

Title The efficacy of ultrasonic fumigation for disinfestation of storage facilities against postharvest pathogens

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Abstract

Inoculum of postharvest pathogens can accumulate inside storage rooms and contaminate new batches of fruit and vegetables, but this chain can be broken by disinfecting storage facilities between storage periods. Quaternary ammonium (QA) has been known for over 50 years as an efficient disinfectant against microorganisms, with wide applications in the food industry. The aim of this study was to determine the efficacy of didecyldimethylammonium chloride (Sporekill, designated here as QA^{sk}), against development of *Botrytis cinerea* after direct exposure or by ultrasonic fogging. Following direct exposure to a concentration of QA^{sk} below 5 mg L⁻¹, a population of 10⁴ conidia of *B. cinerea* was inactivated after 2 min; ultrasonic fogging with QA^{sk} at 500 mg L⁻¹ took 30 min to achieve consistent inactivation. Fumigation at 20 °C was considerably more effective than fumigation at 5 °C, and similar results were obtained for three other postharvest pathogens, *Penicillium expansum*, *Colletotrichum gloeosporioides* and *Alternaria alternata*. These results show that conidia of *B. cinerea* are highly sensitive to direct exposure to QA^{sk}, but that effective sanitation of a storage facility by ultrasonic fumigation requires a QA^{sk} concentration two orders of magnitude greater.