

Abstract:

The design of MAPs for fruits requires careful tuning to account for the interaction between the cultivar, the surrounding atmosphere and external conditions; which is usually accomplished by “trial and error”. Knowledge of the permeability of the available films in the relevant range of temperatures would allow the prediction of the evolution of the MAP atmosphere (as long as the respiratory characteristics of the cultivar under consideration are known), and hence the design of the optimal MAP. A device to measure the permeability of flexible films to O₂ and CO₂ has been developed. The device operates on the principle of the standard test method for gas transmission rate through plastic films ASTM D3985-95. The measurements can be made at different temperatures. The permeability of six films (two low-density polyethylenes and four polypropylenes) has been determined at temperatures of 0, 2, 5 and 25 °C. The optimal film was selected for MAP storage of Burlat and Sunburst sweet cherries taking into account their tolerance to different O₂ and CO₂ levels. Monitoring of the evolution of the atmosphere composition inside the packages has verified the predictions of our model and thus validated our method for choosing the optimal film and MAP conditions.