

Title Use of evaporative cooling to improve 'Rosemarie' and 'Forelle' pear fruit blush colour and quality
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Abstract

In *Pyrus communis* 'Rosemarie', a potentially lucrative blushed pear cultivar, poor fruit colour has been ascribed to pre-harvest red colour loss during periods of high temperature. High temperatures combined with high irradiances also lead to sunburn on pome fruit. The use of pulsed overhead evaporative cooling (EC) to improve red colour and reduce sunburn in two blushed pear cultivars was evaluated over four seasons (2000/01 to 2003/04) in Stellenbosch, South Africa. 'Rosemarie' fruit blush was usually but not always improved under EC, with a late application (starting two weeks before harvest) yielding the best improvement. Peel anthocyanin concentrations were increased under EC. Incidence of sunburn was reduced during some years, but increased in EC-treated fruit during 2003/04 due to system failure on a hot day. EC initiated early in fruit development initially led to larger fruit with a lower TSS concentration and firmness, but this effect was gradually eliminated following reductions in EC water use. EC had no effect on 'Forelle' pear fruit colour or mass, but reduced firmness and TSS when started early in the season. Sunburn was only recorded in EC-treated fruit during 2002/03 due to system failure on a warm day. Though EC could be used to improve 'Rosemarie' fruit colour in warm production areas, its effect was relatively small compared to colour change in response to fluctuating temperature. The increased risk of sunburn during system 'downtime' highlights the requirement for a highly reliable system.