Studies on leaf Water Stress in Banana Plant in Relation to Soil Moisture

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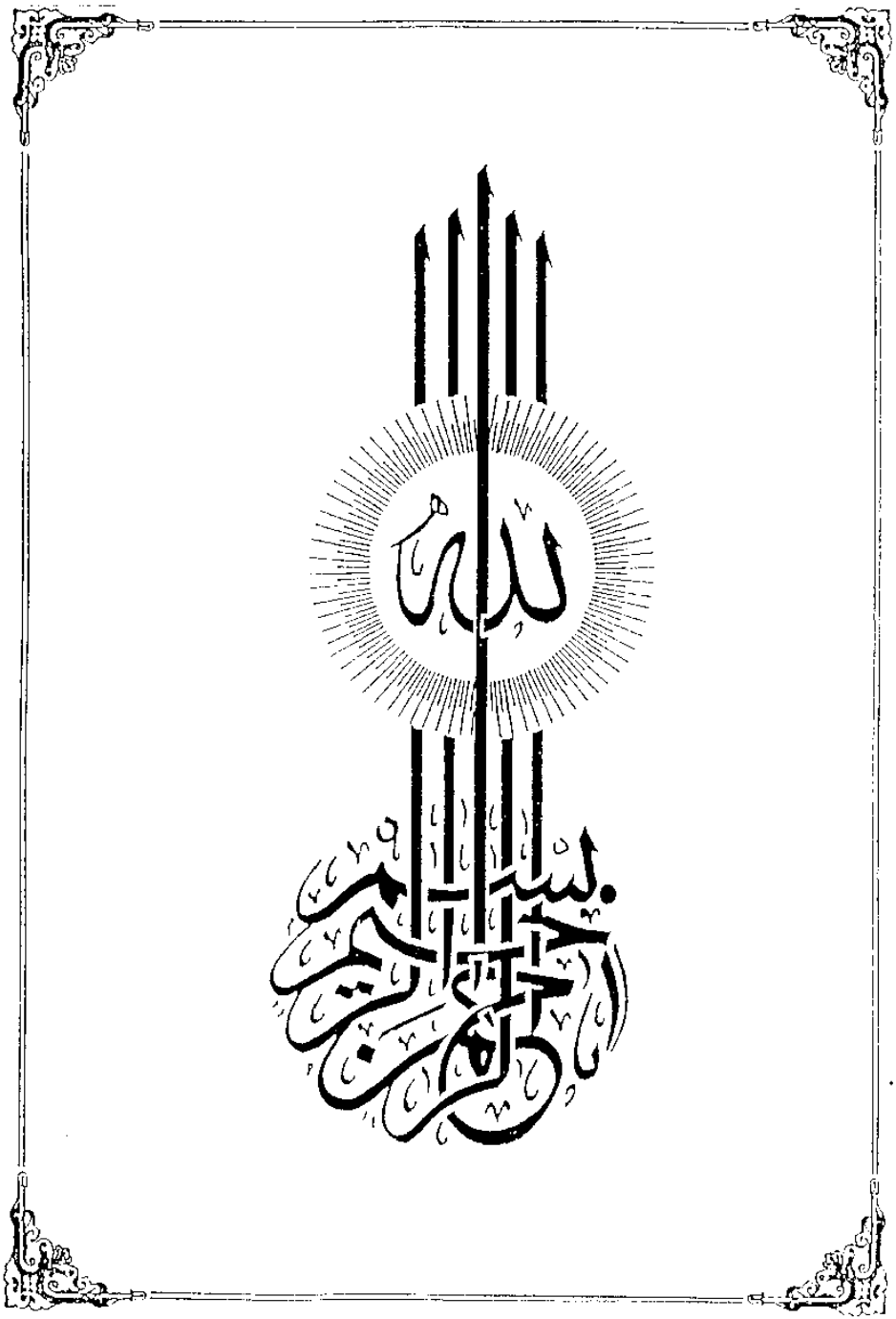

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C O N T E N T S

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INTRODUCTION

Introduction

Banana plant is believed to be originated in hot tropical regions of South Asia, probably in Indo Malysya regions . It is a tropical plant and it needs well distributed rainfall, or regular irrigation through the year, and absolutely no frost in winter .

It had been disclosed by Behairy (1978) that the most suitable growth and high banana yield could be attained under 75% level of the available soil moisture all over the year under Egyptian conditions .

Meanwhile, the relationship between leaf water stress and soil moisture and their effects on stomatal numbers , leaf anatomy, and plant growth remained to be investigated.

Accordingly, this study was selected to give further information on these fields using the Hindi cultivar, the most wide spread cultivar in Egypt as the material for this study .

REVIEW

Review

2.1. Effect of irrigation treatments on leaf water stress :

Boyer (1973), carried out an experiment on the effect of water potential on transpiration, stomatal opening and vegetative growth in young Cacao in soil maintained at field capacity or subjected to flooding or drying treatments . He found that, both the leaf water saturation deficit and leaf water potential were determined as indicators of plant moisture status .

Moatani et al (1977), suggested that, trunk growth was more sensitive to leaf water stress than leaves . Leaves stopped growing when Ψ was dropped to about -8 bars and -15 bars -20 bars, respectively in satsuma .

Takano (1977), found that, on summer days with temperatures of 30° - 36°C water saturation deficit (WSD) in leaves was at its maximum value (13%) in the morning and decreased during the rest of the day .

Fereres et al (1979), exposed valencia orange trees to a single water stress, under field conditions at Tacna, Arizona, Rehydration began immediately after irrigation

and leaf water potentials reached normal values in less than a week .

Ashizawa et al. (1979), found that, the leaf water potential (LWP) of satsuma in watered soil was highest (about -3 bars) before sunrise, and there was close correlation between LFW and weather conditions . On clear day the variation during the daytime was very large, but on cloudy days it was small, LWP was strongly affected by light intensity and to a lesser extent by air temperature . It is suggested that in the field LWP can be used to estimate irrigation time .

Levy(1983),used Alemow(Citrus macrophylla) seedlings which were subjected to moderate or severe stress by watering them at different intervals for several irrigation cycles . He found that, severe water stress reduced transpiration but increased leaf water potential while moderate water stress reduced transpiration less and did not affect leaf water potential . It is suggested that moderate water stress influence only stomatal conductance and not root and shoot resistance .