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Effects of Hydrophilic Polymer on the Survival of Buttonwood Seedlings Grown Under Drought Stress

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ABSTRACT

The effect of 0.0 (control), 0.1, 0.2, 0.4, and 0.6% of the hydrophilic polymer "Stockosorb K-400" hydrogel (HG) on survival and growth of buttonwood (*Conocarpus erectus* L.) seedlings grown in sandy soil under drought stress was investigated. The ability of the soil to retain water increased with increasing hydrogel concentrations. The highest level of the HG was capable of changing the typical sandy soil to a loam or even silty clay in terms of water potential and water content. The highest HG concentration prolonged the time of water loss from the soil by about 66% more than the control soil. During drought stress, the seedlings grown in 0.6% HG-mixed soil survived three times as long as those grown in the control soil. Shoot and root growth increased significantly in HG-amended soil as compared with non-amended soil. Plant water potential increased significantly with HG application, thus it aided in the establishment and growth of *C. erectus* seedlings under water stress conditions. There were no significant differences between 0.4% and 0.6%. The study indicated that an amendment of soil with 0.4% to 0.6% of the hydrophilic polymer "Stockosorb K-400" can be used in arid and semi-arid areas to enhance the drought tolerance of *C. erectus* seedlings.

Keywords: *Conocarpus erectus*, hydrogel, soil amendment, survival, water potential

INTRODUCTION

Ornamental and/or reforestation species must be adapted to growing conditions in the central region of Saudi Arabia, with lack of water, hot climate, low relative humidity, and high evapotranspiration states. Buttonwood (*Conocarpus erectus*

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