PHYSIOLOGICAL STUDIES ON VIABILITY AND YIELD OF SPINACH SEEDS

BY

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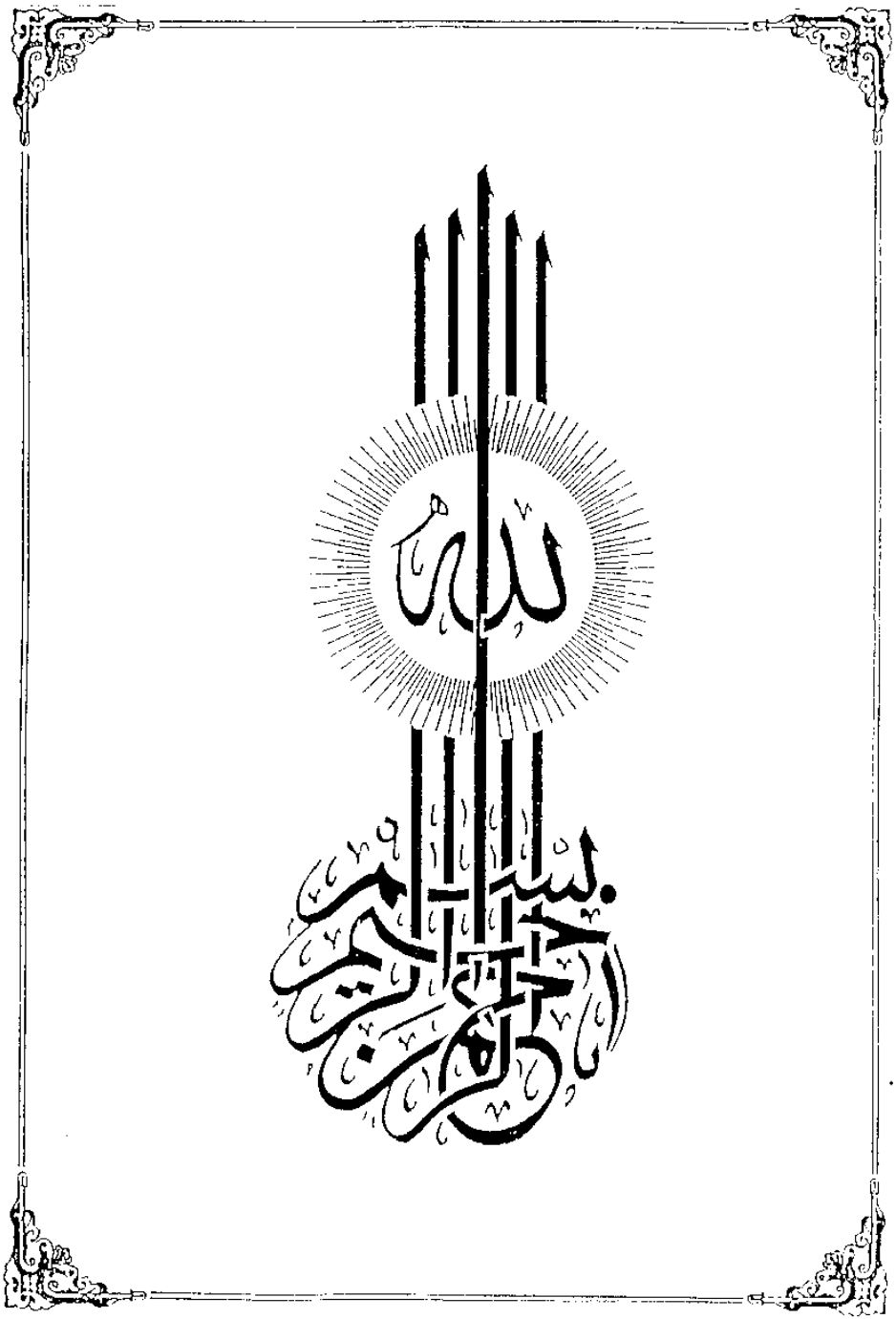

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ABSTRACT

The effect of sowing date, rate and number of nitrogen applications and some growth regulators on growth, viability and yield of spinach seeds were investigated. The results could be summarized as follows:

1. A significant favourable effect on growth, chemical composition, number of female plant (decrease sex ratio), and seed yield were obtained by early sowing (Nov. 20th). Whereas, the emergence of seed stalk, chlorophyll a were significantly promoted by late sowing date (Jan. 1st). Neither weight of 1000 seeds nor seed viability of the produced seeds and their seedling length were

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significantly affected by sowing dates.

2- Applying nitrogen at rate of 60 and 120 kgN/fed. increased significantly plant growth, seed stalk emergence chemical composition, number of female plants, seed yield as well as weight of 1000 seeds and hypocotyl length of the subsequent produced seeds, whereas, seed viability was not significantly affected.

3- Splitting the applied nitrogen at two or three doses had significant increase on seed yield, while, it had no significant effect on growth, rate of seed stalk emergence, chemical composition and seed yield components.

4- Spraying spinach with various GA3 and Alar concentrations significantly increased plant growth, total carbohydrate percentage and seed yield. Increasing GA3 concentration significantly decreased chlorophyll a, the total chlorophyll a+b, total nitrogen percentage number of days for emergence of seed stalk and number of female plants while Alar tended to show an opposite trend. No significant effect on weight of 1000 seeds, seed viability of the produced seeds as well as their seedling length was obtained as a result of GA3 and Alar applications. The combined treatment of GA3 and Alar did not exert further significant increase as compared with those induced by growth regulators alone.

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DEDICATION

I WOULD LIKE TO DEDICATE
THIS THESIS TO MY WIFE AND
CHILDREN WHO ALWAYS
ENCOURAGE ME TO GET
THIS WORK DONE

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INTRODUCTION

Spinach plants (Spinacia oleracea L.) is known to be one of the popular leafy vegetable crops. The average cultivated area of spinach crop druing the period 1983-1986 was 5855 feddan in Egypt* and 1324 feddan (2225 donum) in Iraq.** Accordingly, the amount of required seeds for that areas were 64405 and 14564 kgs, respectively. These figures highlights the importance of spinach seed production under the local conditions to provide the local market demand.

New seed production and technology nowadays depend upon modern ways of producing high seed yield with the best quality. This implies not only the proper gentic composition, but it could be achieved by adapting suitable cultural practies, i.e. the optimum sowing date, fertilization and growth regulators application.

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* Ministry of Agriculture, Egypt.

** Ministry of Planning, Iraq, (donum = 2500 m^2).

Suitable sowing date of spinach is known to be the most important factor which control growth, flowering and seed production.

Nitrogen being the major nutrient element , that has the greatest effect on spinach plant growth and in turn producing seeds.

Recently, some investigators had shown that application of growth regulators had a favourable effect on flowering and seed production of some plant species.

The present investigation was mainly conducted to study the effect of sowing date, rate and number of nitrogen applications and two growth regulators on growth, seed yield and quality of spinach (cv. Salonikey).