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## Evaluation of Hydrogel Application on Soil Water Retention Characteristics

Jahangir Abedi-Koupai,<sup>1</sup> Farahnaz Sohrab,<sup>2</sup> and Gareth Swarbrick<sup>3</sup>

<sup>1</sup>College of Agriculture, Isfahan University of Technology, Isfahan, Iran

<sup>2</sup>Isfahan University of Technology, Iran

<sup>3</sup>UNSW, Sydney, Australia

### ABSTRACT

Hydrogels can absorb irrigation and rain water and help to reduce deep percolation by using gravitational water as well as capillary water. The objective of this study was to evaluate the effect of hydrogels on soil water retention characteristic curve (WRC) using RETC computer model. The hydrogels, PR3005A and Tarawat A100 in four levels, 2, 4, 6, and 8 g/kg, were mixed with three soil textures, sandy loam, loamy and clay. The results showed that for each texture, hydrogels caused the residual water content ( $\theta_r$ ) and saturated water content ( $\theta_s$ ) to increase. Air entry value ( $h_p$ ), was observed to increase in sandy loam soil and decrease in the other soils. The results of the statistical analysis showed that there is significant difference between samples containing hydrogels and the control (without hydrogels) due to both the level of hydrogel application, and the type of hydrogel applied Available water content increased 1.8 fold of control in clay and 2.2 to 3.2 fold in loamy and sandy loam soil, respectively, with a hydrogel application of 8 g/kg.

**Keywords:** Soil water retention models, air-entry value, RETC, polyacrylamides (PAM)

### INTRODUCTION

The term hydrogel itself is rather generic referring to hydrogels used in oil recovery (Emesih et al., 1999), medical grafting supplements (Ohkawa et al., 1998), clarification of potable- and wastewater, dewatering sludge, mining separations,

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Address correspondence to Jahangir Abedi-Koupai, College of Agriculture, Isfahan University of Technology, Post Code 84156, Isfahan, Iran. E-mail: koupai@cc.iut.ac.ir