

Abstract:

Brown Heart (BH) in 'Conference' pears (*Pyrus communis* L.) can appear in CA storage. BH could be due to lower energy production than maintenance energy needs. Gas exchange rates of individual fruit were measured in different pO_2 and pCO_2 at 0°C at harvest and during the first period of storage, on 'Conference' pears of different maturity stored in 2% O_2 and 0.7 or 5% CO_2 . Gas exchange rate data were analysed by non-linear regression using Michaelis-Menten type models. O_2 uptake followed a model with no inhibition by CO_2 . At harvest, maximum O_2 uptake decreased with later harvest, and during storage it decreased in early-harvested pears, but not in late-harvested ones. Resistance to gas diffusion was higher for O_2 than for CO_2 , contrary to what is predicted by Graham's Law. Late-harvested fruit showed higher resistance to gas diffusion, increased KmO_2 with storage time and reduced aerobic respiration at pO_2 close to that of storage atmosphere. Late-harvested fruit showed higher BH than normal-harvested fruit, especially with high pCO_2 . Gas exchange rates could be related to BH in late-harvested fruit. No effect of CO_2 was found on O_2 exchange rates. It appears that processes other than gas exchange rate are involved in the relationship between CO_2 and BH.