The 1st International Conference on New Ideas in Agriculture
Islamic Azad University Khorasgan Branch
26-27 Jan. 2014, Isfahan, Iran

# THE EFFECTS OF INDUSTRIAL WASTE WATER ON SOME SOIL PROPERTIES BY PITCHER IRRGATION SYSTEM

A. Eftekhari[1], N. Honarjo[2], P. Najafi[3], K. Asgari[5] and N. Samadi[4]
[1] *Department of Soil science, Faculty of Agriculture, Islamic Azad University- Khorasgan branch*
[2] *Department of Water Engineering, Faculty of Islamic Azad University- Khorasgan branch*
[3] *Department of Water Engineering, Faculty of Islamic Azad University- Khorasgan branch*
[4] *Department of Soil science, Canada*
[5] *Department of Soil science, Wageningen University, Netherlands*
*Corresponding Author E-mails: eftekhari.arezo@yahoo.com*

## INTRODUCTION

Problems satisfying water resource needs or demands are affecting a growing proportion of the world, primarily in arid and semi-arid regions where population pressures are considerable and demand for water is currently rising faster than at any time previously (Rodda, 2001). The industrial wastewater is potentially useless before special treatment and management before using as irrigation water. In additional, using commercial application of zeolite and perlite cause to increase of quality of water irrigation as pitcher irrigation system because of three important absorbent properties: structure (high CEC and pores, availability and economic cost). The main objective of this research was the effect of irrigation with industrial wastewater on cation concentration of soil by pitcher irrigation method.

## MATERIALS AND METHODS

**This research was carried in khoradgan's farm under Olive cultured with arid-very hot and heavy texture. An experiment plan with 2 treatments (Clay pot included Vermiculite and rice husk with half of volume of total volume clay pot, 4.5 Litter) and 4 replications that irrigated by Zob-Ahan wastewater in 12 events (1.5 liter per each irrigation event). All analyses were done at beginning and end of experiment by APHA (1995). The pH and EC of soil were 7.6 and 4.1 dS/m and these parameters in wastewater were 8.5 and 1.6 dS/m.**

## RESULTS AND DISCUSSION:

The initial concentration of Ca, Mg, Na and K associated by wastewater were 5.5, 2, 9.8 and 0.7 me/ L, respectively. The concentration of cations decreased after 12 irrigation methods in soil because of happening rainfall about 188 mm. in the first stage, the content of cations declined by passing wastewater in zeolite or perlite media and the clay walls of pitcher where burred in soil as part of irrigation system. The Ca concentration decreased from 36 and 22 initail Ca concentrations in soil to 32.7 and 30.6 me/ L in the soils around clay pitcher included zeolite and perlite, respectively. On the other hand, Mg concentration dropped down about one third of initial Mg concentration. It was more than a decrease of Ca content. It indicated that the soil exchangeable sites have a natural propensity to adsorption and fitting Ca in their pores (Nazem, 2007).

In additional, the Na content of soil declined more than others. There was a decrease about a half of initial concentration. Based on the results, a decrease of K concentration was the least. The average value of these parameters had a significant difference at 1% percent level based on ANOVA test.

**Keywords:** Cation, Industrial wastewater, Pitcher irrigation system

## REFERENCES:

APHA, 1995. Standard method for the examination of water and wastewater. *American Public Health Association*, Washington, D.C., 1566 PP.

Rodda, J. C.2001. "Water under pressure." *Hydrological Sciences - Journal des Sciences Hydrologiques*, 46(6): 841-854.

Nazem, Z. 2007. Effects of land treatment application for treated leachate of Isfahan Compost Factory. M.Sc. thesis on soil science. Islamic Azad University- Khorasgan branch.