

Title How do alternative storage methods affect the storage potential of carrots?
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Abstract

A high storage potential is necessary to ensure a year-round supply of carrots (*Daucus carota* L.) in Northern Europe. Carrots can be stored for 6 to 8 months at 0-1°C and >95% RH without loss of quality provided that pathogens do not develop. Recently, a complex mix of fungal pathogens causing dark brown to black spots on the epidermis of the carrot has resulted in severe losses of carrots late in the season. This renewed the interest in developing efficient strategies for extending the storage life of carrots. 'Nipomo' carrots from the 2006- and the 2007-season were stored in air-tight containers holding a RH >98% for up to 210 d at 0.5-1°C. The treatments were: atmospheric air, atmospheric air enriched with volatiles from thyme essential oil, air enriched with ozone and controlled atmosphere (CA) at 18% O₂ + 3% CO₂. Respiration rate was low (<2 ml CO₂ kg⁻¹ h⁻¹) throughout storage with no increase towards the end of storage. Carrots sprouted during storage. Leaves emerged first, then secondary roots. Secondary roots grew in number and size between the 3rd and 4th month of storage. At the same time the concentration of volatiles reached its minimum. Black spots incidence increased during this period indicating that carrot storability may be influenced by metabolic processes that alter the concentrations of secondary plant metabolites in the carrot periderm. The highest incidence of black spots was recorded in the CA- and ozone-treated carrots with air-treated carrots being intermediate. The lowest incidence was found in the thyme-treated carrots.