Title Effects of post-harvest regulated deficit irrigation on carbohydrate and nitrogen partitioning, yield quality and vegetative growth of peach trees

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Abstract

The aim of the present work was to evaluate the effects of regulated deficit irrigation (RDI) applied in the post-harvest stage of peach trees. The 3-year trial was carried out in Italy (N 40°20′, E 16°48′) on mature peach plants (cv "Springcrest") trained to transverse Y. From bud break to harvest, irrigation was carried out by applying 100% ET_c, while from harvest to early autumn, plants were separated into three groups and subjected to different irrigation treatments (100, 57 and 34% ET_c). The decrease in soil water content caused a reduction in the values of tissue water potential and gas exchange both in 57% ET_c and 34% ET_c treatments. RDI determined the reduction in the growth of waterspouts and lateral shoots but did not influence the growth of fruiting shoots. During the trial, no significant reductions in crop yield and quality were observed in the 57% ET_c treatment, whereas about 1,100, 1,800 and 2,500 $m^3\ ha^{-1}$ of water were saved in the first, the second and the third year, respectively. In the second year of the trial, the use of RDI in the post-harvest stage determined carbohydrate and nitrogen accumulation in roots, branches, shoots and floral buds. The results demonstrate that, under scarce water supply conditions, a clear benefit can be obtained through the use of RDI during the post-harvest stage. This confirms the possibility to reduce the irrigation water by applying RDI during phenological stages less sensitive to water deficit without negatively affecting peach growth and yield.