

Growth and Yield of Onion (*Allium cepa* L.) Cultivars under Different Levels of Irrigation Water Salinity

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Abstract. Seeds of ten onion (*Allium cepa* L.) cultivars; Dorado, Contessa, Texas Grano 502, UND Grand PRR, Giza 6, Creol Red, Texas Early Grano, Yellow Spanish, Long Day Ring Master and El-Hassawy, were grown in two greenhouse experiments at the Agricultural Research and Experiment Station, King Saud University. The experiments were conducted during 1997 and 1998 growing seasons to study the effect of irrigation water salinity on onion cultivars. In the second season (1998) Giza 6 cultivar was excluded due to its poor seed germination. The seeds were sown in 30 cm plastic pots filled with 10 kg of sandy soil. The seedlings received equal amounts of a balanced liquid fertilizer and five levels of irrigation water salinity with electrical conductivity (Ec) of 0.5 (Control), 2, 4, 6 and 8 mS cm⁻¹. The control was irrigated using tap water and the higher levels of salinity were achieved by adding mixtures of NaCl and CaCl₂ with a fixed level of sodium absorption ratio (SAR) (5). The vegetative growth components and bulb yield were measured in the tested cultivars. Salinity retarded onion vegetative growth. At the highest salinity level bulb fresh weight was reduced by 72.8 and 81.5% while bulb diameter was reduced by 50.2 and 51% in the first and second experiments, respectively. Contessa, Texas Grano 502 and Dorado gave the highest bulb yield in both seasons. No interactive effect between cultivars and salinity levels was observed on the growth and yield.

Introduction

Salinity is a major yield-limiting factor of crop growth and yield in one third of irrigated lands of the arid and semi-arid region [1]. Salinity is often defined as the presence of an access concentration of soluble salt in the root media, sufficient to suppress plant growth [2]. Salts stress influences both osmotic pressure of the soil solution due to high concentration of salts and anion balance in the plant cell [3].

Erdei and Kuiper [4] found that under saline condition, growth of salt sensitive and salt tolerant species were reduced according to the ecological features of these species. Shanon [5] has found also a wide range of variability in salt tolerance between a number of agronomic species. Growth and yield of onion were affected when the