

Interaction of oxygen and moisture content on ‘Barton’ and ‘Jackson’ pecan storage

Flavio Roberto Thewes, Vanderlei Both, Fabio Rodrigo Thewes, Auri Brackmann, Erani Eliseu Schultz, Magno Roberto Pasquetti Berghetti, Francis Junior Soldateli, Lucas Mallmann Wendt, Airton Führ, Roger Wagner and Stephanie Reis Ribeiro

Postharvest Biology and Technology, Volume 179, September 2021, 111584

Abstract

The effects of the nut moisture content (MC) and storage conditions on the physicochemical quality and volatile compound (VC) profile after storage of pecan nuts are still poorly understood. Therefore, the present study aimed to evaluate the effects of MC (6 and 4 %) and the interaction with atmospheric conditions (20.9 kPa) and low O₂ partial pressure (2 kPa O₂) on ‘Barton’ and ‘Jackson’ pecan storage. Color parameters, internal browning (IB) incidence and severity, respiration rate, acidity, peroxide value (PV), and VC profile after 8 and 12 months of storage at 20 °C were evaluated. ‘Barton’ and ‘Jackson’ pecans stored with 6 % MC + 2 kPa O₂ presented the highest hue and luminosity (L) values, i.e. lighter color, after 8 and 12 months of storage. However, ‘Barton’ and ‘Jackson’ pecans stored with 6 % MC + 20.9 kPa O₂ had the highest IB incidence and severity and respiration rate. After 8 months, pecans stored with 4 % MC + 20.9 kPa O₂ had lower acidity and PV in both cultivars, compared with the pecans stored under 6 % MC + 20.9 kPa O₂. The lower O₂ in ‘Barton’ pecans stored with 6 % MC decreased PV, which was also the case for ‘Jackson’ nuts stored at 4 % MC. Regardless of the MC, pecans stored under 2 kPa O₂ had the lowest hexanal and hexanol contents in both cultivars. Our findings suggest that it is necessary to choose between reducing MC or kPa O₂ when aiming to maintain the quality of ‘Barton’ and ‘Jackson’ pecans stored under ambient temperature conditions (20 °C).