

WATER AND FERTILIZER MANAGEMENT OF CANTALOUPE CROP UNDER DRIP IRRIGATION SYSTEM

By

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B. Sc. ,Agric. Sc. (Soil and Water), Bani-Walid University, Libya, 2008.

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ABSTRACT

Mohammed Ali Moftah: Water and Fertilizer Management of Cantaloupe Crop under Drip Irrigation System. Unpublished M. Sc. Thesis, Department of Agricultural Engineering, Faculty of Agriculture, Ain Shams University, 2015.

The aim of this study was to investigate the deficit conditions on dripped cantaloupe crop yields and quality under old lands conditions of Egypt. Field experiments were carried out under open field conditions on a clayey soil at Shalaqan, Experimental Farm of Faculty of Agriculture, Ain Shams Univ. Qalyubia Governorate, Egypt, during the season of 2014. The deficit conditions consisted of three irrigation water levels (100% ,80% and 60% of ET_c) and two N fertigated regime treatments (100% and 50% of the recommended rate). With this respect, a split plot design with three replicates was implemented. Results indicated that the soil moisture content increased near the emission point and then decreased horizontally and vertically. A decrease of salt concentration below the emitter, while incense away horizontally and vertically for all of the studied coefficients. Regarding the cantaloupe response to the deficit conditions, data analysis revealed that highest total yield was obtained under fully irrigated condition of (100% E_tc and 100% N). On the other hand, data analysis of deficit conditions indicated significant increment of total yield with increasing irrigation level. On the other hand, the highest IWUE value (10.21 kg/ m³) was obtained by using 60% of E_tc treatment, while , the lowest IWUE value (7.96 kg/ m³) was obtained by using 100% E_tc treatment. Regarding capital costs of irrigating cantaloupe, data indicate that it had been increased from 401.22 to 534.96 to 668.7 LE/fed by increasing irrigation treatments from 60%, 80% and 100% of E_tc. Meanwhile, the highest production costs of one ton was 52.33LE/ton at the treatment of 100%E_tc and 50%N, while the lowest value of costs was 40.77 LE/ton at 60%E_tc and 100%N.

Keywords: Soil Moisture, Salt Distribution, Water Use Efficiency, Nitrogen Use Efficiency Drip irrigation, Cantaloupe.

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CONTENTS

No.	Title	Page
	LIST OF TABLES	IV
	LIST OF FIGURES	V
1.	INTRODUCTION	1
2.	REVIEW OF LITERATURE	4
2.1	Definition, Identifying and Management Criteria of Drip Irrigation Systems :	4
2.1.1.	Definition and Identifying of Drip Irrigation Systems :	4
2.2	Yield, Yield Components and Quality in Response to Deficit Conditions under Drip Irrigation Systems:	17
2.2.1	Crop Components Parameters:	17
2.2.2	Yield Productivity :	19
2.2.3.	Water and Fertilizer Use Efficiency :	20
2.2.4	Quality Parameters :	21
2.2.5.	Cost Analysis and Crop – Net return under Drip Irrigation Systems :	27
3	MATERIALS AND METHODS	29
3.1	General Description of the Experimental Site and Investigated Crop:	29
3.2	Soil and Irrigation Water Analysis:	29
3.3	Drip Irrigation Network description:	29
3.4	Experiment Layout :	30
3.5	Statistical Analysis:	31
3.6	Estimation of Cantaloupe Crop Water Use:	32
3.7	Irrigation Water Requirements Calculation Method :	33
3.8	Evaluation Parameters of Drip Irrigation System:	34
3.8.1	Manufacturer's coefficient of variation (Cv):	34
3.8.2	Distribution Uniformity (DU):	34
3.8.3	Emission Uniformity (EU):	35
3.8.4	Application Efficiency (Ea):	36
3.9	Deficit Irrigation Conditions and Treatments:	37
3.10	Soil Moisture and Salt Distribution Patterns:	38

3.11	Measurements and Calculations:	38
3.11.1	Laboratory and Field Instrumentation:	38
3.11.2	Productivity and Fruit Quality Parameters:	40
3.12	Water Use Efficiency (WUE):	40
3.13	Nitrogen Use Efficiency (WUE):	41
3.14	Irrigation Cost :	41
4	RESULTS AND DISCUSSION	44
4.1	Evaluation of Surface Drip Irrigation System Network :	44
4.1.1	Manufacturer's Coefficient of Variation (Cv):	44
4.1.2	Distribution Uniformity (DU%)	44
4.1.3	Emission Uniformity (EU):	44
4.2	Cantaloupe Crop Water Use and Seasonal crop Water Use under Deficit Drip Irrigation Conditions.	45
4.3	Distribution Patterns of Soil Moisture and Salts Accumulative under Deficit Drip Conditions.	47
4.3.1	Soil Moisture Distribution Pattern under Drip Irrigation System.	47
4.3.1.1	Soil Moisture Distribution below the Lateral at Different Irrigation Treatments .	47
4.3.1.2	Soil Moisture Distribution at the Mid –Distance Between the Laterals at Different Irrigation Treatments.	47
4.3.2	Salt accumulative and Distribution Patterns.	50
4.3.2.1	Salt Distribution for the Treatment of 50% of Recommended Rates of Fertilizers:	50
4.3.2.2	Salt Distribution for the Treatment of 100% of Recommended Rates of Fertilizers:	55
4.3.2.2	Salt Distribution Pattern at Mid-Distance Between the Laterals.	55
4.3.2.2.1	Salt Distribution of the Treatment of 50% of Recommended Rates of Fertilizers:	55
4.3.2.2.2	Salt Distribution for the Treatment of 100% of Recommended Rates of Fertilizers:	56
4.4	Effect of irrigation and fertilization treatments on Total Yield of cantaloupe fruits.	56
4.5	Effect of Irrigation and Fertilization Treatments on number of Fruits per Plants :	60
4.6	Effect of Deficit conditions on Cantaloupe Fruit Quality:	61

III

4.6.1	Average Weight, Flesh Thickness, Length and Diameter of Fruit:	61
4.6.2	Average Firmness, Total Soluble Solids and Total Sugars of fruit:	65
4.7.	Effect of Irrigation and Fertilization Treatments on water and Nitrogen Use Efficiency .	68
4.7.1	Effect of Irrigation and Fertilization Treatments on Irrigation Water Use Efficiency (WUE) of Cantaloupe Fruits.	68
4.7..2	Effect of Irrigation and Fertilization Treatments on Nitrogen Use Efficiency (NUE) of Cantaloupe Fruits.	68
4.8	Irrigation Costs:	70
5	SUMMARY AND CONCLUSION	72
6	REFERENCES	75
7	ARABIC SUMMARY	

LIST OF TABLES

No.	Title	Page
1	Physical and Chemical Properties of Soil .	30
2	Chemical Analysis of Irrigation Water.	30
3	Recommended Classification of Manufacturer's Coefficient of Variation (Cv) .	35
4	Recommended Ranges of design Emission Uniformity.	36
5	Data for Estimating Distribution Uniformity for Drip Irrigation System.	45
6	Estimated and Applied Seasonal Irrigation Water of Cantaloupe Crop under Studied area Conditions.	46
7	Effect of Irrigation and Fertilization Treatments on Total Yield of Cantaloupe Fruits.	60
8	Effect of Irrigation and Fertilization Treatments on Average Number of Fruits per Plants of Cantaloupe .	61
9	Effect of Irrigation and Fertilization Treatments on average Weight of Cantaloupe Fruits.	63
10	Effect of Irrigation and Fertilization Treatments on average Flesh Thickness of Cantaloupe Fruits.	64
11	Effect of Irrigation and Fertilization Treatments on average Length of Cantaloupe Fruit .	64
12	Effect of Irrigation and Fertilization Treatments on average Diameter of Cantaloupe Fruits.	65
13	Effect of Irrigation and Fertilization Treatments on average Firmness of Cantaloupe Fruits.	67
14	Effect of Irrigation and Fertilization Treatments on average T.S.S.% of Cantaloupe Fruits.	67
15	Effect of Irrigation and Fertilization Treatments on average Total Sugars of Cantaloupe Fruits.	68
16	Irrigation water Use Efficiency (IWUE) and Nitrogen use Efficiency (NUE) of Cantaloupe Fruits.	70
17	Cost Analysis of Irrigation and Fertilization Treatments.	72

LIST OF FIGURES

No.	Title	Page
1	Typical Components of a Trickle Irrigation System (Schwankl and Hanson, 2007).	7
2	Layout of the Experiment Design of Irrigation System	32
3	Location at which Soil Samples were Collected for Determining both Soil Moisture and Salt Distribution.	40
4	Soil Moisture Distribution below the Lateral before Irrigation with the Treatment 60% of ET _c	49
5	Soil Moisture Distribution below the Lateral before Irrigation with the Treatment 80% of ET _c	49
6	Soil Moisture Distribution below the Lateral before Irrigation with the Treatment 100% of ET _c	49
7	Soil Moisture Distribution below the Lateral after Irrigation with the Treatment 60% of ET _c	49
8	Soil Moisture Distribution below the Lateral after Irrigation with the Treatment 80% of ET _c	49
9	Soil Moisture Distribution below the Lateral after Irrigation with the Treatment 100% of ET _c	49
10	Soil Water Distribution between Lines Just before Irrigation with 60 % of ET _c	50
11	Soil Water Distribution between Lines Just before Irrigation with 80 % of ET _c	50
12	Soil Water Distribution between Lines Just before Irrigation with 100 % of ET _c	50
13	Soil Water Distribution between Lines Just after Irrigation with 60 % of ET _c	50
14	Soil Water Distribution between Lines Just after Irrigation with 80% of ET _c	50
15	Soil Water Distribution between Lines Just after Irrigation with 100 % of ET _c	50

VI

16	Salt Distribution below the Lateral Just before Irrigation with 60 % of ETc under 50% of Recommended Fertilization Dose	54
17	Salt Distribution below the Lateral Just before Irrigation with 80% of ETc under 50% of Recommended Fertilization Dose	54
18	Salt Distribution below the Lateral Just before Irrigation with 100 % of ETc under 50% of Recommended Fertilization Dose	54
19	Salt Distribution below the Lateral Just after Irrigation with 60 % of ETc under 50% of Recommended Fertilization Dose	54
20	Salt Distribution below the Lateral Just after Irrigation with 80% of ETc under 50% of Recommended Fertilization Dose	54
21	. Salt Distribution below the Lateral Just after Irrigation with 100% of ETc under 50% of Recommended Fertilization Dose	54
22	Salt Distribution below the Lateral Just before Irrigation with 60 % of ETc under 100% of Recommended Fertilization Dose	55
23	Salt Distribution below the Lateral Just before Irrigation with 80% of ETc under 100% of Recommended Fertilization Dose	55
24	Salt Distribution below the Lateral Just before Irrigation with 100% of ETc under 100% of Recommended Fertilization Dose	55
25	Salt Distribution below the Lateral Just after Irrigation with 60 % of ETc under 100% of Recommended Fertilization Dose	55

VII

26	Salt Distribution below the Lateral Just after Irrigation with 80 % of ETc under 100% of Recommended Fertilization Dose	55
27	Salt Distribution below the Lateral Just after Irrigation with 100 % of ETc under 100% of Recommended Fertilization Dose	55
28	Salt Distribution between Lines Just before Irrigation with 60 % of ETc under 50 % of Recommended Fertilization Dose	58
29	Salt Distribution between Lines Just before Irrigation with 80 % of ETc under 50 % of Recommended Fertilization Dose	58
30	Salt Distribution between Lines Just before Irrigation with 100% of ETc under 50 % of Recommended Fertilization Dose	58
31	Salt Distribution between Lines Just after Irrigation with 60 % of ETc under 50 % of Recommended Fertilization Dose	58
32	Salt Distribution between Lines Just after Irrigation with 80 % of ETc under 50 % of Recommended Fertilization Dose	58
33	Salt Distribution between Lines Just after Irrigation with 100 % of ETc under 50 % of Recommended Fertilization Dose	58
34	Salt Distribution between Lines Just before Irrigation with 60 % of ETc under 100 % of Recommended Fertilization Dose	59
35	Salt Distribution between Lines Just before Irrigation with 80% of ETc under 100 % of Recommended Fertilization Dose	59
36	Salt Distribution between Lines Just before Irrigation with 100 % of ETc under 100 % of Recommended Fertilization Dose	59

VIII

37	Salt Distribution between Lines Just after Irrigation with 60 % of ET _c under 100 % of Recommended Fertilization Dose	59
38	Salt Distribution between Lines Just after Irrigation with 80% of ET _c under 100 % of Recommended Fertilization Dose	59
39	Salt Distribution between Lines Just after Irrigation with 100 % of ET _c under 100 % of Recommended Fertilization Dose	59
40	Effect of Irrigation and Fertilization Treatments on Total Yield of Cantaloupe Fruits.	60
41	Effect of Irrigation and Fertilization Treatments on Average Number of Fruits Per Plants of Cantaloupe .	62
42	Effect of Irrigation and Fertilization Treatments on Average Weight of Cantaloupe Fruits.	63
43	Effect of Irrigation and Fertilization Treatments on Average Flesh Thickness of Cantaloupe Fruits.	64
44	Effect of Irrigation and Fertilization Treatments on Average Length of Cantaloupe Fruits.	65
45	Effect of Irrigation and Fertilization Treatments on Average Diameter of Cantaloupe Fruits.	65
46	Effect of Irrigation and Fertilization Treatments on Average Firmness of Cantaloupe Fruits.	67
47	Effect of Irrigation and Fertilization Treatments on Average T.S.S.% of Cantaloupe Fruits.	68
48	Effect of Irrigation and Fertilization Treatments on Average Total Sugars of Cantaloupe Fruits.	68
49	Effect of Irrigation and Fertilization Treatments on Irrigation Water Use Efficiency (IWUE) of Cantaloupe Fruits.	70
50	Effect of Irrigation and Fertilization Treatments on Nitrogen Water Use Efficiency (NUE) of Cantaloupe Fruits.	71

1.INTRODUCTION

Cantaloupe is considered one of the most important vegetable crops in Egypt, which has the majority of exported productions to Europe. However, due to its sensitivity to water, irrigation scheduling should be linked with its ability to consume water, therefore, water requirement, must be estimated appropriately in accordance with plant wetted root zone (**Badr, 2007 and Badr & Abou Hussein, 2008**).

Nowadays determining the optimal crop water requirements is considered as one of the most important factors that affecting plant production, especially, with the scarcity of water resources under arid conditions of Libya and Egypt. This may be due to negative interrelation between the amount of water added and the ability of plant. Leaching irrigation water leads to rising field water table, which, leads to the ground water pollution with nutrients, especially, nitrates and yield reduction due to the disturbance in water balance in the root zone. Also, leaching of nutrients will affect plant production. While, over use of water will reduce water use efficiency. Moreover, utilization of extra amounts of fertilizers, will lead to water stress of plants and increase cost of production input, due to the increase in the cost of fertilizers, energy consumption for extra pumping among other factors .

Drought is the major environmental constraint to crop productivity. Consequently, it is necessary to study the physiological response of plants to drought stresses in order to develop appropriate strategies in order to carry on food production under adverse environmental conditions .

Estimating the exact crop water requirements is the suitable method for avoiding soil pollution by chemicals. and in turn protect soil ecosystem and saves water.