Title Deployment of low-level ozone-enrichment for the preservation of chilled fresh produce

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Abstract

Tomatoes, strawberries, table grapes and plums were inoculated with *Botrytis cinerea* (grey mould), transferred to chilled storage (13 °C) and exposed to 'clean air' or low-level ozone-enrichment (0.1 μmol mol^{-1}). Ozone-enrichment resulted in a substantial decline in spore production as well as visible lesion development in all treated fruit. Exposure-response studies performed specifically on tomato fruit (exposed to concentrations ranging between 0.005 and 5.0 μmol mol^{-1} ozone) revealed lesion development and spore production/viability to be markedly reduced in produce exposed to ozone prior to, or following, infection with *B. cinerea*; higher concentrations/duration of exposure yielding greater reductions in lesion development and spore production/viability. Impacts on *Botrytis* colonies grown on Potato Dextrose Agar (PDA) for 5–6 days at 13 °C and 95% relative humidity (RH) revealed less effects than studies on fruit inoculated with the pathogen *in vivo*. Taken as a whole, the results imply that ozone-induced suppression of pathogen development is due, to some extent, to impacts on fruit–pathogen interactions. This work suggests that ozone may constitute a desirable and effective residue-free alternative to traditional postharvest fungicide practices. Data presented illustrate that optimal ozone treatment regimes are likely to be commodity-specific and require detailed investigation before such practices can be contemplated commercially.