EFFECT OF SOME CULTURAL TREATMENTS ON SEED PRODUCTION AND QUALITY OF MELON

BY

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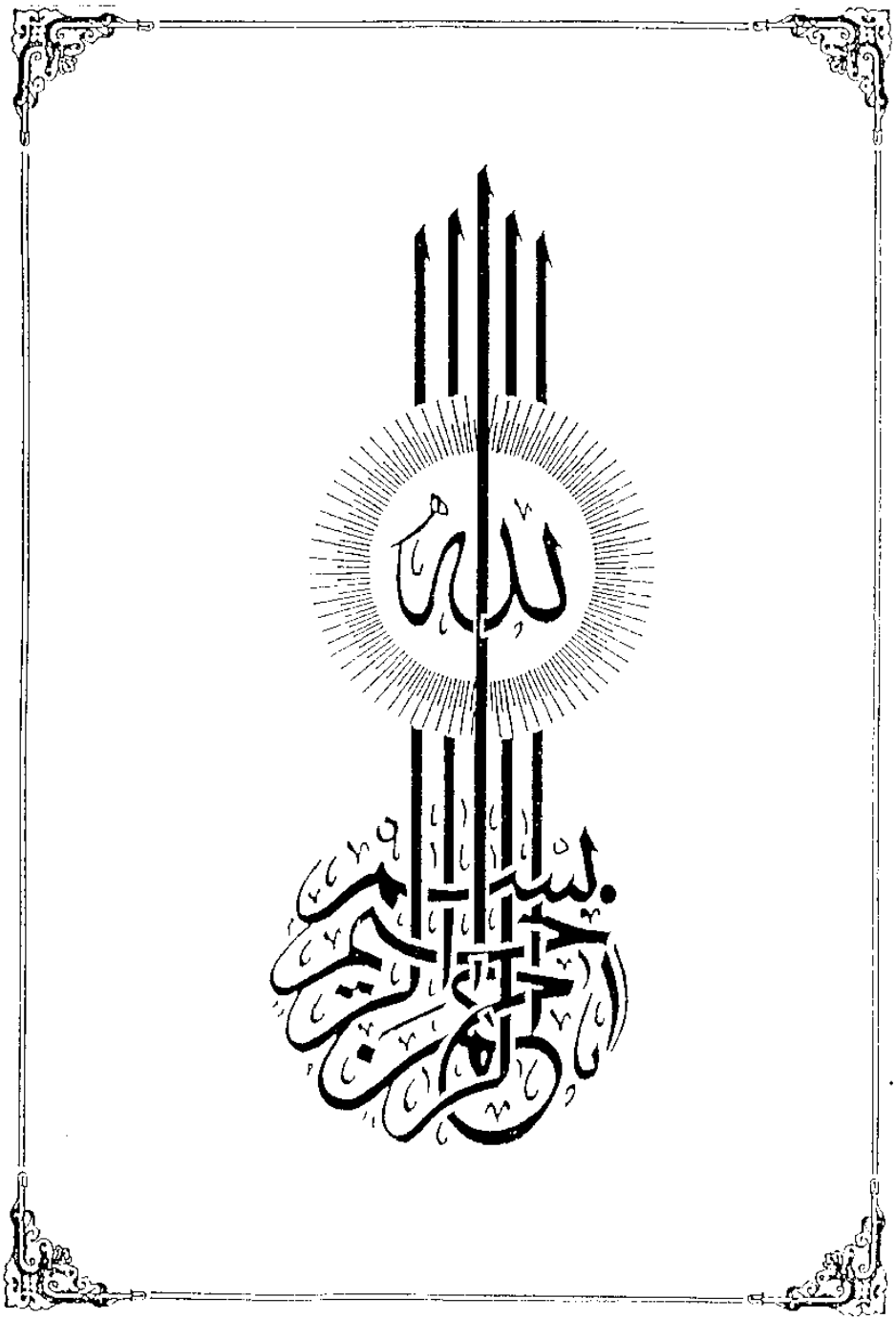

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

Abstract

AbdAlla Abdel-Azez Ghoname, Effect of some cultural treatments on seed production and quality of melon. Unpublished Master of Science, Ain Shams University, Faculty of Agriculture, Horticulture Department, 1995.

*Field studies were conducted in 1993 and 1994 seasons in Shalakan experimental station.(Kaluobia Governorate) to study the effect of three sowing dates (15 th March, 31 st March and 15 th April) and five rates of potassium application (without addition, 48, 72, 96 and 120 Kg k_2 o per feddan) on the growth, fruit quality, seed yield and its quality of melon (**Cucumis melo L.**) cv. " Shahd El-Dokki ".*

The values of plant length, number of shoots per plant, fresh and dry weight of both leaves and shoots were highest on 15 th March sowing and 120 kg $k_2$0 per feddan in both seasons. However, the highest values of number of fruits per plant were obtained from the early sowing date i.e., 15 th March and 120 kg $k_2$0 per feddan . Moreover, the heaviest and largest fruits were recorded on 15 March sowing and 48 kg $k_2$0 per feddan in both years. The best flesh thickness was obtained from the first sowing date and 72 kg $k_2$0 per feddan , while the highest potassium percentage in fruit produced from plants received 120 kg $k_2$0 per feddan in the first sowing date. Early sowing date and 72 kg $k_2$0 per feddan gave the highest weight of seeds per fruit, 1000 seeds weight and total seed yield per feddan .

The best seed germination percentage and dry matter content in seedlings occurred on 15 March sowing and 72 kg $k_2$0 per feddan .

KEY WORDS

Melon, Sowing date, Potassium fertilizer, Seed yield, Seed quality

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1- INTRODUCTION

Melon (*Cucumis melo* L) is one of the major summer vegetable crops in Egypt for local consumption and export. Melon is grown for home and market use. There is a great demand in melon fruit and seeds.

The area cultivated with melon in Egypt (1994) was about **37230** feddans which produced about **353754** tons with an average yield of **9.54** tons per feddan. The increase in melon production could be achieved by growing good seeds and /or fertilizer to increase the total yield per feddan. This yield needs more attention as for as the factors affecting the yield of melon are concerned. One of these factors is the quality of seeds used in cultivation. It is true that successful melon production is dependant upon a supply of satisfactory seeds. Most of this seeds are imported from abroad . The second factor is fertilizer, mainly potassium . Sowing date affected plant growth, fruit yield, fruit weight and size. Potassium fertilizer stimulate vegetative growth, increase fruit number per plant, yield, average fruit weight, fruit size and fruit T.S.S. content.

The weather conditions in Egypt could help our counntry to be one of the main producers of vegetables seeds. One of the important factors which play an important role on fruit set and development and affecting the productivity and quality of melon seeds is sowing dates and also potassium fertilizer. There are variable results for the effect of sowing date and potassium fertilizer on seed yield and quality.

This work aimed to investigate the effect of sowing dates and potassium fertilizer on the production and quality of melon fruits and seeds to find the best date of sowing and optimum amount of potassium fertilizer for a satisfactory fruit yield and quality as well as seed yield and quality.

2-REVIEW OF LITERATURE

2.1. Sowing date

Different planting or sowing dates are usually accompanied by differences in the prevailing temperature, humidity and light intensity .

These factors have normally a clear effect on plant growth and yield of many vegetable crops . However, sowing date and its effect on the vegetative growth and yield is a part of this investigation .

2.1.1. Effect of sowing dates on the vegetative growth characters .

In Egypt, El-Dweny (1978) mentioned that early sowing date (15Feb.) of melon varieties resulted in strong growth and healthy plants (expressed as plant length, number of leaves and branches per plant) than those sown on 15 March and 15 April . In Iraq,Ezuddin et.al. (1989) studied the effect of sowing dates (20 Mar, 4 Apr, 4 and 19 May) on the growth of snakemelon cv. " Mousulli ". They found that delaying sowing date caused a significant decrease in tops dry weight by about 60 % .

2.1.2. Effect of sowing date on fruit yield :

Pierce and Peterson (1961), in U.S.A, found that the yield of melon per acre resulted from plants sown on 20 April (the early sowing date) was 1.27 tons greater than the yield of those sown on 4 May (the late sowing date) and a similar response was observed for early yield .In addition, Khirstov (1983), in Bulgaria, reported that delaying sowing or planting dates reduced yields of melon cv." Desertnay " by about 20 % than early sowing date. . In Iraq, Ezuddin et al. (1989) sowed the seeds of snakemelon cv. " Mousulli " on 20 March,4 April,4 and 19May. they found that delaying sowing date caused a significant decrease in total fruit yield per donum and the highest total fruit yield per donum was resulted from sowing on 20 March and 4 April . In Jamica, McGlashan and Fielding (1990) reported that the highest yields of muskmelon cultivars were obtained with the early sowing date.

sowing date compared with 15 April and 15 May sowing dates of water melon cv."Giza 1". He also reported that sowing date had no effect on seed germination percentage and rate.

2.2. Potassium fertilizer.

2.2.1. Effect of potassium fertilizer on the vegetative growth:

The effect of potassium fertilizer on the vegetative growth of some vegetable crops has been studied by many investigators. El-Baz (1963) found that 0 and 150 kg.of potassium sulphate per feddan had no significant effect on the length of plant, number of leaves per plant or the dry matter content of leaves of sweetmelon. However,it stimulated the production of stems and increased the dry matter content per plant with increasing potassium fertilization level . Dufault (1986) also showed that increasing potassium rates from 10 to 250 mg/litre increased muskmelon seedling height, stem diameter and leaf area. He added that vining, female flowering and furit set increased as potassium levels increased. In addition, Singh and Chhonkar (1986) found that application of k_2o at 50 kg/lha to muskmelon cv. " Jaunpuri " gave the best vegetative growth, increased the length of main shoot, the number of leaves on the main shoot and the number of sub shoots .

2.2.2. Effect of potassium fertilizer on fruit yield :

El-Baz (1963) found that potassium had no significant influence on the yield of sweetmelon and the number of fruits . On the other hand, Roorda van Eysinga and Meys (1982) found that potassium application increased average fruit numbers per plant of Polydor and Haon melon cvs. grown under glasshouses. Prabhakar et.al (1985) found that k_2o at 60 kg/ha gave (16%) yield increase over the zero rate of muskmelon cv. " Haramadhu" . Dufault (1986), indicated that increasing potassium rates from 10 to 250 mg/ litre on the nutritional solution resulted in the highest fruit yield of muskmelon. He added that this yield increases were generally attributable to an increased number of fruit poduced and not to an increase in fruit size.

seed yield of pea cv. "Sprite" either at 1.11 or 2.27 ton k/ha. Moreover, Gavras (1989) reported that seed yield of *(Phaseolus vulgaris)* cv.Cascade increased with increasing potassium rates. On the contrary, Hadavizadeh (1989) stated that increasing potassium nutrition had no significant effect on seed yield of pea cv." Sprite" but significantly affected the number of seeds/ pod. whereas, El-Sheekh et. al. (1993) indicated that increasing potassium fertilizer from 0 to 24 kg k_2o/fed. increased the weight of seeds /umple as well as seed yield per feddan of onion plants cv. "Giza20".

2.2.5 Effect of potassium fertilizer on seed quality :

Ahmed (1982) found that mother plants of onion (*Allium cepa* L.) which had received high potassium levels in their first year produced high quality seeds in their second year. In addition, Osman and George (1984) found that the high potassium level (2800 kg k/ ha) gave the lowest mean time to germinate and the highest germination percentage of sweet pepper seeds . Also, George and varis (1985) found that 766 kg k/ha increased the quantities of high quality seeds of tomato plants. They reported that the weight of seed, the average weight of seeds per fruit and the 1000 seeds weight were highest in tomato plants received 0.93 g k/pot compared with plants received 0 k. They added that increasing potassium fertilization rate increased the germination percentage and rate . Seno et.al. (1987) reported that the effect of potassium fertilizer on seed quality of tomato was variable . However, Hadavizadeh and George (1988) found that potassium nutrition had a little effect on the seed vigour of pea cv. "Sprite" either at 1.11 or 2.27 ton.k /ha . Moreover, Gavras (1989) reported that seed quality of (*Phaseolus vulgaris*) cv. "Cascade" increased with increasing potassium rates, On the contrary, Hadavizadeh (1989) found that increasing potassium nutrition had no significant effect on seed quality of pea. El-Sheekh et. al. (1993) reported that increasing potassium fertilizer level from 0 to 24 kg k_2o/fed. increased the weight of 1000 seeds as well as the germination percentage of onion seeds cv. " Giza 20" .

3- MATERIALS AND METHODS

This work was carried out in the agricultural experimental station of the National Research Center at Shalakan (*Kaluobia Governorate*) during the two successive seasons of 1993 and 1994 to study the effect of sowing dates and potassium fertilizer on the production and quality of melon seeds (*Cucumis melo* L) cv. " Shahd El-Dokkhi " .The experiment was carried out on a clay soil with pH of 7.8. The physical and chemical analysis of the soil is presented in table (A) .

Sowing of seeds took place on 15 th March, 31 st March and 15 th April of 1993 and 1994 years. After emergence seedlings were thinned to one plant per hill.

3.1. Experimental design :

The present work was undertaken to study two factors namely : sowing dates and potassium fertilization level. The split plot design with four replications was used. The main plots consisted of three sowing dates, 15 th March (representing the early sowing date), 31 st March (representing the medium sowing date) and 15 th April (representing the late sowing date).

The sub plots were assigned for five levels of potassium (zero, 48,72,96 and 120 kg k_2O) per feddan. Potassium sulphate (48 % k_2o) was used as a source of potassium .

The experimental plot contained four ridges of 1.3 m. apart and 4.5m. long . Three to five pre germinated seeds were sown in hills at 50 cm apart on the north side of the ridge.

Concerning fertilizer application , all treatments received 150 kg calcium superphosphate (15.5% P_2O_5) and 300 kg ammonium sulphate (20.5%N) per feddan. All calcium superphosphate was added during soil preparation . The nitrogen fertilizer was added in two equal parts (30 and 60 days after sowing). The potassium fertilizer was added to the plots assigned for each potassium treatment, one half after thinning and the other at the flowering time. The normal cultural practices of melon production were followed in this work .

Table(B) Maximuum and minimum temperature of Shalakan region during the growing seasons of 1993 and 1994

	1993			1994	
Month	Weak No.	Maximum temp. (°c)	Minimum temp(°c)	Maximum temp. (°c)	Minimum temp. (°c)
March	1	25	14	21	7
	2	22	11	18	8
	3	21	11	22	8
	4	26	15	24	8
April	1	26	15	28	9
	2	31	18	28	9
	3	32	21	35	15
	4	30	18	35	13
May	1	30	22	30	12
	2	31	23	34	14
	3	33	23	35	17
	4	33	24	36	18
June	1	31	16	34	16
	2	34	17	34	15
	3	36	17	37	17
	4	35	16	35	18
July	1	35	18	36	19
	2	35	17	35	18
	3	33	16	35	19
	4	34	17	38	19