Comparing permeabilities of pedicel and fruit surface of sweet cherry to water Vapor

Thomas Athoo, Moritz Knoche

Leibniz Universität Hannover, Institute for Horticultural Production, Section Fruit Science

thomas.athoo@obst.uni-hannover.de

Pedicel appearance is an indicator of fruit freshness in sweet cherries (*Prunus avium* L.) and fruit with shriveled brown pedicels have reduced market value. Shriveled brown pedicels are thought to result from postharvest water loss (Linke et al., 2010). The objectives of the present study were to 1) quantify the permeability of fruit and pedicel surface in transpiration, 2) determine the role of the fruit in pedicel transpiration and 3) identify the effect of selected factors thereon. Fruit with and without pedicels were incubated (temperatures 2, 12, 22 and 35oC; relative humidities 0, 28, 75, 92 and 100%; stages of development 31 to 76 days after full bloom) (DAFB) and the mass loss determined gravimetrically. Pedicel transpiration was calculated by subtracting transpiration of fruit without pedicel from that of fruit with pedicel. Cumulative transpiration increased with time in fruit with and without pedicels both under short- (0-1.5h) and long- (0-72h) term conditions. Water vapor permeability of pedicels was significantly higher (5.3(± 0.5)*10-4 m s-1) than for the fruit (1.4(± 0.0)*10-4 m s-1). However, rates of transpiration declined over time as the water content of the pedicel became limiting. Rates of transpiration were negatively correlated with relative humidity, but positively with temperature. There was no effect of humidity and/or temperature on permeability. There was no consistent change in pedicel transpiration in the course of development. It is concluded that 1) in sweet cherries permeability of the pedicel exceeds that of the fruit without pedicel, 2) the fruit serves as a water reservoir for the transpiring pedicel and 3) pedicel transpiration may be minimized by decreasing temperature and increasing relative humidity during postharvest handling and storage.