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Ahonsi, M.O.; Banko, T.J.; Doane, S.R.; Demuren, A.O.; Copes, W.E.; and Hong, C.X. 2008. *Phytophthora nicotianae* zoospores evade pressure and agitation stress but are completely destroyed by CO(2) injection. *Phytopathology* 98:S10.

Phytophthora nicotianae is a known pathogen of numerous herbaceous and some woody ornamental plants, and is commonly isolated from recycled irrigation ponds. Zoospores are the most important propagules of *Phytophthora* spp. Using simulated recycled irrigation water we investigated the survival of *P. nicotianae* zoospores as affected by hydrostatic pressure, agitation, and aeration with CO(2) or air. Exposing zoospores to hydrostatic pressure of 840 kPa for 8 min or agitation of mixing intensity $G = 6483$ 1/s for 4 min did not kill any zoospores. However, bubbling CO(2) into zoospore-infested water at 110.4 ml (0.2 g)/min for 5 min consistently killed up to 81% of the zoospores. Further extending CO(2) injection up to 30 min did not increase percent zoospores killed although fewer were killed with a shortened injection time. When we exposed zoospores to CO(2) pressure of 630 kPa (16.3 g CO(2)) or 70 kPa (3.85 g CO(2)) for 30 seconds or longer, percent zoospore kill did not differ from one another and did not differ from bubbling CO(2) at 110.4 ml/min for 5 min. In contrast, when the same treatments were done using pressurized air in place of CO(2), all zoospores survived. In further experiments, when we minimized cyst formation during zoospore-infested water preparation by avoiding vigorous shaking, CO(2) injection consistently resulted in over 98% zoospore kill. We concluded that the percent zoospores not killed by CO(2) injection in previous experiments were zoospores that had encysted before exposure to CO(2). Similarly, hydrostatic pressure and agitation treatments induced cyst formation and consequently allowed 100% survival. Results indicate that CO(2) treatment may be a promising alternative technology for disinfecting recycled irrigation water contaminated with *P. nicotianae*.