

# EFFECT OF HYDROPHILIC POLYMER AND WATER QUALITY ON CUCUMBER (*Cumis sativus* L.) GROWTH

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## ABSTRACT

A greenhouse study was conducted in a 10 kg pots filled with a 7 kg of moderately calcareous soil to investigate the effect of hydrophilic polymer on the growth of cucumber (*Cucumis sativus* L. cv. Dena) under different levels of irrigation water quality. The soil was mixed with hydrophilic polymer (Broadleaf P-4) at rates of 0.0%, 0.2%, 0.4% and 0.6% on dry weight basis. Four levels of irrigation water quality were used as follow; Tap water (0.5), 2, 4 and 8 dS m<sup>-1</sup> with constant level of sodium adsorption ratio (SAR=5). The results showed a significant increase in soil pH with increasing polymer rates and a significant decrease of pH with increasing EC at a given polymer rate. Plant growth and relative water content (RWC) were significantly increased with addition of 0.2% polymer rate, and significantly decreased at higher level of irrigation water salinity. No significant interaction was observed between polymer rates and irrigation water quality on the plant growth and RWC. The effect of polymer rates and irrigation water quality on the concentration of iron (Fe), copper (Cu), zinc (Zn), manganese (Mn) potassium (K), sodium (Na), nitrogen (N) and phosphorus (P) in the stem and leaves was also determined.

## INTRODUCTION

There has been growing interest over the last two decades in the use of hydrophilic polymer to improve soil physical properties and increase water use efficiency. These polymers proved to be effective in increasing water holding capacity and therefore stimulate plant growth (Al-Omran *et al.* 1987, Al-Harbi *et al.* 1994). These polymers also advanced flowering of tomato plants and enhanced the uptake of N, K, and P by the plants (Ouchi *et al.* 1990). However, few investigation have been undertaken to defined the effect of the polymers on chemical properties of coarse textured soils. Previous studies showed that synthetic polymers caused a significant increase in soil pH and EC when treated with deionized water (Falatah and Al-Omran 1995, Falatah *et al.* 1996).

Plant survival and growth were also increased by hydrophilic amendments. The improvement of water balance in the soil was resulted in a significant increase in the growth and yield of several horticultural