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MIXED VS. MONOCULTURE HYDROPONIC PRODUCTION OF SALAD CROPS AT THREE CO₂ CONCENTRATIONS

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Development of cropping systems for use on the International Space Station, long duration transit missions, and lunar or Mars habitats has been a part of NASA's Advanced Life Support (ALS) research efforts for many years. Growth of multiple crops on a common solution will increase efficiency, but may result in allelopathic responses being induced. Three candidate ALS salad crops, radish (*Raphanus sativus* L. cv. Cherry Bomb II), lettuce (*Lactuca sativa* L. cv. Flandria) and bunching onion (*Allium fistulosum* L. cv. Kinka) were grown hydroponically as either monoculture (control) or mixed-crop within a walk-in growth chamber at three CO₂ concentrations (400, 1200 and 4000 μmol mol⁻¹) to determine if allelopathic responses were occurring. The chambers were maintained at 22°C, 50% RH, and 300 μmol m⁻² s⁻¹ PPF with a 16-h light/8-h dark photoperiod using cool-white fluorescent lamps (17.2 mol m⁻² d⁻¹ PAR). Results showed no negative effects of mixed-cropping under these CO₂ concentrations.