

**Title** Short exposure to high CO<sub>2</sub> and O<sub>2</sub> at curing temperature to control postharvest diseases of citrus fruits

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### **Abstract**

Curing of citrus fruits at 30 to 37°C and 90 to 98% RH for 65 to 72 h is an effective alternative to fungicides to control postharvest green and blue molds, caused by *Penicillium digitatum* and *P. italicum*, respectively. However, commercial adoption is limited because treatment is long and it may harm fruit quality. In order to improve the feasibility of curing, short CO<sub>2</sub> or O<sub>2</sub> exposures at curing temperature were evaluated on ‘Nadorcott’, ‘Clemenules’ and ‘Ortanique’ mandarins, and ‘Valencia’ oranges. Fruit were artificially inoculated, exposed 24 h later to air (control), 15, 30, 50, or 95 kPa CO<sub>2</sub>, or 30 or 45 kPa O<sub>2</sub>, at 20 or 33°C for 8, 24, or 48 h, and incubated at 20°C for 4, 7, or 15 days. Exposure at 33°C with 15 kPa CO<sub>2</sub> for 24 h or 30 kPa O<sub>2</sub> for 48 h effectively controlled both green and blue molds after 7 days of incubation at 20°C, but control of both diseases was minimal after 15 days. To assess potential induction of disease resistance, fruit were treated as described above, then inoculated after 1, 2, or 5 days at 20°C and evaluated after 3 and 6 more days at 20°C. All of the treatments were ineffective in inducing fruit resistance. Short exposures of citrus fruit to high CO<sub>2</sub> or O<sub>2</sub> at curing temperatures may be part of a control program alternative to synthetic fungicides, especially for organic fruit markets.