Title Influence of temperature, inoculation interval, and dosage on biofumigation with *Muscodor albus* to control postharvest gray mold on grapes

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Abstract

Control of postharvest gray mold, caused by *Botrytis cinerea*, on Thompson Seedless grape by biofumigation with a rye grain formulation of *Muscodor albus*, a fungus that produces volatiles lethal to many microorganisms, was evaluated. The influences of temperature, biofumigant dosage, and interval between inoculation and treatment on disease incidence and severity on detached single berries were assessed. When biofumigation began within 24 h after inoculation, higher *M. albus* dosages ($\geq$50 g of the *M. albus* grain formulation per kilogram of grapes at 20°C or 100 g/kg at 5°C) stopped infections and control persisted after *M. albus* removal. Biofumigation was more effective at 20 than 5°C. Among inoculated clusters inside clamshell boxes incubated for 7 days at 15°C, gray mold incidence was reduced from 20.2% among untreated grape fruit to less than 1%, when $\geq$5 g of the formulation per kilogram of grapes was added. Among grape berries commercially packaged in ventilated polyethylene cluster bags incubated for 7 days at 15°C, gray mold incidence was 40.5% among untreated fruit and 11.1 or 6.7% when the formulation at 5 or 20 g/kg, respectively, had been added. In the same packaging, among grape berries incubated for 28 days at 0.5°C, gray mold incidence was 42.8% among untreated fruit and 4.8 or 4.0% when the formulation at 5 or 10 g/kg, respectively, had been added. Lower dosages ($\leq$20 g/kg) suppressed disease development while *M. albus* was present; however, after their removal, *B. cinerea* resumed growth and gray mold incidence increased. Placement of *M. albus* inside grape packages significantly controlled gray mold and may be a feasible approach to manage postharvest decay of table grape.