had a poor preventive effect. The antagonist, *B. subtilis* CPA-8, had a preventive effect in controlling *M. fructicola* infections: the incidence of brown rot was reduced to less than 15% for both varieties evaluated ('Baby Gold 9' and 'Andros' peaches), in comparison with the control fruit (higher than 98%). In contrast, when fruit were stored at 0 °C, this preventive effect was not detected. These findings indicate that heat-treated fruit can be protected from subsequent fruit infection after heat treatment by use of chitosan or *B. subtilis* CPA-8, thereby providing packinghouses with an effective biologically based, combined approach to the management of postharvest brown rot.