Title Potato (*Solanum tuberosum* L.) tuber physiological age index is a valid reference frame in postharvest ageing studies

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Abstract

Essential yield components of potato crops are influenced by the physiological age of the tubers at planting. Previous studies have attempted to develop biophysical, physiological or biochemical markers of potato tuber ageing. This research note focuses on characterising a physiological age index (PAI) based on sprouting parameters and originally developed by Caldiz et al. [Caldiz, D.O., Fernandez, L.V., Struik, P.C., 2001. Physiological age index: a new, simple and reliable index to assess the physiological age of seed potato tubers based on the haulm killing date and length of the incubation period. Field Crop. Res. 69, 69–79]. The PAI progression of two cultivars (‘Bintje’ and ‘Désirée’) was measured and modelled over 2 harvest years. The preliminary results were consistent with other ageing markers such as the incubation period (IP) and desprouting sensitivity. Under our experimental conditions, the PAI allowed us to describe cultivar-specific and harvest year-specific age variations measured from the time the haulm (foliage) was killed and the mother plant's influence on the tubers was no longer present. By contrast, the IP data displayed a higher inherent variability that impaired their discrimination ability. Critical PAI values corresponding to the main postharvest developmental steps (e.g., dormancy, apical dominance, multiple sprouting) were then identified on the basis of emergence pattern data, allowing us to propose this index as a useful reference frame for future ageing studies.