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SEASONAL WATER USE OF DATE PALMS IN THE CENTRAL REGION OF SAUDI ARABIA

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ABSTRACT

A field experiment was conducted to investigate the response of date palm trees, of Seleg cultivar, to different water regimes (50, 100 and 150% of pan evaporation rate), using three irrigation methods: basin, bubbler and trickle irrigation systems. The study was conducted during four successive years (1991 through 1994). The results of this study demonstrated the general trend of yield increase as irrigation quantity increases. The maximum yield was produced from palm trees irrigated with the trickle irrigation system followed by the basin method. The water use efficiency was found to be maximum for trickle irrigated plots followed by the basin plots.

Keywords: *Date palms, crop water use, water use efficiency, trickle irrigation, bubbler irrigation*

1. INTRODUCTION

Date palm tree (*Phoenix dactylifera, L*) is one of the main fruit trees in the Kingdom of Saudi Arabia. The tree is popular in the country and the total number of date palms are about 18.2 million, and is increasing every year. Its production has also increased to reach more than 0.6 million tons per year in 1996, grown in an area exceeding 95 thousand hectares (MAW, 1997). The date palm is a drought resistant and salt tolerant plant. It can tolerate soil salinity up to 4 dS/m without reduction in yield (Ayers and Westcot, 1985). The rooting depth of date palm ranges from 1.5 to 2.5 meters (Doorenbos and Pruitt, 1977), however, 65 to 80% of water is absorbed by roots within 1.2 meter depth (Yaaqoob, 1996). Date palm tree is usually irrigated by basin method, delivering an abundant amount of water based primarily on a farmer's experience. The annual water requirements for a mature date palm range between 115 and 306 cubic meters (1.15 - 3.06 m/ha) (Al-Baker, 1972). If the present trend of palm expansion continues, a considerable amount of irrigation water will be required. However, due to the limited availability of water resources in the Kingdom, the introduction of some water conservation measures, such as modern irrigation systems (trickle and bubbler), is necessary. Thus, the evaluation study of tree water use is important, as this will lead to accurate application of water to eliminate waste.

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