

Control of Fusarium rot in Galia melon and preservation of fruit quality with UV-C radiation and hot water treatments

Daniel Terao, Katia L. Nechet, Rosa T. S. Frighetto, Valéria D. A. Anjos, Aline H. N. Maia and Bernardo A. Halfeld-Vieira

Tropical Plant Pathology 46: 350–359. 2021.

Abstract

Galia melon is an important commodity for Brazilian fresh fruit exports. Significant losses in harvested melon have been attributed to decay, especially caused by *Fusarium pallidoroseum*, the causal agent of Fusarium rot. Nowadays, the demand for an effective and safe approach to manage postharvest disease has increased. In the current study, two methods of control were studied: UV-C radiation at 2 kJ/m² and hot water treatment (HWT), which were tested in two different ways. Some fruits were immersed (hot water dipping, HWD) at 52 °C for 2 min, and others were hot water brushed (HWB) at 55, 60, 65, and 70 °C for 15 s. The influence of the treatments on the quality of melon was evaluated by physicochemical parameters, respiration and ethylene emission measurement, and enzymatic analysis. The *in vitro* tests showed that the dose of 1.0 kJ/m² of UV-C and the heat treatment at 55 °C for 15 s completely inhibited the spore germination of *F. pallidoroseum*. HWT by HWD at 52 °C for 2 min and HWB at 65 °C for 15 s, similarly to UVC treatment at 2 kJ/m², efficiently controlled Fusarium rot in Galia melon, not differing from the imazalil fungicide (100 g a.i./100L) treatment. The UV-C radiation reduced the activities of polyphenol oxidase and peroxidase at specific days of storage. The climacteric peak of respiration occurred on the 16th day for all treatments, and the intensity was significantly lower for UV-C treatment. Ethylene production was not remarkably affected. Consumer acceptance evaluation indicated that fruit treated by heat and UV-C presented better appearance on the 20th day of storage. Those treatments preserved the overall quality of the fruit, delaying the onset of rot symptoms, thus increasing shelf life.