

**Title** Towards a biochemical marker for superficial scald susceptibility

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### Abstract

Cold storage of apples under regular or modified atmospheres depending on the cultivar, on fruits developing superficial scald, a chilling-type disorder of paramount importance for apple growers worldwide. Oxidation of  $\alpha$ -farnesene into conjugated trienes (CTs) in the peel tissue is thought to play a key role in the development of scald. To date, no alternatives are available to predict the incidence of this disorder in fruits stored under different conditions albeit some researchers have proposed the ratio between CTs and certain lipophilic antioxidants to be correlated with scald incidence in a range of cultivars. The present study, conducted with highly susceptible 'Granny Smith' apples, studied the relationship between several biochemical markers (*viz.*  $\alpha$ -farnesene, antioxidant capacity, hydrogen peroxides, CTs and specific antioxidants) and scald incidence in fruits kept under different storage regimes (*viz.* CA, DCA, ULO and CA + I-MCP). The results showed that neither changes in fruit antioxidant potential nor the generation of hydrogen peroxide within the fruit tissues were associated with scald incidence. The already established ratio between specific antioxidants and/or CTs (CT258/CT28I) failed to predict scald susceptibility. In contrast, a novel and accurate index ( $r^2 = 0.75$ ), based on  $\alpha$ -farnesene accumulation dynamics during early stages of storage (50 days) is proposed aiming to predict scald susceptibility in different apple cultivars.