VII Postharvest Unlimited Congress

Abstract book

DAY 1 - 15 May	8.30 - 8.45	Opening		
	8.45- 9.15	Keynote Toine Timmermans		
	9.15 - 10.00	Keynote Ernst Woltering		
	10.00 - 10.30	Coffee & poster viewing		
	10.30 - 12.00	Plenary session: Thijs Defraeye, Rick van de Zedde, Bart Nicolai		
	12.00-13.30	Lunch & poster session 1		
		Podium	**Momentum 2-3**	**Momentum 1**
	13.30 - 15.00	PHU session 1a Invited: Pedreschi	PHU session 1b	PHO session 1 Invited: Çelikel
		Physiology 1	Postharvest Pathogens 1	
	15.00 - 15.45	Coffee & poster viewing		
	15.45 - 17.15	PHU session 2a Invited: Mishra	PHU session 2b	PHO session 2 Invited: Fanourakis
		Quality Measurements 1	Storage and technology 1	
DAY 2 - 16 May	9.00 - 10.15	PHU session 3a Invited Bovy	PHU session 3b	PHO session 3 Invited: Arens
		Preharvest conditions 1	Sensory & nutrition	
	10.15 - 11.00	Coffee & poster viewing		
	11.00 - 12.15	PHU session 4a Invited: Lukasse	PHU session 4b	PHO session 4
		Logistics and modelling	Pre-harvest treatments 1	
	12.15 - 14.00	Lunch & poster session 2 & business meeting Ornamentals (momentum 1)		
	14.00 - 15.30	PHU session 5a	PHU session 5b	PHO session 5 Invited: Verdonk
		Quality Measurements 2	Physiology 2	
	15.30 - 17.00	Excursion NPEC/Phenomea/Unifarm	Excursion NPEC/Phenomea/Unifarm	Excursion NPEC/Phenomea/Unifarm
	19.00 - 22.30	Conference dinner, WICC		
DAY 3 - 17 May	9.00 - 10.30	PHU session 6a Invited: Farneti	PHU session 6b	PHU session 6c
		Physiology 3	Preharvest conditions 2	Postharvest Pathogens 2
	10.30 - 11.00	Coffee & poster viewing		
	11.00 - 12.30	PHU session 7a	PHU session 7b	PHU session 7c
		Quality Measurements 3	Postharvest treatments 1	Chilling and disorders 1
	12.30 - 14.00	Lunch & poster session 3 & business meeting Unlimited (momentum 2-3)		
	14.00 - 15.00	PHU session 8a	PHU session 8b	PHU session 8c
		Chilling and disorders 2	Packaging and coating 1	Storage and technology 2
	15.00 - 15.30	Coffee & poster viewing		
	15.30 - 16.30	PHU session 9a	PHU session 9b	PHU session 9c
		Packaging and coating 2	Postharvest treatments 2	Storage and technology 3
	16.30 - 17.00	Closing ceremony		
	17.00 - 18.00	Farewell drinks, Restaurant Omnia		

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ISHS International Conference
14-18 May 2023 - Wageningen, NL

XII Postharvest Ornamentals
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Session: PHU8b-2

Evaluating the role of the perforation cross-section profile on the gas exchange through microperforated packages

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Abstract

The main objective of this work was to evaluate the impact of the perforation cross-section geometry on the gas transport of microperforated modified atmosphere packages. A 3D numerical model, that considers a space-time and pressure dependence of the gas composition, was adapted to simulate the gas concentration profiles around the microperforation, considering both diffusive and convective flows. The model was implemented in COMSOL Multiphysics® for eight case studies consisting in microperforations with different cross-section geometries (circular, squared, triangular, trapezoidal, and the actual geometry of a microperforation obtained from SEM images), maintaining the same minimal area (7420.6 µm 2). A custom-built experimental system composed by two chambers was designed to measure the gas transport through microperforations. The upper chamber was filled with a 20.95% CO 2 -0.05% O 2 -79% N 2 gas mixture, while the lower chamber was initially filled with air. The perforation was attached between the two chambers, and a CO 2 sensor was placed in the lower chamber. The results for the actual cross-section geometry were successfully verified with experimental data. In this case, the final concentration of CO 2 was 12% and the root mean squared error of the simulation values was 0.01%. The model predictions revealed the importance of properly characterizing the cross-section profile, since the CO 2 concentration at the end of the simulation (216 h) varied between 10% to 13%, depending on the geometry. The influence of slight variations in the atmospheric pressure on gas exchange through microperforations was also analysed. For this purpose, two cases were considered: constant and variable atmospheric pressure according to the data recorded experimentally. From the results obtained with these simulations it can be concluded that small fluctuations in the atmospheric pressure affect the gas exchange through the microperforation since the concentration of CO 2 at constant pressure was 3% less than at variable pressure.