

Potential use of bioagents in the control of postharvest rot in melon

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Abstract

Rot caused by *Fusarium pallidroseum* has had a severely negative impact on the export of melons from Brazil. Uncertainty regarding the health of the fruit due to the quiescent infection of the pathogen has led producers to use fungicides in the postharvest treatment of the fruit, thereby causing contamination and risking the health of consumers. Consequently, there is a demand for clean and safe natural technologies for the postharvest treatment of melons, including biological control. The present study aimed at evaluating bioagents for use in controlling *Fusarium* rot in 'Galia' melon. The following bioagents were evaluated: two isolates of *Bacillus subtilis*, *B. licheniformis* and a mixture of *B. subtilis* and *B. licheniformis*, as well as the yeasts *Sporidiobolus pararoseus*, *Pichia* spp., *Pichia membranifaciens*, *P. guilliermondii*, *Sporobolomyces roseus*, *Debaryomyces hansenii* and *Rhodotorula mucilagenosa*. Treatment with imazalil and water were used as controls. Two experiments were conducted in a completely randomised design with 10 replicates per treatment with four fruit per replicate; the disease incidence was evaluated in the first experiment, and the disease severity was evaluated in the second. Similarity analysis of the temporal evolution profiles of rot incidence caused by *F. pallidroseum* allowed the evaluated treatments to be clustered into four groups. In the first experiment, the yeasts *P. membranifaciens* and *D. hansenii* produced results similar to that of the fungicide imazalil. The second experiment highlighted the yeasts *P. guilliermondii* and *R. mucilagenosa*. Electron microscopy studies confirmed that once applied to the fruit, the yeasts colonised the skin and damaged the pathogen mycelium; the action of the yeasts affected the mycelium of *F. pallidroseum*, which had infected wounds on the fruit's surface. *Bacillus* spp. did not provide good disease control. These results demonstrated that yeasts have the potential to control postharvest rot caused by *F. pallidroseum* in 'Galia' melon.