

### **Abstract**

Controlled atmosphere (CA) storage is very effective in delaying postharvest senescence of broccoli. We have been using CA treatments to determine how altered carbon dioxide and oxygen levels function to delay senescence of harvested vegetables. Broccoli heads held in CA (10% CO<sub>2</sub>, 5% O<sub>2</sub>) did not yellow and had reduced weight loss compared to those held in air (<0.01% CO<sub>2</sub>, 20% O<sub>2</sub>). In addition, tissues treated with CA had low protease activity, and retained at-harvest protein and soluble sugar levels compared to heads held in air. Short-term CA storage (12, 24 h) delayed the onset of yellowing by the period the tissue had been held in CA (i.e. 12, 24 h) indicating that there is no "carry over" effect; CA is only effective at delaying broccoli senescence while tissues are held in CA. We compared the effectiveness of individual components of CA (i.e. lowered O<sub>2</sub> VS elevated CO<sub>2</sub>). The onset of senescence was delayed by both treatments, but the combined effect (CA: 10% CO<sub>2</sub>, 5% O<sub>2</sub>) was superior and in some instances better than the sum of the individual components.