Title Partial rootzone drying maintains fruit quality of 'Golden Delicious' apples at harvest and postharvest

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Citation Scientia Horticulturae, Volume 127, Issue 3, 10 January 2011, Pages 455-459

Keywords Water-savings; Fruit size; Fruitweight loss

Abstract

Partial rootzone drying (PRD) has been evaluated at harvest, but its effects on apple fruit postharvest life is little known for apples grown in semi-arid regions. The objective of this study was to test the hypothesis that water savings via PRD may affect fruit quality at harvest and postharvest-life of 'Golden Delicious' apples grown in a semi-arid region. The experiment was conducted from 2005 to 2007. The irrigationtreatments were commercial irrigation as control (CI) and PRD. After 3 years of evaluation, fruit quality at harvest, measured as fruitweight, flesh firmness, and total soluble solids concentration, was similar between CI fruit and PRD fruit. Dry matter concentration (DMC) was higher in PRD fruit than in CI fruit in 2005. The fruit quality after 18 days storage at room temperature (13–18 °C and 51–56% relative humidity) was similar between CI fruit and PRD fruit. The DMC was the highest in PRD fruit in the 2005 and 2007 growing seasons, and tended to be higher in PRD fruit than in CI fruit in 2006. Total soluble solids concentration was ≈8.7% higher in PRD fruit than in CI fruit in 2007. Fruitweight loss was similar between treatments. This study suggests that water deficit via PRD did not damage fruit quality at harvest or after storage at room temperature. Additionally, PRD irrigation saved about 3240 m^3 of water per hectare. Therefore, PRD can be recommended for commercial use in semi-arid regions and to those growers interested in either long-term storage or distant markets.