

## Abstract

The application of a cell suspension of the BIO126 strain of *Metschnikowia pulcherrima* proved to be highly effective in the control of blue and grey mould, two of the most severe postharvest diseases on apple fruit. The possibilities of integrating the application of the antagonist with chemicals such as acibenzolar-*S*-methyl (ASM), ethanol, or sodium bicarbonate and a heat treatment were investigated in this work. The fruit were stored at 23 °C for 5 days and at 4 °C for 20 days. The antagonist, applied at  $10^8$  cells ml<sup>-1</sup>, proved to be the key element for the control of both pathogens, being more efficient after cold storage, with a reduction of 56.6 and 97.2% in the lesion diameter of blue and grey moulds. Ethanol and acibenzolar-*S*-methyl permitted a partial reduction in grey mould severity. Heat treatment and sodium bicarbonate significantly improved the efficacy of the biocontrol agent against blue mould with storage at 23 °C. To study the possibility of a single application of the biocontrol agent ( $10^7$  cells ml<sup>-1</sup>) with reduced dosages of sodium bicarbonate or ethanol, the viability of the micro-organism with these chemicals was studied and a new set of experiments was established. Against both pathogens, the greater reduction in lesion diameter was obtained by treating simply with the biocontrol agent. Significant results on blue mould were provided by the application of 20% ethanol or 5% sodium bicarbonate before the biocontrol agent and by the application of BIO126 in 0.1% sodium bicarbonate. The application of the cell suspension of BIO126 *M. pulcherrima*, preceded or not by a pre-treatment with sodium bicarbonate or ethanol, could become a successful alternative to fungicide usage in postharvest disease control of pome fruit. The fungistatic effect of ethanol or sodium bicarbonate could be associated with the effect of the biocontrol agent, being persistent on the fruit for long periods.