

SUPPRESSION OF AVOCADO RIPENING WITH NEW PALLADIUM-PROMOTED ETHYLENE SCAVENGER

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The control of ethylene in stored environments plays a key role in prolonging the life of many fresh produce types. However, there has been a paucity of research in recent years on developing novel and more effective ethylene scavenging materials. In this study a palladium (Pd)-promoted powdered material that has significant ethylene adsorption capacity ($4162 \mu\text{l g}^{-1}$ material) at 20°C and approx. 100% RH was identified and was shown to be far superior to KMnO_4 when used in low amounts and in conditions of high relative humidity (RH).

Initial screening was carried out in a plug flow reactor with $200 \mu\text{l l}^{-1}$ ethylene, 10% (v/v) O_2 balanced with He at approx. 100% RH. Further work demonstrated that the Pd-promoted material at 0.03 g l^{-1} effectively scavenged both exogenously administered ($100 \mu\text{l l}^{-1}$) and/or endogenously produced ethylene by avocado, respectively, to sub- $\mu\text{l l}^{-1}$ concentrations within a 24h period. Optimum ethylene adsorption capacity was calculated as approx. $10000 \mu\text{l g}^{-1}$. Accordingly, corresponding inhibition of ethylene-induced ripening was observed. When removed, Pd-material did not disrupt subsequent ripening. The results from this study demonstrate that Pd-promoted material has commercial potential.