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EFFECT OF MINERAL FERTILIZATION AND SOWING DATES ON GROWTH AND YIELD OF SAFFLOWER PLANTS (*CARTHAMUS TINCTORIUS L.*)

BY

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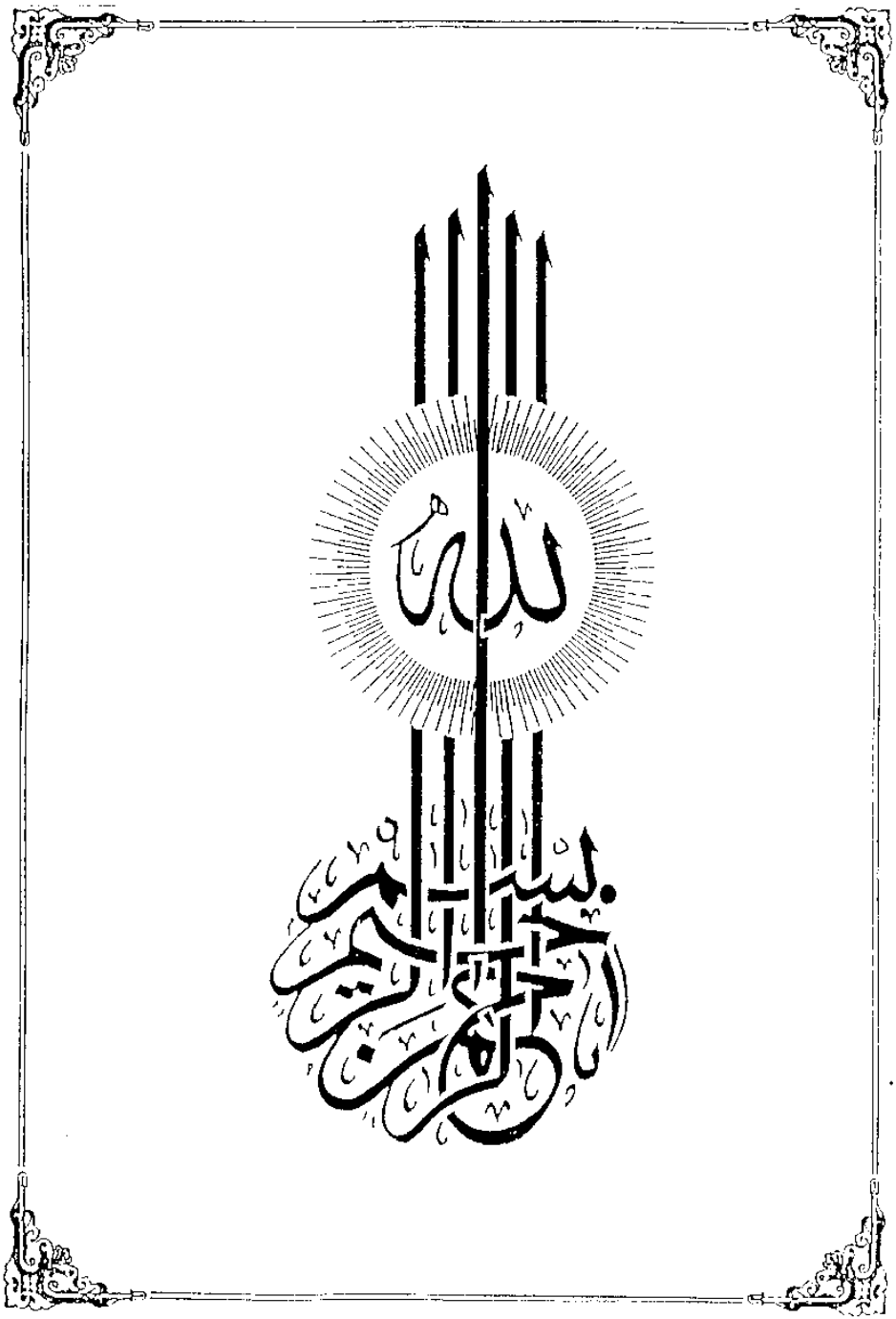
Date of examination 9/9/ 1991

Acknowledgement



ACKNOWLEDGEMENT

The author wishes to express his deep sincere apprecation and gratitude to Prof. Dr. A.A. Abd El-Gawad, Professor and head of Agronomy Department, Faculty of Agriculture, Ain Shams University, Prof. Dr. D.M. El-Hariri, Professor of Agronomy, National Research Centre and Dr. A.M. Abo Shataia, Associate Professor of Agronomy, Faculty of Agriculture, Ain Shams University for suggesting the problems supervision and continous help through the course of this study.

Special thanks and gratitude are also given to Dr. M.A. Ahmed, Associate Professor of Agronomy, National Research Centre for his valuable guidance and fruitful advice during the preparation of this manuscript.

I am also offer my great thanks to all members of Botany Department and Experimental Station staff of the National Research Centre for financial suport and facilities offered.

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ABSTRACT

Three field trials were carried out at the Agricultural Experimental Station of the National Research Centre at Shalakan, Kalubia Governroate, during 1986/1987, 1987/1988 and 1988/1989. These experiments aimed to study the growth and yield of safflower plant in relation to sowing dates and macronutrient elements, i.e. nitrogen, phosphorus and potassium. The results of these investigations could be summarized as follows:

Medium sowing dates (Middle November) surpassed significantly early (Middle October) and late (Middle December) in number of branches, heads/plant. Applying nitrogen at 20 - 40 kg/fed. and phosphorus at 15.5 - 31.0 kg/fed. as well as potassium at 12 kg/fed. showed an increase in plant height, number of branches, number of heads/plant, number of seeds/head, seed index, oil percentage and protein percentage.

Head diameter showed insignificant relationship to sowing dates, nitrogen levels, phosphorus levels and potassium levels.

Medium sowing date, nitrogen level at 40 kg/fed., phosphorus level at 15.5 to 31.0 kg/fed. and potassium at the level of 12 kg/fed. gave higher values for straw, seed, oil and protein yield/fed. Insignificant relationship was detected between crop index, harvest index and sowing dates, nitrogen levels and phosphorus levels. Significant interactions were observed between nitrogen and phosphorus levels, nitrogen and potassium as well as phosphorus and potassium on straw as well as seed yield/fed.

Moreover, significant interactions between nitrogen, phosphorus and potassium were also detected on straw and seed yields/fed. especially at early and late sowing dates.

Medium sowing date, nitrogen at 40 kg/fed. phosphorus at 31.0 kg/fed. and potassium at 12 kg/fed. increased plant height, number of leaves, dry weight of stem, dry weight of leaves and leaves area/plant. There was an increase in plant height, number of leaves, dry weight of stem, dry weight of leaves with advancement of plants towards maturity while leaves area/plant and leaf area index reached their maximum values at 90 days old.

Nitrogen, phosphorus and potasisum percentage in stem and leaves of safflower did not respond significantly to each of sowing dates, nitrogen levels, phosphorus levels and potassium levels.

INTRODUCTION

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Safflower (Carthamus tinctorius, L.) is an annual plant belongs to the botanical family compositea. It is one of subtropical crops which grown in many different parts of the world as an important oil crop. Seeds of safflower contain about 30 - 40% of oil as well as 18 - 25% of protein. In Egypt, safflower plants has been grown from long time in limited areas around fields to obtain its natural dyes which are still in use for cloth dying and some oriental foods. It is well known that Egypt was a self sufficient in oil industry till the early 1960's. Now the total annual consumption of edible oils is about 600 thousand tons, but the local production represents only about 20% of our needs.

Egypt depends mainly on cotton seeds and soybean for oil industry, but these two crops failed to cover oil industry requirements. It appears that there is lack in local oil production and this will be expected to increase owing to greater consumption in addition to the gradual increase in population.

For these reasons, it is necessary to introduce new oil crops to overcome the gab between production and consumption of oils. One of these promising crops is safflower. Also, safflower plant, as a winter crop supplies

oil industry mills with row material during the cretical period of the year hence, other oil crops in Egypt are summer crops. From the economical point of view, this enable oil mills to be utilized all over the year. The government is pressing hard to encourage growing other oil crops such as safflower to minimize the gab in oil industry. This could be achieved by growing the suitable cultivar under proper environmental conditions. Mineral fertilization and sowing dates can realize this goal.

This work was carried out to investigate the influence of differen sowing dates and different levels of macronutrients on growth and yield of safflower. More attention has been given to the interaction of these factors to maximize yield of safflower.