**Title** Application of PACK-in-MAP software for MAP design

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## Abstract

PACK-in-MAP is a web-based (www.packinmap.com) software tool that helps in designing modified atmosphere packages for fresh and fresh-cut fruits and vegetables. The user-friendly online software determines the needs for packaging of fruits and vegetables in order to maintain the high quality and extend the shelf-life. The software contains a database on information on product respiration rate, optimum temperature, and optimum range of $O_2$ and $CO_2$ concentrations as well as permeability of different packaging materials, including micro-perforated films. The published information on MAP has been compiled and PACK-in-MAP software has been developed to establish which commercially available polymeric films would be most suitable for a particular produce. A case study will be presented to illustrate the use of the software to design a MAP for 1 kg of whole mango var. Nam dok mai packed in a box type package with total volume 1.55 x $10^{-3}$ $m^3$. Ethyl cellulose was found to be the best film with an area of 0.0221 $m^2$ yielding 6.5% O2 and 7.35% CO2 at steady state level. This gas composition was found to be within the optimal range for whole mango. The software was further used to simulate the package $O_2$ and $CO_2$ during storage, to know other alternative films and also to evaluate the impact of product and package variability on MAP.