

Effects of Regulated Deficit Irrigation on Pear Trees cv. Conference under Temperate Zone Climate

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Abstract

To prevent drought stress, pear trees (*Pyrus Communis*, cv. 'Conference') in Belgium and the Netherlands, under temperate climate conditions are equipped with a drip irrigation system. To determine the optimal Soil Water Tension (SWT) threshold a field experiment was accomplished in a commercial orchard during two successive years (2007-2008). The objective was to test the impact of Regulated Deficit Irrigation (RDI) during the shoot growth period. The orchard was situated on a silt loam soil, and contained 11 year old pear trees cv.'Conference' on Quince Adams rootstock. The trees were trained in a free spindle system with a planting distance of 3.50 m x 1.25 m. One sided root pruning was performed one month before full bloom. Each year two different irrigation regimes were accomplished. In the control treatment (T1) SWT was maintained above -45 kPa during the whole growing cycle. In the second treatment (T2) SWT reached -60 kPa up to -80 kPa during shoot growth. Each treatment consisted of minimally three randomised blocks of 4 trees. Irrigation was scheduled with the aid of a soil water balance model calibrated by granular matrix sensors (Watermark) and gravimetric soil moisture determination. Based on the data of a nearby weather station, Reference Evapotranspiration (ET₀) was calculated with the Penman-Monteith method. The tree water status was examined by Stem Water Potential (SWP) readings and sap flow measurements (Thermal Dissipation Probes). At harvest yield, fruit size and fruit quality of T2 did not differ from those of T1. Tree water status was not influenced by the depressed SWT. These findings illustrate the possibilities of RDI, on a silt loam soil under temperate climate conditions.