

Calculation of Water Requirements for Some Crops in the Eastern and Central Regions of the Kingdom of Saudi Arabia

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Abstract. The aim of the current investigation was to calculate the total water requirements of some field crops, vegetables and fruits in the Eastern and Central Regions. Saline water having electrical conductivity (EC) values from 1 to 5 mmhos/cm were used to calculate the water requirements under surface and sprinkler irrigation systems. The potential evapotranspiration (ETp) was calculated according to Jenen-Haise equation.

The results reveal that leaching requirements (LR) of tolerant plants (as barley) are low compared to low tolerant plants (as corn and potato).

Under surface and sprinkler irrigation systems and zero % reduction yield due to salinity, the total irrigation requirements of wheat using water of 1 mmhos/cm were 757 and 883 mm, respectively. Whereas increasing water salinity up to 4 mmhos/cm, increased the above figures to 828 and 1024 mm, respectively.

For the barley, corn, tomato, potato, watermelon, lettuce and citrus, the total water requirements were 751, 1703, 691, 1482, 835 and 2259 mm, respectively, under sprinkler irrigation at EC_w of 1 mmhos/cm, and zero % reduction in yield due to salinity. For palm, the total water requirement was 4021 mm under surface irrigation at EC_w of 1 mmhos/cm, and zero % reduction in yield due to salinity.

The obtained results showed that the determining leaching requirements should be considered in calculating the total crop water requirements in the Kingdom of Saudi Arabia.