

Abstract

Assessment of existing gas exchange models for bulk storage of pome fruit was carried out. Michaelis-Menten type gas exchange models were found appropriate as opposed to the empirical ones due to their generic behavior. Of the different variants of the Michaelis-Menten type model structure, the uncompetitive and mixed type of inhibitions were selected and tested using experimental data obtained from a bulk storage experiment. No distinction between the uncompetitive and mixed type models could be made at the levels of CO₂ considered. However, based on the number of degrees of freedom and literature recommendations, the non-competitive type inhibition was found to be preferable. Significant influence of the age of fruit on their gas exchange rate was observed. It is recommended that the kinetic parameters of the model be expressed as a function of the physiological age of the fruit to include the influence of age when the models are to be used to simulate gas exchange of bulk stored fruit for longer storage period.