

IRRIGATION OF ORNAMENTAL SHRUBS WITH TREATED MUNICIPAL WASTEWATER

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EXTENDED ABSTRACT

The effort to balance water use among domestic, industrial and agricultural users has led to the need to find and use alternative irrigation water resources. Wastewater reuse is one possible solution that is being implemented, especially in agricultural and landscape irrigation.

The aim of the present work was to investigate the effects of irrigation with treated municipal wastewater through subsurface drip method, on growth characteristics of three ornamental coniferous plants, namely *Juniperus of chinensis* cv. *Stricta*, *Thuja orientalis* cv. *Compacta Aurea nana*, *Cupressus macrocarpa* cv. *Gold Crest.*, to detect any changes on irrigated soil properties and consequently, to evaluate the use of wastewater in water saving terms compared to freshwater use.

The experiment was conducted in the farm of University of Thessaly, during 2002 farming period. An automated subsurface drip irrigation system with laterals buried at a depth of 0.15 m, was used for water application. The experiment involved two water quality treatments. The first treatment accepted only fresh water. The second one, was irrigated periodically with treated wastewater supplied by the wastewater treatment plant of city of Volos and fresh water.

Two plant growth parameters were assessed at different times throughout the experimental season: the canopy diameter and the length of lateral-shoots. The experimental data revealed that the canopy diameter of all the plants was greater for the plots that received freshwater, yet not statistically significant. The side-shoot length of *Juniperus of chinensis* and *Cupressus macrocarpa* was greater for the freshwater plots but not statistically significant. Side-shoot lengths of *Thuja orientalis* were greater in plots irrigated with wastewater without significant differences, too.

Soil analyses were conducted in treatment received wastewater before and after the irrigation. No significant changes in pH, electrical conductivity and Fe, Zn, Cu, and Mn concentration were recorded.

At the end of irrigation period, freshwater irrigation treatment had consumed 475 mm of water while wastewater treatment consumed 300 mm of freshwater and 175 mm of wastewater. Consequently, the reuse of wastewater resulted in a 38 % saving of fresh water.

Key words: Wastewater, subsurface drip irrigation, ornamental plants, water saving.