Effect of Irrigation Water Salinity on Transpiration and on Leaching equirements: A Case Study for Bell Peppers

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Abstract

Maximization of crop yields when the salinity of irrigation water is high depends on providing plant transpiration needs and evaporative losses, as well as on maintaining minimum soil solution salinity through leaching. The effect of the amount of applied irrigation water was studied regarding transpiration, yields, and leaching fractions as a function of irrigation water salinity. Bell pepper (*Capsicum annum* L. vars. Celica and 7187) in protected growing environments in the Arava Valley of Israel was used as a case-study crop to analyze water quantity-salinity interactions in a series of lysimeter, field and model simulation experiments. Leaching fraction was found to be highly influenced by plant feedback, as transpiration depended on root zone salinity. Increased application of saline irrigation water led to increased transpiration and yields. The higher the salinity level, the greater the relative benefit from increased leaching. The extent of leaching needed to maximize yields when irrigating with saline water may make such practice highly unsustainable.