EVAPOTRANSPIRATION OF SOME CROPS

By

Mohob Ramzy Semaika

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Name : Moheb Ramzy Semaika

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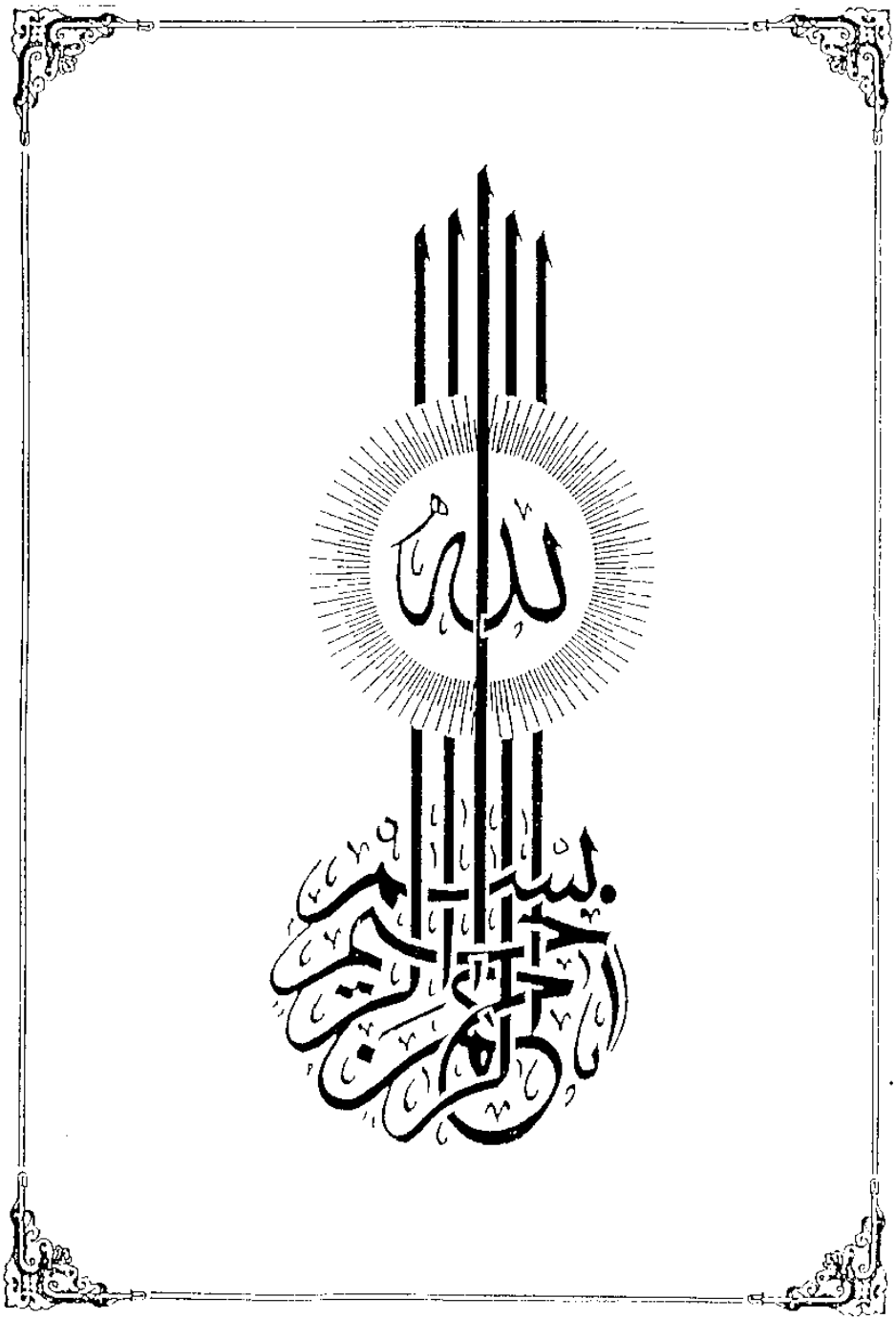

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I- INTRODUCTION

In all countries, all over the world, water is considered a limiting factor in agricultural expansion. The various phases of water consumption, are direct use by human beings, animals, industry and irrigation. As population increases, greater competition among the various phases makes conservation of water imperative.

Agriculture is, by no means, the major competitor for water consumption. Adding too much or too little water may cause a serious damage for crops. Consequently, water requirements must be carefully determined.

In order to achieve this goal, the evapotranspiration (consumptive use of water) for each crop growing in various soil types under different climatological conditions, must be calculated so as to evaluate the water regimes. This could be aided by the determination of the periodical evapotranspiration rates for each crop and define the most critical periods in which a crop either requires maximum or minimum amounts of water.

Measuring or calculating evapotranspiration rate could be achieved by many ways such as soil moisture depletion method and using the meteorological data throughout the growth season. The later method leads

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to evaluate an imperical constant, for specific vegetation grown in particular location, which can be used afterwards as an index for direct calculation of evapotranspiration.

In the current study, three of most important crops grown in Egypt were chosen; namely sugar beet, onion and field beans. They were cultivated in three different soil types; calcareous sandy loam, clay and sand soils under different levels of soil moisture depletion in the root zone, to evaluate their interrelations on the evapotranspiration rate and the values of the imperical constants for both Eagleman and Blaney and Criddle formulae.

Since agricultural development should be based on irrigation economy, water economy (efficiency of water utilization) was calculated for every crop and some of its components in order to evaluate the most economic one.

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