

Response of avocado trees to different irrigation regimes

A. Effect of water amount on yield and tree development

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Summary

Irrigation experiments have been conducted for 10 years at the experimental station of Gilat (semi arid area). The experimental program includes comparison of two irrigation methods (drip and micro-jet), examination of the effect of three levels of water amount (low, medium and high) in each irrigation method on yield and tree development, and the response of five combinations of scion/rootstock to each of the above treatments. The experiment includes 5 replicates in randomized blocks. Irrigation quantities increased from year to year in accordance with the development of the trees, keeping constant the proportions between the water quantities (1:1, 5:2).

From 1985 onwards, water amount per irrigation was 18 mm for the low, 26 mm for the medium and 36 mm for the high treatment. The annual water amount was dependent on the irrigation frequency, varying during the growing season and determined by the water tension in the soil read by tensiometers. The tensiometers were installed in the medium treatments at depth of 30 cm and at 25 cm distance from dripper or micro-jet. Irrigation started when the majority of the tensiometers read 25-30 centibars. Tree yield, degree of chlorosis and leaf tip-burn, as well as mineral composition of leaf samples were recorded.

Results show that irrigation with higher amount of water produces large trees in the early years after planting. When reaching maturity, bearing higher yield, chlorosis and leaf tip-burn was less than with the other treatment. As expected, leaf chlorine content (the main cause for leaf tip-burn) was negatively related to irrigation quantity. Doubling the water amount cut to half the leaf chlorine content, from 0.44% to 0.22%. Under the conditions of Gilat (soil and climate), drip irrigation was superior to micro-jet, with respect to fertility as well as to chlorosis and leaf tip-burn. All of the tested combinations scion/rootstock reacted similarly to the irrigation treatments.