

**Title** Could preharvest applications of *Pantoea agglomerans* CPA-2 control the main postharvest diseases on citrus fruit?

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### Abstract

Postharvest green mould, caused by *Penicillium digitatum* is one of the most economically important postharvest diseases of citrus in all production areas characterized by low summer rainfall. This disease often occurs in the field prior to harvest. Therefore, it could be advantageous to apply biocontrol agents before harvest, which would reduce initial infection and then remain active and control pathogens in storage and/or commercial conditions. However, biological control at field conditions is usually limited by fluctuating environment and by the narrow range of environmental conditions. The main goal of this research was to determinate the practical influence of different formulation strategies on the survival and efficacy of *Pantoea agglomerans* CPA-2 cells under field conditions, including lyophilized cells, osmotic adaptation of *P. agglomerans* by NaCl treatments and additives. Different additives, such as summer oils, alginate, glycerol and food additives were tested mixed with *P. agglomerans* in laboratory studies. The additive that provided the highest bacterial viability on oranges was the food film Fungicover (FC) at 50 g/l. In general, osmotic adapted and lyophilized *P. agglomerans* cells showed greater survival rates than non-osmotic adapted or fresh cells when these bacterial treatments were sprayed in field conditions. However, this superiority was only found when additive Fungicover was also added to suspension treatments. These results allowed us to conclude that it is possible to improve environmental stress tolerance and ecological competence of *P. agglomerans* cells by integrating certain formulation strategies, and it is feasible to control postharvest diseases by preharvest treatments.