

Abstract

The effect of different O₂ levels from 0 to 100 kPa in combination with 0, 10 and 20 kPa CO₂ on the respiration metabolism of greenhouse grown fresh-cut butter lettuce was studied. Controlled atmospheres of 20 or 75 kPa O₂ with 0 or 10 kPa CO₂ showed a constant respiration rate during the first 2–4 days at different temperatures (1, 5 and 9 °C). Therefore, constant respiration rates during a short period of 2–4 days could be considered as valid for a large part of the commercial life of, for instance, a modified atmosphere package development. The fresh-cut lettuce exposed to low O₂ levels (2–10 kPa) combined with moderate to high CO₂ levels (10 and 20 kPa) had a higher respiration rate than when 20–100 kPa O₂ were used. Moderate CO₂ levels (10 kPa) reduced the respiration rates of fresh-cut lettuce 20–40% at 9 °C. This effect was less noticed at lower temperatures. Gas composition with high CO₂ levels (20 kPa) probably caused a metabolic disorder increasing the respiration rate of fresh-cut butter lettuce. It was concluded that 80 kPa O₂ must be used in modified atmosphere packaging (MAP) to avoid fermentation of fresh-cut butter lettuce in combination with 10–20 kPa CO₂ for reducing their respiration rate.