

Title Influence of additives on adhesion of *Penicillium frequentans* conidia to peach fruit surfaces and relationship to the biocontrol of brown rot caused by *Monilinia laxa*

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Abstract

Additives, such as sucrose, d-sorbitol, glycerol, sodium alginate, carboxymethyl cellulose, silica gel, gelatine, non-fat skimmed milk and a commercial adhesive were added to conidia of *Penicillium frequentans* at two different points in the production process of the formulation of this fungus to improve conidial adhesion. Conidial adhesion was estimated as the number of *P. frequentans* conidia (no. conidia cm^{-2}) and colony-forming units of *P. frequentans* per unit area (cfu cm^{-2}) that adhered to glass slides or to peach surfaces. The *P. frequentans* conidial concentration had a significant effect on conidial adhesion, while the shelf life of conidia did not have any effect. The highest adhesion of *P. frequentans* conidia to glass slides was observed when conidial concentrations were greater than 10^6 conidia ml^{-1} . *P. frequentans* conidial adhesion was improved when 1.5% sodium alginate or 1.5% carboxymethyl cellulose were added to the conidial mass obtained after production and before drying by the fluid bed drying process. Conidial adhesion was also enhanced when 1.5% sodium alginate, 1.5% carboxymethyl, or 1.5% gelatine were added to conidia after fluid bed drying. *P. frequentans* formulations with 1.5% sodium alginate or 1.5% carboxymethyl cellulose were more effective in reducing brown rot caused by *Monilinia laxa* than dried *P. frequentans* conidia alone. Our results show that additives can improve adhesion of *P. frequentans* conidia to fruit surfaces, resulting in more effective control of brown rot in peaches.