

**Title** Treatment with UV-C light followed by NaHCO<sub>3</sub> application has synergic activity against citrus green mold

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**Citation** Abstracts Book, 6<sup>th</sup> International Postharvest symposium, 8-12 April 2009, Antalya, Turkey. 256 pages.

**Keyword** Citrus; UV-C light; NaHCO<sub>3</sub>

### Abstract

The enduring confrontation between fungal pathogens and hosts during storage and shelf-life, along with the restricted number of fungicides for postharvest use, have lead, in several citrus growing areas, to the selection of *Penicillium digitatum* (PD) and *Penicillium italicum* biotypes able to overcome the mode of action of several fungicides. In order to control R-biotypes and fulfil the restrictions, thorough researches have been undertaken on alternative approaches. Until now, single alternative treatments have not yet reached comparable results to synthetic fungicides. To overcome this difficulty treatments have been combined with the aim to find synergic interactions. Here we report encouraging results obtained by applying NaHCO<sub>3</sub> (SBC) to lemon fruit treated with UV-C light (254 nm). Lemon fruit (*Citrus limon* cv Vema) were harvested twice (April and August) and at each harvest fruit was graded, rinsed and when dry divided into 4 groups (each of 180 fruit) according to the following treatments: I) none; II) UV-C (3 kJm<sup>-2</sup>); III) SBC (w/v; 2%); IV) UV-C followed by SBC. The treatment with SBC was carried out by immersing the fruit in the solution at 60°C for 15 sec. When treatments were combined UV-C lightening was performed 5 min before immersion. Following treatment fruit was kept for 2 months at 5 °C and 90±5% RH followed by a 6 day simulated marketing period (SMP). The occurrence of natural decay was monitored after 1 month, at the end of storage and SMP. The same experiment was conducted with fruit artificially inoculated with PD (10<sup>5</sup> conidia mL<sup>-1</sup>) and kept at 25°C and 90 % RH for 5 days, then decay was monitored. In untreated fruit the degree of decay was greater in early compared to late harvested lemons. Nearly 65% of the early harvested un-treated fruit was lost by the end of the experiment while only 42% was in the late harvest ones. Decay was significantly reduced only by combining the two treatments. Indeed, the decay percentage for early and late harvested lemons subjected to the combined treatment was 8 and 5.2%, respectively. The results obtained from the inoculation experiment confirmed the trend observed in the storage trail.